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المجلة الصحية لشرق المتوسط

EMHJ

Eastern Mediterranean Health Journal

La Revue de Santé de la Méditerranée orientale

Research ethics
Biomedical research, including research involving humans, has without doubt benefited human health significantly. However, people are not mannequins and the rights of all human research participants must be upheld by ensuring the highest standards of ethical conduct of research.

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المجلد الثامن عشر / عدد ٧
تموز / يوليو

المجلة الصحية لشرق المتوسط

هى المجلة الرسمية التى تصدر عن المكتب الإقليمى لشرق المتوسط بمنظمة الصحة العالمية. وهى منبر لتقديم السياسات والمبادرات الجديدة فى الخدمات الصحية والترويج لها، ولتبادل الآراء والمفاهيم والمعطيات الوبائية ونتائج الأبحاث وغير ذلك من المعلومات، وخاصة ما يتعلق منها بإقليم شرق المتوسط. وهى موجهة إلى كل أعضاء المهن الصحية، والكليات الطبية وسائر المعاهد التعليمية، وكذا المنظمات غير الحكومية المعنية، والمراكز المتعاونة مع منظمة الصحة العالمية والأفراد المهتمين بالصحة فى الإقليم وخارجه.

EASTERN MEDITERRANEAN HEALTH JOURNAL

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LA REVUE DE SANTÉ DE LA MÉDITERRANÉE ORIENTALE

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Contents

المجلة الصحية لشرق المتوسط

EMHJ

Letter from the Editor

Historically there was direction from Ancient Egyptian, Greek and Muslim scholars on physicians' obligations to their patients, all of which required avoidance of harm. However, such an imperative was not properly considered for experimentation involving humans until the middle of the 20th century, although such research has been increasingly conducted from the 18th century onwards. Thus ethics in relation to the use of human subjects in research is comparatively new. Nevertheless, there are now numerous ethics guidelines for research involving humans developed by international, regional and national organizations. Their common purpose is to protect the rights and safety of research participants by promoting ethical conduct of research. Central to such guidelines is that research requires ethical review and approval by a competent Research Ethics Committee and that participants must give their informed consent to take part. In 2011 WHO published *Standards and operational guidance for ethics review of health-related research with human participants* which provides updated guidance on the research ethics review process and aims to help those responsible for drafting national, local and institutional regulations and policies in relation to ethics review of health-related research involving humans.

Journals are in a position to ensure that the research that they publish adheres to such ethical guidelines, but how far do they do so? A paper from Saudi Arabia included in this issue assessed how often ethical conduct of human subject research was documented in studies published in Saudi Arabian medical journals between 1979 and 2007. The study found a low documentation rate suggesting editor's lack of rigor and/or investigators' ignorance of guidelines. However, after the year 2000 an ongoing improvement was found.

World Hepatitis Day is held each year on 28 July to raise awareness and understanding of viral hepatitis and the diseases it causes. Hepatitis B and C are growing threats in the Region: it is estimated that 4.3 million persons are infected with hepatitis B virus and 800 000 with hepatitis C virus each year.

Research published in this issue on hepatocellular cancer in Yemen found chronic hepatitis B and C virus infection were the most frequently identified risk factors. Needlestick injury (NSI) is a significant risk factor for bloodborne infections such as hepatitis B and C, and a study on interns and medical students in the Palestine Occupied Territories reports that over 40% of the participants had experienced at least 1 NSI but only 46.7% of the interns were immunized against hepatitis B.

رسالة من المحرر

حَفَلت كتابات قُدَامَى الأطباء المصريين، والإغريق، وأطباء الحضارة العربية الإسلامية بكثير من التوجيهات حول واجبات الأطباء تِلقاءَ مرضاهم، وجميعها تقضي بتجنب إلحاق أي ضرر أوْ ضِرار بالمرضى. ولكن هذه التعاليم لم تؤخذ بعين الاعتبار كما ينبغي في التجارب التي تُجرىَ على البشر حتى أواسط القرن العشرين، مع أن البحوث التي تتناول الإنسان قد بدأت تتزايد وتيرة إجرائها منذ القرن الثامن عشر. وبذلك تُعَدُّ أخلاقيات التعامل مع البشر في البحوث موضوعاً جديداً نسبياً؛ ولو أنّنا نجد أمامنا حالياً العديد من الدلائل الإرشادية التي أعدَّتها المنظمات الدولية والإقليمية والوطنية حول البحوث التي تتعامل مع البشر. والهدف المشترك لها هو حماية حقوق وسلامة هؤلاء المشاركين في البحوث الـمُجْراة، عن طريق تعزيز السلوكيات الأخلاقية في إجراء البحوث. وجَوْهَرُ هذه الدلائل الإرشادية أن أيّ بحث سيُجرَى على الإنسان يجب أن يخضع أولاً إلى مراجعة وموافقة مُسْبَقَة للجوانب الأخلاقية في البحث، من قِبَل لجنة مختصة بأخلاقيات البحوث، وإطلاع المشاركين في البحوث والحصول منهم على موافقة مستنيرة على مشاركتهم في البحث. وفي عام 2011 نشرَت منظمة الصحة العالمية المعايير والدليل العملي لمراجعة أخلاقيات البحوث التي تتعامل مع البشر وهي تعرض دليلاً حديثاً حول عملية مراجعة الأخلاقيات البحثية وتهدف إلى مساعدة المسؤولين على وضع مسوَّدة وطنية، ولوائح محلية ومؤسسية، وسياسات تتعلق بمراجعة أخلاقيات البحوث الصحية الـمُجْراة على البشر.

ويَسْتَتبع ذلك أن من واجب المجلات العلمية أن تتأكد من أن البحوث التي تنشرها تلتزم بمراعاة هذه الدلائل الإرشادية الأخلاقية. ولكن إلى أيٍّ مدىً يطبَّق ذلك بالفعل؟ لقد قيّمت ورقة علمية من المملكة العربية السعودية منشورة في هذا العدد مدى توثيق السلوكيات الأخلاقية المتَّبعة مع الأشخاص المدرجين في البحوث التي نشرتها المجلات الطبية السعودية خلال الفترة من 1979 حتى 2007. وقد اكتشفت الورقة أن معدل التوثيق كان منخفضاً مما يدل على عدم اهتمام الباحثين أو جهلهم بالدلائل الإرشادية. ولو أن الأمور بعد عام 2000 في تحسُّن مستمرّ.

وثـمَّة دراستان مهمّتان في هذا العدد بمناسبة الاحتفال السنوي بيوم التهاب الكبد العالمي في 28 تموز/ يوليو بُغيةَ الارتقاء بمستوى الوعي بالتهاب الكبد الفيروسي والأمراض التي تنجم عنه. ولا يخفَى أن التهاب الكبد "بي" و"سي" يمثّل تهديداً متفاقماً في الإقليم: حيث يصاب ما يقدر بـ 4.3 مليون شخص بفيروس التهاب الكبد "بي" و800 ألف شخص بفيروس التهاب الكبد "سي" سنوياً.

وقد كَشَفَ البحث المنشور في هذا العدد حول موضوع سرطان الخلايا الكبدية في اليمن أن العدوى بفيروسَيْ التهاب الكبد "بي" و"سي" هي أكثر عوامل الاختطار التي تم التعرف عليها تكراراً، وأن الإصابات الناجمة عن وخز الإبرة هي أهم عوامل اختطار عدوى الأمراض المنقولة بالدم مثل التهاب الكبد "بي" و"سي". وفي دراسة أجريَت على الأطباء المقيمين وطلبة كلية الطب في المناطق الفلسطينية المحتلة تبيَّن أن أكثر من 40٪ من المشاركين في الدراسة قد تعرّضوا لهذه الإصابات مرة واحدة على الأقل، ولكن لم يتم تمنيع سوى 46.7٪ فقط من الأطباء المقيمين ضد التهاب الكبد "بي".

Documentation of ethical conduct of human subject research published in Saudi medical journals

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توثيق السلوك الأخلاقي للبحوث على البشر المنشورة في المجلات الطبية السعودية

إيمان علي القاعي، محمد ماهر الحمامي، منال العيدان

الخلاصة: قد قيَّم الباحثون توثيق السلوك الأخلاقي (بحصولهم على موافقة مجلس المراجعة في المؤسسة، وموافقة المشاركين واتباع الدلائل الإرشادية الأخلاقية)، في دراسات البحوث على البشر التي نشرت في مجلات طبية سعودية بين عامي 1979 و2007. وقسم الباحثون الدراسات إلى دراسات استعادية، أو دراسات استقبالية غير تدخلية، أو دراسات تدخلية، أو دراسات مسح ومقابلات. وشملت الدراسة 1838 دراسة نشرت في 286 عدداً من 11 مجلة طبية سعودية، وكان 0.9٪ منها قد وُثِّق من حيث اتباعه للدلائل الإرشادية الأخلاقية، وتَبِعَهُ معدل مرتفع بمقدار يُعْتَد به للدراسات التي نشرت بعد عام 2000 (1.7٪). ومن بين 821 دراسة تطلبت موافقة مجلس المراجعة في المؤسسة، وثقت 8.6٪ منها حصولها على تلك الموافقة وعلى الموافقة المستنيرة للمشاركين، مع معدلات مرتفعة بمقدار يُعْتَد به للدراسات التدخلية (19.4٪) والدراسات بعد عام 2000 (19.7٪)، والدراسات التي أجريت خارج المملكة العربية السعودية (15.9٪). ويشير انخفاض معدل التوثيق إلى افتقار المحررين للدلائل الإرشادية الصارمة، أو جهل الباحثين لها، أو كليهما معاً. كما يشير ارتفاع معدل التوثيق بعد عام 2000 إلى تحسُّن متواصل.

ABSTRACT We evaluated the documentation of ethical conduct (obtaining institutional review board approval and consent and following ethical guidelines) of human subject research studies published in Saudi Arabian medical journals between 1979 and 2007. Studies were classified as retrospective, prospective non-interventional, interventional or survey/interview. Of 1838 studies published in 286 journal issues of 11 Saudi Arabian medical journals, only 0.9% documented the ethical guidelines followed, with a significantly higher rate for studies published after year 2000 (1.7%). Of 821 studies requiring institutional review board approval, 8.6% documented obtaining the approval and informed consent, with a significantly higher rate for interventional studies (19.4%), post-year 2000 studies (19.7%) and studies performed outside Saudi Arabia (15.9%). The low documentation rate suggests editor's lack of rigor and/or investigators' ignorance of guidelines. The higher documentation rate after year 2000 suggests an ongoing improvement.

Justification du respect des règles éthiques dans la conduite de recherches impliquant des personnes publiées dans des revues médicales saoudiennes

RÉSUMÉ Nous avons évalué les pièces à l'appui du respect de ces règles (obtention de l'approbation d'un comité d'examen institutionnel et d'un consentement, et observation des directives éthiques) dans la réalisation d'études de recherche impliquant des personnes publiées dans des revues médicales saoudiennes entre 1979 et 2007. Les études ont été classées selon leur type : rétrospectives, prospectives non interventionnelles, interventionnelles ou enquêtes/entretiens. Sur 1838 études publiées dans 286 numéros de 11 revues médicales saoudiennes, seules 0,9 % apportaient la justification du respect des directives éthiques. Ce taux est supérieur (1,7 %) pour les études publiées après 2000. Sur 821 recherches nécessitant l'approbation d'un comité d'examen institutionnel, 8,6 % disposaient de la documentation prouvant son obtention et de celle d'un consentement éclairé. Ce taux est nettement supérieur pour les études interventionnelles (19,4 %), les études postérieures à l'année 2000 (19,7 %), et celles menées hors de l'Arabie saoudite (15,9 %). Le faible taux d'études pouvant justifier le respect des règles éthiques suggère que le rédacteur manque de rigueur et/ou que les chercheurs ignorent les directives. La hausse du taux après l'année 2000 est le signe qu'une amélioration est en cours.

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Introduction

Investigators have a primary responsibility to safeguard the rights and welfare of subjects participating in research studies. This responsibility is shared by the institutions where the studies are conducted and the editors of the journals publishing the results [1]. The available means of protection of human subjects in research include obtaining informed consent and approval of the study proposal and consent form by an independent institutional review board (IRB) [1,2]. Written informed consent is the default standard for any research involving human subjects [1,2]. However, it can be waived by the IRB in well-defined circumstances [1]. Consent for publication is required when it is necessary to publish information that identifies individuals [1]. Ethical requirements to protect human subjects apply to a much broader range of research than many investigators may realize. For example, it applies to research that uses individually identifying private information even if the information was not specifically collected for the study in question, to research on bodily materials, cell lines or DNA samples that can be associated with an individual source even if the investigator him/herself did not collect these materials, and to research on left-over diagnostic specimens [1].

The International Committee of Medical Journal Editors (ICMJE) established its first guidelines for manuscript submission in 1978 [3]. Its 1981 edition required authors to indicate procurement of IRB approval [4], the 1991 edition added the requirement to indicate if informed consent was obtained [5] and the latest 2004 edition stated that authors should indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee and with the Helsinki Declaration [6]. While most international peer-reviewed journals subscribe to these guidelines [7], there is evidence that these guidelines are not universally followed [8–13].

There are 64 medical journals published in Saudi Arabia (scientific journals, bulletins and newsletters), of which 20 are in the English language [14]. The compliance of Saudi medical journals with ICMJE guidelines has not been studied before. We reviewed documentation of compliance with ethical guidelines in human subject research studies published in 11 Saudi medical journals between 1979 and 2007 and explored the factors associated with such documentation.

Methods

Sample

The sample was original research studies using human subjects published between 1979 and 2007 in 286 journal issues of 11 Saudi medical journals (Table 1), accessible electronically in full or available at the authors institution's medical library. A human subject was defined as an individual about whom an investigator obtains data through interventional or interaction with the individual or identifiable private information [1].

Procedure

Using a structured data collection tool, the research studies were classified into: retrospective studies (based on pre-existing medical records or biological samples), prospective non-interventional studies (based on medical records or biological samples), interventional studies, surveys or interviews. They were also classified into studies requiring both IRB approval and informed consent (interventional studies, prospective medical records or

Table 1 Medical journals in Saudi Arabia publishing in English language and reviewed for the present study (*n* = 1838)

Journal title (launch year)	Journal issues per year	Original studies per journal issue	Review period	Human subject research studies identified	
	No.	No.		No.	%
Annals of Saudi Medicine (1985)[a]	4 (before 1988) 6 (1988–)	6	1981–2007	339	18.4
Annals of Thoracic Medicine (2006)	2 (2006) 4 (2007–)	4	2006–07	23	1.3
Journal of Family and Community Medicine (1994)	2 (1994–99) 3 (2000–)	4	1997–2007	133	7.2
Journal of the Saudi Heart Association (1998)	2–3	5	1995–2007	53	2.9
Neurosciences (2000)	4	6	2000–07	141	7.7
Pan Arab Journal of Neurosurgery (1997)	2	3	1999–2001	6	0.3
Saudi Dental Journal (1989)	3	4–6	1984–2007	136	7.4
Saudi Journal of Anaesthesia (2007)	3	3	2007	9	0.5
Saudi Journal of Gastroenterology (1995)	3	6	2004–2007	40	2.2
Saudi Medical Journal (1979)	12	8–11	1979–2007	943	51.3
Saudi Pharmaceutical Journal (1993)	4	5	2003–06	15	0.8

[a] *From 1980–84 it was entitled KFSH&RC Medical Journal, in 1985 it became the Annals of Saudi Medicine.*

Table 2 Classification of identified human subject research studies according to study type and ethical documentation required

Type of study	Total		Information documented											
			Ethical guidelines used				IRB approval + informed consent required				IRB approval required				Publication consent required			
			Yes		No		Yes		No		Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Retrospective																		
Medical record	600	32.6	3	0.5	597	99.5	n/a	–	–	–	11	1.8	589	98.2	0	0.0	6	100.0
Biological sample	73	4.0	2	2.7	71	97.3	n/a	–	–	–	1	1.4	72	98.6	n/a	–	–	–
Prospective																		
Interventional	341	18.6	6	1.8	335	98.2	66	19.4	275	80.6	n/a	–	–	–	0	0.0	1	1000
Survey	279	15.2	1	0.3	278	99.6	n/a	–	–	–	8	2.9	271	971	n/a	–	–	–
Medical record	251	13.7	3	1.2	248	98.8	1	0.4	250	99.6	n/a	–	–	–	0	0.0	2	100.0
Biological sample	229	12.5	1	0.4	228	99.6	4	1.7	225	98.3	n/a	–	–	–	n/a	–	–	–
Interview	65	3.5	0	0.0	65	100.0	n/a	–	–	–	3	4.6	62	95.4	n/a	–	–	–
Total	1838	100.0	16	0.9	1822	99.1	71	8.6	750	91.4	23	2.3	994	97.7	0	0.0	9	100.0

IRB = institutional review board; n/a = not applicable.

biological samples-based studies) or studies requiring IRB approval only, in which informed consent could have been possibly waived by the IRB (retrospective medical records or biological samples-based studies, surveys and interviews).

The following information was also collected for each study: publication year, country where the study was performed (Saudi Arabia or other country), publication of individually identifying information (and documentation of consent to publish such information) and the presence of a statement about the ethical guidelines that were followed. Uncertainties about the classifications were resolved by discussion among the authors.

This study was reviewed and approved by the research ethics committee of the author's institution.

Statistical analysis

The data were analysed using *SPSS* for Windows, version 13.0. The chi-squared test was used to study associations. All reported *P*-values are 2-sided.

Results

We identified 1838 human subject research studies that were published in English between 1979 and 2007 in 286 journal issues of 11 Saudi medical journals (Table 1). There were 383 (20.9%) published from 1979–89, 612 (33.3%) from 1990–99, and 843 (45.9%) from 2000–07. Most (1369, 74.5%) were conducted in Saudi Arabia and 469 (25.5%) outside Saudi Arabia. One-third (673, 36.6%) were retrospective and 1165 (63.4%) were prospective.

Documentation of ethical guidelines followed

Only 16 (0.9%) of the 1838 studies reported the ethical guidelines that had been followed (Table 2). The type of study was not associated with the documentation rate ($P = 0.16$). There was a significant association, however, between documentation rate and year of publication (1.7% for studies published in 2000–07, 0.3% for studies published in 1990–99, and 0% for studies published in 1979–89) ($P = 0.003$) (Table 3). The location of study was not associated with the documentation rate ($P = 0.26$) (Table 3).

Studies requiring both IRB approval and informed consent

A total of 821 studies were judged to require both IRB approval and informed consent; 71 (8.6%) documented

Table 3 Classification of identified human subject research studies according to publication period, study location and ethical documentation required

Period/location	Total		Information documented											
			Ethical guidelines used				IRB approval + informed consent required				IRB approval required			
			Yes		No		Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Publication period														
1979-89	383	20.8	0	0.0	383	100.0	0	0.0	211	100.0	1	0.6	171	99.4
1990–99	612	33.3	2	0.3	610	99.7	4	1.5	266	98.5	1	0.3	341	99.7
2000–07	843	45.9	14	1.7	829	98.3	67	19.7	273	80.3	21	4.2	482	95.8
Study location														
Outside Saudi Arabia	469	25.5	6	1.3	463	100.0	40	15.9	211	84.1	8	3.7	210	96.3
Inside Saudi Arabia	1369	74.5	10	0.7	1259	92.0	31	5.4	539	94.6	15	1.9	784	98.1

IRB = institutional review board.

obtaining both. Documentation rate was associated with study type ($P < 0.001$, with the highest rate for interventional studies) (Table 2). It was also associated with year of publication (19.7% for 340 studies published in 2000–07, 1.5% for 270 studies published in 1990–99 and 0% for 211 studies published in 1979–89) ($P < 0.001$) and study location (15.9% for 251 studies conducted outside Saudi Arabia versus 5.4% for 570 studies conducted in Saudi Arabia) ($P < 0.001$) (Table 3).

Studies requiring IRB approval only

Out of 1017 studies that were judged to require IRB approval only 23 (2.3%) had documented obtaining it (Table 2). Documentation rate was not associated with study type ($P = 0.42$) (Table 2) or with location ($P = 0.12$) (Table 3). It was associated, however, with year of publication (4.2% for 503 studies published in 2000–07, 0.3% for 342 studies published in 1990–99 and 0.6% for 172 studies published in 1979–89) ($P < 0.001$) (Table 3).

Documentation of consent to publish

None of the 9 studies containing individually identifying information documented that they had obtained consent to publish.

Discussion

We found that the documentation rate of ethical conduct in human subject research studies published in Saudi medical journals was exceedingly low. Although the observed rate could be artificially low because of convenient sampling, inclusion of studies published since 1979 and a high percentage of non-interventional studies, we think that the true rate is low; the journals reviewed represent 55% of Saudi medical journals published in English, and the rate of documentation for IRB approval and informed consent remained low at 19.7% for studies published after 2000 and 19.4% for interventional studies. For comparison, the documentation rate of obtaining informed consent and IRB approval was 62% and 49% respectively for clinical trials published in 1993–94 in 4 Western gerontology journals [8], and 72.6% and 69.4% for clinical trials and other studies published in 3 Western journals of paediatrics in January to December 2000 [9]. A statement about IRB approval or informed consent was documented in 61% of child health studies of all designs (97% for clinical trials) published in 1999 [10]. Finally, the documentation rate of obtaining both informed consent and IRB approval was 64% for clinical trials published in 6 Western physiotherapy journals in 1996–2001 [11].

The low overall documentation rate could be due to failure to report (rather than obtain) IRB approval/informed consent, unavailability of an IRB at the investigator's institution or the investigators' ignorance about when IRB approval/informed consent are required. The later may explain the lower documentation rate for non-interventional studies and the higher documentation rate for studies conducted outside Saudi Arabia, which may be related to investigators' training or participation in multicentre or industry-sponsored studies. This issue was not explored in our study. Other potential causes include failure on the part of peer reviewers and journal editors due to lack of capacity or overload. The latter is unlikely given the reasonable number of research articles published per year.

We found a significant increase in the documentation rate after year 2000, consistent with previous studies [12,13]. The documentation rate of informed consent and IRB approval respectively was 74% and 69% before 1997, 82% and 82% after 1997 [12] and 87% and 93% in 2003 for articles on clinical trials published in 5 major

Western medical journals [13]. It is of note that a Saudi national research regulatory oversight system, the National Bioethics Committee, was established in 2001 [15].

In conclusion, the documentation rate of ethical conduct in human subject research studies published in Saudi medical journals was low, suggesting editors' lack of rigor and/or investigators' ignorance of guidelines. The lower documentation rate for non-interventional studies and for studies conducted in Saudi Arabia suggests unawareness of the scope of human subject research, whereas the higher documentation rate after year 2000 suggests an ongoing improvement.

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Research priorities in medical education in the Eastern Mediterranean Region

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أولويات البحوث في التعليم الطبي في إقليم شرق المتوسط

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الخلاصة: تمس الحاجة لتفعيل تحسين الجودة في بحوث التعليم الطبي في إقليم شرق المتوسط. وتهدف هذه الدراسة إلى التعرف على المواضيع الرئيسية، وإعداد قائمة الأولويات للبحوث في التعليم الطبي في إقليم شرق المتوسط. وقد استخدم الباحثون أسلوب المجموعة الاسمية التي تتألف من 30 خبيراً وضعوا قائمة بالمواضيع الرئيسية للبحوث في التعليم الطبي. وأجرى الباحثون جولتين من المسح بطريقة دلفي، فأرسلوا القائمة إلى 47 خبيراً في الإقليم، مع استبيان يتضمن أسئلة مفتوحة حول التغيير والإصلاح في التعليم الطبي. وفي القائمة النهائية التي تضمنت عشرين موضوعاً، كانت المواضيع الخمسة ذات الأولوية العُليا هي: تدريب الأطباء ليكونوا مدرسين فعالين، والنماذج الملبِّية لرغبات المجتمع لإعداد المناهج التعليمية، ونماذج التعليم السريري، والتعليم حول المهنية وحول الأخلاقيات، والتعليم حول الطب المسند بالبيِّنات. ويمكن للمواضيع التي تم التعرف عليها من خلال هذا المسح أن تساعد الباحثين في إقليم شرق المتوسط على التركيز على المجالات ذات الأولوية في بحوثهم.

ABSTRACT Ways are needed to effect quality improvement in medical education research in the Eastern Mediterranean Region (EMR). This study aimed to determine the principle themes and to draw up a list of priorities in medical education research in EMR. Using the nominal group technique with a group of 30 experts, a list of major themes in medical education research was prepared. In a 2-round Delphi survey the list was sent to another 47 experts in the Region with a questionnaire that included open questions about change and reform in medical education. In the final list of 20, the 5 highest priorities identified were: training physicians to be effective teachers; community-driven models for curriculum development; clinical teaching models; education about professionalism and ethics; and education for evidence-based medicine. Themes determined by this survey can help researchers in EMR to focus on priority areas in research.

Priorités de la recherche sur l'enseignement médical dans la Région de la Méditerranée orientale

RÉSUMÉ Il est nécessaire de déterminer comment améliorer la qualité de la recherche sur l'enseignement médical dans la Région de la Méditerranée orientale. Cette étude visait à dégager les principaux thèmes et à répertorier les priorités de la recherche sur l'enseignement médical dans cette Région. Selon la technique du groupe nominal, 30 experts ont dressé la liste des principaux thèmes de recherche en la matière. Au cours d'une enquête en deux phases selon la méthode Delphi, la liste a été envoyée à 47 autres experts de la Région avec un questionnaire comportant des questions ouvertes sur les réformes et les changements requis dans l'enseignement médical. Dans une liste finale de 20 éléments, cinq priorités essentielles ont été identifiées. Elles étaient les suivantes : formation des médecins pour devenir des enseignants efficaces ; création de modèles par la communauté pour l'élaboration des programmes ; établissement de modèles pour l'enseignement clinique ; enseignement du professionnalisme et de l'éthique ; et cours de médecine fondée sur les preuves. Les thèmes dégagés grâce à cette enquête permettront aux chercheurs de la Région de la Méditerranée orientale de se concentrer sur les domaines d'étude prioritaires.

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Introduction

Medical education research is a relatively young discipline, incorporating scientific principles from many domains, including the social sciences [1–4]. Some of the major challenges facing medical education research worldwide are methodological problems [5–11], financial concerns [12–14], lack of skilled educational researchers [15,16] and the lag between learning and measurable outcomes [17,18].

In addition to the general challenges in medical education research, the problems associated with performing such research in developing countries are profound. These include lack of financial resources, inadequate library and information resources, low socioeconomic indicators, cultural barriers, low numbers of expert researchers in the field, lack of relevance of medical education to community needs and a crisis of educational leadership in medical schools [19,20]. In addition there may be language barriers to publishing research [19]. The problems are reflected in the geographical distribution of publications in the field of medical education. One study showed that the journal *Academic Medicine* published articles from 25 countries between 1995 and 2000. However, authors from the United States of America (USA) and Canada generated 95% of all articles in the journal (an American journal). Authors from the United Kingdom (UK), Australia, USA, Canada and the Netherlands were responsible for 74% of all articles published in *Medical Education* (a UK journal) in the same period [21].

Today the medical education community worldwide is trying to find ways to effect quality improvement in medical education research. In view of the financial constraints in many Eastern Mediterranean Region (EMR) countries, setting research priorities seems to be a logical first step to carrying out research in medical education in a more cost-effective way [22]. This survey aimed to identify a list of priorities for medical education research in EMR countries.

Methods

Ethical approval for this project was obtained from the education ethics committee at the Shiraz Education Development and Research Centre. The study was carried out in 2 phases.

The first phase was a review of the literature on medical education research from EMR countries. A manual count was made of the number of articles published in journals in which the first author or corresponding author or their university affiliation were from EMR countries The 3 international peer-reviewed journals specializing in medical education that had the highest impact factors were searched—*Academic Medicine*, *Medical Education* and *Medical Teacher*. Papers from the abstract books of the Association for Medical Education in Europe (AMEE) conferences from 2001 to 2009 were included because AMEE organizes a well-known annual conference in the field of medical education.

The second phase used a 1-round nominal group technique session and a 2-round Delphi consensus survey to determine expert opinions about priorities for research in medical education in the EMR. The nominal group technique session [23] was used to identify a preliminary list of educational research needs. For this stage, 30 experts in medical education research from Iranian universities were invited to a workshop at the Education Development Centre at Shiraz University of Medical Sciences in Shiraz, Islamic Republic of Iran. The group leader clarified members' roles and group objectives with a statement of the importance of the task and of each member's contribution and an indication about how the group's output would be used. Participants were asked to think about "What are the priorities of medical education research?" and write down their responses in private. Then each participant was asked to express one idea at a time and his/her idea was written on the board without appraisal. In the next step each idea was fully discussed. Participants were encouraged to share their thoughts, and express their views about the pros and cons of each item. There was further explanation about each item so that everyone in the group had a full understanding of the concept. Duplications were identified and deleted. Then each member was asked to rank the top-10 items on a card by giving score 10 to the most important and score 1 to the least important. The average score was calculated for each item. At this stage all items that had received a rank were listed so that all participants could view them. The items were then ranked according to the average score. Further discussion and clarification of the ranked items was held by the facilitator to ensure that all participants had understood the meaning of each research priority. The 30 experts reviewed the rankings and a consensus was reached on the final list of 20 priorities and this was presented in a summary table.

For the Delphi survey a questionnaire was designed which incorporated the list of 20 proposed research priorities. In the first Delphi round the questionnaires were sent to 15 experts in the field of medical education field from EMR countries, contacted through 5 World Health Organization Collaborative Centres in EMR, and also to 32 managers of the education development and research centres at Iranian medical universities. The experts were asked: "What should be the main priorities in medical education research in our countries of the region?" They were asked to rank the list of research priorities from 0 (no priority), 1 (the lowest priority) to 10 (the highest priority). In the second Delphi round the returned questionnaires were analysed and mean

scores were calculated. Respondents whose scores were significantly different from the mean score of the whole group were asked to review their responses and reconsider their answers. Respondents could keep their initial ratings or change them, but they were asked to explain their decision in this regard. Respondents were allowed to mention other research priorities which they believed were important but which were not listed. The data were analysed using *SPSS*, version 14 software. Finally we prepared the final list of 20 areas of research ranked by perceived importance according to these experts.

Results

The literature review showed that from 2001 to 2009 only 22 papers from EMR countries were published in the 3 medical education journals analysed out of a total of 1580 articles published in *Medical Teacher*, 2494 articles in *Academic Medicine* journal and 2407 articles in *Medical Education* journal. A total of 375 abstracts were published in AMEE conference abstract books from EMR countries in the same period. The number of published abstracts from researchers in the 6 EMR countries with the most abstracts is shown in Figure 1. The highest number of published abstracts was from researchers from the Islamic Republic of Iran, peaking in 2005, but declining thereafter. There was a rising trend in abstracts from Pakistan and Saudi Arabia. The next most common contributing countries were United Arab Emirates, Lebanon and Egypt.

The final ranking of each research priority based on mean scores from the expert panels are shown on Table 1. The top 5 priorities identified (mean score ≥ 8.0) were: training physicians to be effective teachers; community-driven models for curriculum development; clinical teaching models; education about professionalism and ethics; and education for evidence-based medicine. In their responses to the open questions the experts were asked to suggest other priorities that were not listed. The most frequently mentioned priorities were: problem-based learning; peer-assisted learning; self-directed learning; and setting minimum standards to develop guidelines for accreditation.

Discussion

The aim of improving medical education is to train physicians to deliver better health care and therefore ultimately to achieve better health and quality of life for the population. Like every other science, improving the quality and vitality of medical education is dependent on applying the best evidence from good quality research in priority areas. Our survey showed that over the 9-year period studied only 22 papers from researchers in EMR countries were published in the 3 leading journals of medical education studied out of the total of 6481 published. The greatest number of published abstracts from AMEE conferences was from the Islamic Republic of Iran, followed by Pakistan and Saudi Arabia. Publishing a dedicated medical education journal in the EMR may act as a stimulus to publication in the region. Another problem the authors observe is that there is little or no collaboration between EMR countries and more developed countries outside the region in joint programmes of medical education research. Crew in 1988 and Bland in 2005

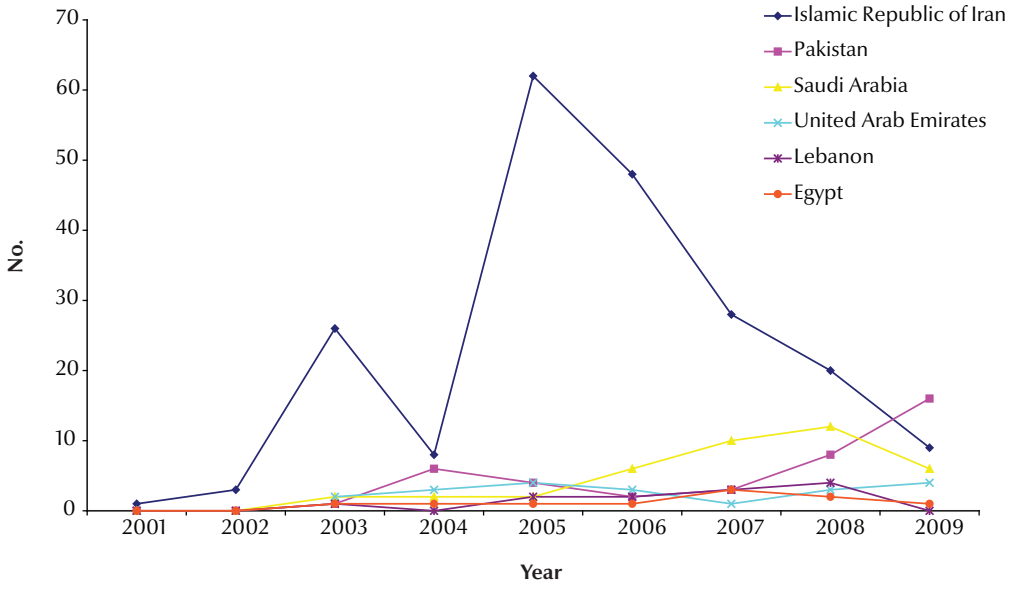

Figure 1 Abstracts published in the abstract books of the Association for Medical Education in Europe conferences from 6 Eastern Mediterranean Region countries (2001–2009)

Table 1 Medical education research priorities as identified by respondents to the questionnaire in the Delphi stage of the survey (*n* = 47)

Rank	Research priorities	Mean score[a] (SD)
1	Training physicians to be effective teachers	8.75 (1.50)
2	Community-driven models for curriculum development	8.50 (1.00)
3	Clinical teaching models	8.17 (1.65)
4	Education about professionalism and ethics	8.12 (2.03)
5	Education for evidence-based medicine	8.00 (1.57)
6	Effective methods of performance assessment	7.94 (1.98)
7	Educational evaluation, audit and accreditation	7.94 (1.68)
8	Education to decrease medical errors	7.89 (1.95)
9	Effective communication skills in teaching	7.80 (1.88)
10	E-learning in medical education	7.67 (1.77)
11	Medical education reform and innovations: facilitators and barriers to innovation and reform	7.63 (1.99)
12	Knowledge management in medical education	7.50 (1.50)
13	Integration of basic and clinical sciences in undergraduate medical training	7.49 (2.29)
14	Use of interdisciplinary approach to learning	7.46 (1.80)
15	Differences in medical education between Eastern Mediterranean countries	7.46 (1.82)
16	Educational management policies	7.37 (1.66)
17	Internet-based education	7.14 (1.91)
18	Resource allocation to medical education research	6.85 (2.06)
19	Economy and productivity in medical education	6.43 (2.25)
20	Cross-cultural education	5.23 (2.82)

[a] *Range 0–10.*
SD = standard deviation.

showed that collaborative activities are one of the most important factors in research productivity [24,25].

The results of the present priority-setting showed that the most important research priority in the region was considered to be "training physicians to be effective teachers". In most of the institutions in the EMR region the faculty members of medical schools and especially those responsible for clinical training of undergraduates are primarily employed in patient care. Having graduated from a well-known institution with a degree in a prestigious discipline, however, does not necessarily indicate a good ability for teaching. In the 1970s the theme "good teacher" referred to a faculty member who could communicate effectively and use various teaching aids [26]. In the 1980s, with a shift to student-centred strategies and self-directed learning, the role of the teacher shifted to a facilitator of student learning [27]. With the advent of outcome-based education and definition of competencies for medical students, 12 roles of the medical teacher, from clinical expert to role model and mentor were defined [28]. In 2001 a 3-circle model defined the criteria for an excellent clinical teacher: performance of task (doing the right thing), approach to task (doing the thing right) and professionalism (the right person doing it) [29]. Research involving the outcome of this process and student learning was included in this priority. By doing research in this field and providing suggestions on planning and implementation of effective faculty development programmes, we hope to provide insights into how effective faculty development activities solve some of the future challenges of medical education in EMR.

The second priority identified was "community-driven models for curriculum development". The gap between curricula designed by professional bodies and the needs of the community leads medical schools to find solutions that are based on the health needs of the community and prepare graduates for working in the community [30,31]. Besides community-oriented medical education, strategies such as socially accountable medical education are important [32]. The mission of every medical school is to educate doctors to meet the population's needs. Therefore, determining the community's needs and integrating these needs into the curriculum and comparing different community-driven models is necessary for each country.

The third priority identified was "clinical teaching models". Teaching in the

clinical environment is a complex and often difficult task. New models of teaching and learning in the clinical environment have been developed, such as general teaching models, the Stanford model, one-minute preceptor and the Dundee model [33]. Understanding these models and determining the best model for clinical teaching in the EMR is an important priority.

The fourth priority was "education about professionalism and ethics", an aspect of medical education that receives increasing emphasis [34]. Both teaching and assessment of ethics and professionalism are important.

The fifth priority was "education for evidence-based medicine". Teaching and learning using evidence-based medicine are hot topics in medical education today [35]. Teaching evidence-based medicine to undergraduate and postgraduate students and determining whether this approach actually changes learners' behaviour and leads to improved patient care is an essential priority in EMR countries.

The sixth priority was "effective methods of performance assessment". In recent years many countries have engaged in the process of performance assessment with the aim of protecting patients and enhancing the clinical performance of physicians [36]. Although a uniform approach to performance assessment in EMR is neither feasible nor desirable, a comparison of current practice in different countries in the region could lead to a better performance assessment process.

In the area of medical education, there are inevitably some similarities and differences in research priorities between countries. In the part of the study concerning open questions we obtained experts' opinion on other priorities that were not mentioned on the original list (drawn up by the consensus panel) but were important from their viewpoint. We found that many of the priorities were the same across countries. The most frequent topics mentioned were problem-based learning; peer-assisted learning; self-directed learning; and setting minimum standards for physicians working in EMR countries for accreditation programmes. We believe that the last topic can be merged with priority number 7 ("educational evaluation, audit and accreditation") and the first 3 priorities can be put under the topic "clinical teaching models" (priority number 3).

In another open question the experts were asked to give their opinions about changes, reform and innovation programmes in medical education research in EMR. They emphasized preparing a critical mass of specialists in medical education research and also stressed the importance of medical education research in universities. One of the experts recommended priority-setting, policy-making, human resource development, governance and knowledge transfer and suggested that research in medical education needs to use the "mission-aligned management and allocation" model. This term refers to a financial management model to assure resource allocation supports core mission-related activities. These include decisions about the sources and amount of funds to be used in the budgeting process and how to use the budget to support strategic priorities and new initiatives [37].

There were some limitations to this research. The study was based on experts' opinion and we could not use a needs assessment method. There were no comprehensive database of financial information, human resources and medical education programmes and research in EMR. The final list and analysis was based on the responses received and does not necessarily represent the opinion of all the experts in this field. It should also be kept in mind that the priorities in any field can change over time but the list of 20 items presented here might help extend the lifespan of this list of priority despite probable changes in the ranking of the items.

Summary & suggestions for future research

Between 2001 and 2009 a relatively small number of research articles about medical education were published in the leading international specialist journals of medical education by researchers in the EMR. It suggests that research in medical education, or at least its dissemination, is not well developed in the countries of EMR. Future research could look at factors that might hamper this important branch of medical research, such as lack of interest, poor knowledge of the areas of concern and the methodology, lack of awareness of its necessity, financial constraints and lack of support by the institutions themselves. Establishing a body to coordinate joint programmes in medical education research in the EMR may facilitate such research.

Although the list of research priorities in the field of medical education research presented here is not claimed to be a complete list, it does provide a useful starting point. Potential researchers need to be made aware of the most important problems in this field, the questions that should be answered and the priorities to be considered. This would help to guide them in choosing appropriate and relevant themes for research with practical and useful outcomes.

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Hepatocellular carcinoma in Yemeni patients: a single centre experience over an 8-year period

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سرطانة الخلية الكبدية في مرضى يمنيين: الخبرة المكتسبة في مركز وحيد على مدى 8 سنوات

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الخلاصة: أجرى الباحثون دراسة استعادية شملت جميع المرضى الذين قُبلوا في مستشفى الثورة التعليمي في صنعاء لإصابتهم بسرطانة الخلية الكبدية، بُغْيَة دراسة ملف المرض لدى المرضى اليمنيين والتعرف على عوامل الاختطار المحتملة. فخلال فترة الدراسة التي استمرت ثماني سنوات، من كانون الثاني/ يناير 2001 وحتى كانون الأول/ ديسمبر 2008، تم قبول 251 مريضاً ثبتت إصابتهم بسرطانة الخلية الكبدية. وقد جمع الباحثون المعطيات من سجلات المستشفيات، وكانت تتناول الخصائص الديموغرافية، والمظاهر السريرية، والسمات الهيستولوجية، والواسمات الفيروسية، والمعالجة، والنتائج. ووجدوا أن ما يقرب من 75٪ من المرضى هم من الذكور، وممن يتراوح مجال أعمارهم بين 26 و75 عاماً، (بوسطي مقداره 53.5 ± 13.9 عاماً)؛ وأن معظم المرضى من الفلاحين (73.7٪)، وأن لديهم سوابق تعرض للمواد الكيميائية، وكانت أكثر عوامل الاختطار التي تعرف عليها الباحثون تكراراً: العدوى بفيروس التهاب الكبد "بي" (48.2٪)، و"سي" (38.2٪). ولم يكن لمضغ القات ولا للتدخين أهمية يُعْتَد بها إحصائياً كعوامل اختطار. وكانت إصابة الفص الأيمن واضحة لدى 109 مرضى (43.4٪)، وظهرت آفات متعددة لدى 154 مريضاً (61.4٪). وتبيَّن أن 187 مريضاً (74٪) لديهم تشمع كبدي مترافق مع سرطانة الخلية الكبدية. وبلغ المعدل الإجمالي للوفيات في غضون ستة أشهر من القبول في المستشفى 24.3٪.

ABSTRACT We carried out a retrospective study of all patients admitted to Al-Thawra Teaching Hospital in Sana'a with hepatocellular carcinoma to study the disease profile in Yemeni patients and identify possible risk factors. During the 8-year study period, January 2001–December 2008, 251 patients were admitted with confirmed hepatocellular carcinoma. From hospital records we collected data on demographic characteristics, clinical manifestations, histological characters, viral markers, treatment and outcome. Around 75% of the patients were males. Age range was 26–75 years, mean 53.5 (SD 13.9) years. Most patients were farmers (73.7%) and had a history of chemical contact. Chronic hepatitis B virus infection (48.2 %) and hepatitis C virus infection (38.2%) were the most frequently identified risk factors. Qat chewing and smoking were not statistically significant risk factors. Right lobe involvement was seen in 109 (43.4%) patients and 154 (61.4%) presented with multiple lesions. We found 187 (74.0%) patients had cirrhotic liver associated with hepatocellular carcinoma. Overall mortality rate within 6 months of admission to hospital was 24.3%.

Carcinome hépatocellulaire chez des patients yéménites : étude monocentrique sur huit ans

RÉSUMÉ Nous avons mené une étude rétrospective de tous les dossiers des patients admis au centre hospitalier universitaire Al-Thawra de Sanaa pour un carcinome hépatocellulaire, afin d'identifier le profil pathologique chez des patients yéménites et les facteurs de risque possibles. Pendant les huit années de l'étude, de janvier 2001 à décembre 2008, 251 patients ont été admis pour un carcinome hépatocellulaire confirmé. Nous avons recueilli des données sur les caractéristiques démographiques et histologiques, les manifestations cliniques, les marqueurs viraux, les traitements et les résultats. Environ 75 % des patients étaient de sexe masculin. L'âge des patients allait de 26 ans à 75 ans. L'âge moyen était de 53,5 ans (E.T. 13,9). La plupart des patients étaient agriculteurs (73,7 %) et avaient des antécédents de contact avec des produits chimiques. Les facteurs de risque les plus fréquemment identifiés étaient une infection chronique par les virus de l'hépatite B (48,2 %) et de l'hépatite C (38,2 %). La mastication de khat et le tabagisme n'étaient pas des facteur de risque statistiquement importants. Le lobe droit était atteint chez 109 patients (43,4 %), et 154 d'entre eux (61,4 %) présentaient des lésions multiples. Nous avons observé que 187 patients (74,0 %) souffraient d'un foie cirrhotique concomitant d'un carcinome hépatocellulaire. Le taux de mortalité global à six mois de l'admission à l'hôpital était de 24,3 %.

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Introduction

Hepatocellular carcinoma (HCC) is the third most common cause of cancer mortality in the world. It accounts for over half a million deaths per year [1]. More than 80% of these occur in the developing countries [1]. The incidence rate of liver cancer varies widely from 52.1 per 100 000 population in China to 5.1 per 100 000 population in Northern Europe, depending on the geographical location and to exposure to viral etiology [1]. In the Middle East HCC is reported to account for about 4.7%–7.3% of patients with chronic liver disease. [2]. A report from Yemen indicated that hepatocellular carcinoma was the most common gastrointestinal tumour, representing 38.66% of all gastrointestinal malignancy [3].

The epidemiology of HCC is characterized by marked demographic and geographic variations. There are great regional differences in the pathology and epidemiology. The variation is greatly influenced by the etiology of the disease. [4]. The main recognized risk factors for HCC development are aflatoxin B1 ingestion and chronic viral hepatitis B and C infection; these are associated with over 80% of HCC worldwide [4]. Schistosomiasis, a regional risk factor, has not proven to be a risk factor for HCC development [5]. Exposure to exogenous chemicals, such as insecticides, pesticides and chlorination by-products in drinking water, have been reported to be fundamental sources for hepatocarcinogenesis [6].

In a 2006 study, HCC developed in 70%–90% of cirrhotic patients, while only 10% of HCC patients have a non-cirrhotic liver, nor even have inflammatory lesions [7]. Epidemiologic data from neighbouring countries differ widely with regard to primary risk factors. It has been attributed to hepatitis C virus (HCV) infection in Saudi Arabia [8,9], hepatitis B virus/hepatitis D virus (HBV/HDV) infection in Jordan [10] and HBV and HCV in Turkey [11,12].

Studies on HCC in Yemen are few, and are not documented in the local or international literature. This study is the first comprehensive study to elucidate HCC in Yemen**.** Our aim was to determine the profile of hepatocellular carcinoma in Yemeni patients and to identify possible risk factors.

Methods

The study was conducted at Al-Thawra Teaching Hospital, a teaching and referral hospital providing special care for patients from the whole of Yemen. Over a period of 8 years, January 2001–December 2008, a total of 435 patients were admitted into hospital with suspicion of HCC on a clinical basis. Only 251 of these fulfilled the inclusion criteria, any 1 of: abnormal liver morphology with a tumour nodule on ultrasonography or on computer tomography (CT) scan or magnetic resonance imaging (MRI); elevated α-fetoprotein level (> 400 ng/mL) in the presence of a liver nodule; biopsy-proven HCC.

Data about patients were collected from hospital records, reviewed and organized according to the following:

- sociodemographic characteristics including: age, sex, occupation, residence (urban or rural), specific habits (e.g. use of qat or shama);
- history of exposure to risk factors of viral hepatitis such as blood transfusion, schistosomiasis and personal habits;
- clinical data: symptoms, and signs, diagnostic tools and clinical staging;
- laboratory findings: haematological status, liver function tests, renal function tests;
- radiological data: site of the tumour, multiplicity of lesions, tumour burden, abdominal metastases by abdominal ultrasound and/or CT scan and chest metastases by chest X-ray;
- pathological data: tumour grading, histological classification, tumour markers and association of liver cirrhosis;
- pattern of serological markers: α-fetoprotein level, schistosomiasis serology, hepatitis B surface antigen (HBsAg), and HCV antibodies (HCV-Ab);
- mortality while hospitalized (hospital stay ranged from 1 week to 6 months.

HCV-Ab was detected using second generation ELISA (Boehringer Mannheim Immunodiagnostics for ES-300). HBsAg was confirmed by ELISA test (Abbot Laboratories), and α-fetoprotein level was tested using the method of Abbot Laboratories.

Diagnosis of HCC was based on histopathological examination and/or detection of hepatic focal lesions by 2 imaging techniques (ultrasonography and dynamic CT) plus α-fetoprotein level ≥ 200 ng/mL.

Statistical data

All data were statistically analysed using *SPSS*, version 13. We used the χ^2 test to detect significant associations between proportions. A univariate model was used to determine the impact of the various risk factors on HCC. The independent factors were age, sex, history of blood transfusion, schistosomiasis, HCV-Ab, HBsAg positivity, occupation and personal habits. A *P*-value of < 0.05 was considered to indicate statistical significance**.**

Results

During the 8 years covered by our study, 251 patients were admitted to the hospital and confirmed as having HCC. Cirrhosis coexisted with HCC in 187 patients, 64 patients were coded as non-cirrhotic HCC. The majority of the patients (189) were males (75.3%) (Table 1), giving a male to female ratio of 3.05:1. ($\chi^2 = 24$, $P = 0.001$).

Table 1 shows the characteristic of patients with HCC. Age ranged from 26

Table 1 Sociodemographic characteristic and serological markers of patients (*n* = 251) with hepatocellular carcinoma admitted to Al-Thawra Teaching Hospital during 2001–2008

Characteristic	No.	%
Age (years)		
21–40	45	17.3
41–60	123	49.0
61–80	83	33.1
Sex		
Male	189	75.3
Female	63	24.7
Residence		
Rural	200	79.7
Urban	51	20.3
Occupation		
Farmer	185	73.7
Builder	31	12.3
Housewife	20	8.0
Other	15	6.0
Habit[a]		
Qat chewing	231	92.0
Smoking	189	75.3
Tobacco chewing (*shama*)	95	21.9
Risk factor		
Blood transfusion	30	12.0
Hepatitis B infection	121	48.2
Hepatitis C infection	96	38.2
Schistosomiasis	88	35.0
Dual infection[b]	6	2.4
α-fetoprotein (> 200 ng/mL)	112	44.6

[a] *Each patient had ≥ 2 habits.*
[b] *Dual infection: hepatitis B + hepatitis C.*

to 75 years with a mean of 53.5 [standard deviation (SD) 13.9] years. Almost half the patients were aged 41–60 years. The majority of the patients 203 (80.9%) came from rural areas. The patients were grouped according to their occupation into 4 groups as shown in Table 1. It is clear that most cases 185 (73.7%) were farmers who gave a history of chemical contact (insecticides/pesticides/fertilizers), only 66 (26.3%) patients were not farmers.

Clinical finding in patients

The majority of patients (98%) presented with frequent abdominal pain, followed by hepatomegaly (94%) and abdominal mass (61.0%); other manifestations are shown in Table 2.

Characteristic features

The majority of the patients, 109 (43.4%) had right lobe involvement and 154 (61.3%) presented with multiple lesions. The size of the single focal lesion was > 10 cm in 61 (62.9%) patients, 5–10 cm in 23 (23.7%) and only 13 (13.5%) had a lesion < 5 cm (Table 3).

Histopathological study

Tissue specimens for histopathological examination were obtained for 217 (86.4%) patients: 153 (70.6%) through percutaneous true-cut biopsy, open biopsy in 35 (16.1%) and fine needle aspiration in 29 (13.3%). However, in 34 (13.6%) patients the diagnosis was established by high serum α-fetoprotein besides the malignant character of the tumour via ultrasonography, CT scan or MRI.

Histopathological types found in our cases were trebecular (47.2%), mixed (22.12%), acinar (11.52%), pseudopapillar (10.6%) and fibrolamellar (9.22%).

Risk factors and personal habits

The risk factors and personal habits of our patients with HCC are illustrated in Tables 1 and 4. Most of our patients 217 had hepatitis virus infection .Virus markers were negative in only 13.5% of the patients and this was more obvious in non-cirrhotic cases. HBsAg positive cases accounted for 121 (48.2%) cases and 96 (38.2%) were HCV Ab positive. HCV-Ab-positive cases were at double risk, while HBsAg had almost triple the risk of developing HCC. Double infection (HBsAg and HCV Ab) was found in only 6 patients. Occupation (being a farmer) was also significantly associated with HCC ($P = 0.01$) (Table 4).

Residents of rural areas, patients with previous history of schistosomiasis and/or blood transfusion were not significantly associated with HCC in the univariate analysis (Table 4).

Qat chewers accounted for 92.0% of the patients and smokers 75.3%. Chewing tobacco (*shama* user) was reported in 21.9%; only a few patients reported that they consumed alcohol and only in small amounts. Schistosoma serology was positive in 91 (36.2%) patients. There was no statistically significant difference between cirrhotic and non-cirrhotic patients with HCC regarding the above risk factors (Table 4). Serum α-fetoprotein level was greater than 200 ng/mL in 44.6% of the patients.

The patients with HCC who did not have cirrhosis were younger than those

Table 2 Clinical presentation of patients (*n* = 251) with hepatocellular carcinoma admitted to Al-Thawra Teaching Hospital during 2001–2008

Clinical finding at presentation	No.	%
Abdominal pain	246	98.0
Hepatomegaly	236	94.0
Abdominal mass	153	61.0
Jaundice	85	33.9
Ascites	81	32.3
Splenomegaly	78	31.1
Weight loss	58	23.1
Pruritus	57	22.7
Lower limb oedema	49	19.5
Haematemesis/melena	35	13.9
Anorexia	35	13.9
Shrunken liver	25	10.0
Chest pain/cough	19	7.7

with cirrhosis, but the difference was not statistically significant ($P < 0.05$) (Table 4).

Treatment and outcome of patients with HCC

Tumour eligibility-for-treatment criteria in our hospital are: single nodule of < 5 cm without evidence of vascular invasion, or less than 3 nodules < 3 cm each with the absence of portal vein thrombosis.

Tumours > 5 cm in diameter were not considered eligible for any other curative treatment such as liver transplantation, percutaneous ethanol ablation, or radio frequency ablation. In any case, these types of therapy are not available in Yemen.

The majority of our patients with HCC 146 (58.2%) were given chemotherapy in the form of doxorubicin and tamoxifen. Another 68 (27.1%) received supportive therapy only because of the advanced nature of the disease and general deteriorated condition. Surgery was performed for 6 (2.4%) patients (Table 5). We had no further information on treatment regime or outcome for the 31 (12.4%) patients who were sent abroad for treatment. The overall mortality rate within 6 months of admission to hospital was 24.3%. We were not able to follow up for more than 6 months. This was mainly due to the fact that the majority of patients lived in rural areas where there are no local medical facilities. Coming to our hospital for follow-up was difficult for them for financial reasons. Additionally, many of the patients are illiterate and they are not aware about the disease; they do not take the medical advice seriously and do not attend for follow-up.

Table 3 Characteristic features of hepatocellular carcinoma in 251 patients admitted to Al-Thawra Teaching Hospital during 2001–2008

Characteristic feature	No.	%
Lesions		
Unifocal (single)	97	38.6
Multifocal (multiple)	154	61.4
Site of lesion		
Right lobe	109	43.4
Left lobe	67	26.7
Both	75	29.9
Size of single lesion (n = 97)		
< 5.0 cm	13	13.5
≥ 5.0 cm	84	86.5
Metastases (n = 164)		
Intra-abdominal	72	74.0
Chest	47	28.7
Lymph node	45	27.4
Portal vein thrombosis	32	12.7

Discussion

Worldwide, HCC is one of the most common malignancies associated with poor prognosis. [13]. The magnitude of the problem of HCC in Yemenis has not been explored yet. There has been a remarkable increase of the proportion of HCC among Yemenis over the last 8 years [2,14] compared with the period before 2000, when HCC was rarely diagnosed [15]. Similar results have been reported from Egypt, Canada and the United States of America [16–18] .This rise in rates may be a result of the increasing risk factors such as the emergence of HCV, the contribution of HBV infection, exposure of the population to carcinogens such as industrial chemicals and insecticides, pesticides and fertilizers, which are used in agriculture without any governmental control. Moreover, the improvement in the diagnostic tools for HCC will affect the rates and the increased survival rate among patients with cirrhosis may allow time for developing HCC [19].

In this study HCC was about 3 times more prevalent in men than in women: as has been shown consistently in other studies, incidence in males was considerably greater than for females;

Table 4 Univariate analysis of hepatocellular carcinoma risk factors among patients with hepatocellular carcinoma, with (*n* = 187) and without (*n* = 64) cirrhosis, admitted to Al-Thawra Teaching Hospital during 2001–2008

Risk factor	All	With cirrhosis	Without cirrhosis	*P*-value
	No.	No.	No.	
Age (years)				
< 60	168	132	36	0.045
≥ 60	83	55	28	
Sex				
Male	189	149	40	0.007
Female	62	38	24	
HBsAg				
Positive	121	101	20	0.002
Negative	130	86	44	
HCV-Ab				
Positive	96	80	16	0.015
Negative	155	107	48	
Occupation				
Farmer	185	130	55	0.01
Non farmer	66	57	9	
Schistosoma				
Positive	91	72	19	0.23
Negative	160	115	45	
Qat chewer				
Positive	231	170	61	0.30
Negative	20	17	3	
Shama user				
Positive	88	62	26	0.45
Negative	163	125	38	

HBsAg = hepatitis B surface antigen; HCV-Ab = hepatitis C virus antibody.

this is obvious in cirrhotic patients with HCC. Worldwide however, the highest male:female ratio was in the Asian Pacific region, where chronic HBV infection is endemic [20]. In Japan men were at 4.35 times greater risk of developing HCC than women. The reasons for the disparity are obscure, but may include environmental factors such as a higher prevalence of persistent HBV or HCV infection, alcohol abuse, Qat chewing and smoking in men than in women [20]. Genetic and hormonal factors may also be important [21–23]. It has been speculated that estrogens and androgens could modulate hepatocarcinogenesis and explain the higher incidence of HCC in men [3].

The prevalence of HCC occurring in a younger age group compared to the western population [24] suggests an early exposure to carcinogenic factors in Yemeni patients.

This study presents a number of findings that are different from others that have previously addressed HCC in the Middle East region. We found that the Qat chewer and *shama* user had higher prevalence of HCC than other groups and hepatoma occurred in relatively younger patients .These 2 risk factors have not been addressed before and may have carcinogenic effects that enhance occurrence of HCC.

The most notable finding of this study, however, was that the majority of our patients presented with multiple liver focal lesions and mostly with right lobe involvement. Single focal lesions were > 5 cm in most patients. Portal vein thrombosis was present in 12.7% of cases: these findings indicate that the HCC patients in our study presented late, which may be a result of low level of awareness about HCC and its inherent dangers in the general population as a whole. The high poverty level in the population is another strong factor responsible for the late presentation as most would probably have visited the herbalists or religious homes (where treatment is based on religious faith) before ending up in the hospital. Valuable time would have been lost in the process.

Table 5 Treatment regimen and outcome for patients with hepatocellular carcinoma admitted to Al-Thawra Teaching Hospital during 2001–2008

Treatment	Total		Survived	
	No.	%	No.	%
Chemotherapy	146	58.1	118	80.8
Supportive only	68	27.1	42	61.7
Sent abroad	31	12.4	25	80.6
Surgery	6	2.4	5	83.3
Total	251	100	190	75.7

Other risk factors in this study which have significant role in developing HCC were older age and being a farmer. This is in concordance with the findings of other studies done in Egypt. [2,25] and Malaysia.[26]. It may be related to prolonged exposure to carcinogenic substances in the environment [25].

Histopathologically, the trabecular type was the most commonly encountered variety. This finding is similar to that noted by most other workers; the trabecular type being reported to be the most common type and constituting 60%–75% of HCC [24].

HBV is considered an important carcinogen via integration and promotion of random mutation [27]. The prevalence of HBV in our patients was 48.2%. The prevalence of HBsAg carriers among the general Yemeni population varied from 12% to 20% [28]; these patients were at significantly risk of developing HCC. Case–control studies have demonstrated that chronic HBV carriers have a 5–fold increased risk of HCC compared with the general population [16]. The prevalence of HCV antibodies in our patients was 36.3%. This etiological pattern is strikingly different from that of Europe and Egypt where HCV is the main cause of HCC. These differences may be related to the low prevalence of HCV infection among the general population in Yemen, range 2%–4% [27].

HCV has been shown to be implicated in the development of HCC in countries with intermediate or low incidence of HBsAg positivity [29]. The possible role of HCV in liver carcinogenesis is through cirrhosis. This is supported by the lack of reverse transcriptase in HCV and absence of integration of HCV genome into cellular genome [29]. Recently, a direct role has been noted for HCV in hepatocarcinogenesis: it is now believed that the core component of HCV may directly participate in hepatocarcinogenesis [27].

It was surprisingly that the proportion of patients with negative viral markers in this study is higher than in Egypt [2]. But is similar to that in the United States of America, where El-Serag reported that 14.5% of patients with HCC remain without specific risk factors and are diagnosed with nonspecific cirrhosis. This could be explained by the development of mutant or occult viral infections or exposure to other risk factors such as aflatoxins and heavy smoking. In addition to these, the Yemeni population is exposed to other risk factors which may lead to chronic liver disease such as schistosomiasis. This induces immune suppression, which could result in increased persistence viraemia following acute infection of both hepatitis B and C [30].

It is likely that HCC will continue to rise in the next few decades. Therefore, further studies to assess the magnitude and risk factors of HCC in Yemen and other developing countries seem warranted.

Conclusion

Both HBV and HCV are considered risk factors for HCC occurrence with the greater role of HBV in Yemeni patients.

Our study produced important preliminary insights that can be used to develop more refined, prospective analyses of HCC risk in Yemen.

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Needlestick injury among interns and medical students in the Occupied Palestinian Territory

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الإصابات بوخز الإبرة لدى الأطباء المقيمين وطَلَبة الطب في الأرض الفلسطينية المحتلة

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الخلاصة: هدفت هذه الدراسة إلى التعرف على معدل انتشار الإصابات الناجمة عن وخز الإبرة لدى الأطباء المقيمين وطَلَبة الطب، إلى جانب معارفهم ومواقفهم والاستراتيجيات الوقائية التي يتبعونها إزاء التعرض للعوامل المسببة للأمراض المنقولة بالدم. وقد أجرى الباحثون دراسة مستعرضة شملت 272 مشاركاً استكملوا استبياناً يملأ ذاتياً، وتبين أن ما يزيد على 40٪ من المشاركين قد عانوا من وخزة إبرة واحدة على الأقل. وكان خياطة الجروح أكثر الأسباب شيوعاً للإصابة (33.5٪)، وكان أعلى معدلات الوقوع في غرفة الطوارئ (55.5٪)، وسجل الفشل في الإبلاغ عن الإصابة إلى المسؤول الصحي في 48.6٪ من الإصابات، ولم يَتَلَقَّ اللقاح المضاد للالتهاب الكبدي "بي"، أكثر من 46.7٪ من المقيمين، حيث إن معظم الطلبة (76.8٪) قد استكملوا جدول لقاحاتهم (P> 0.001). وتبين للباحثين أن المشاركين معرضون لزيادة في اختطار الإصابة بوخز الإبرة والعدوى المنقولة بالدم.

ABSTRACT The aim of this study was to determine the prevalence of needlestick injury (NSI) among interns and medical students as well as their knowledge of, attitude towards and their protective strategies against exposure to bloodborne pathogens. A cross-sectional study was conducted among 272 participants using a self-administered questionnaire. Just over 40% of the participants had experienced at least 1 NSI. Wound suturing was the most common cause of injury (33.5%), and the highest incidence (55.5%) was in the emergency room. Failure to report the injury to health representatives was recorded for 48.6% of NSIs. Only 46.7% of the interns had received the hepatitis B vaccine whereas most of the students (76.8%) had completed their vaccination schedule (P < 0.001). Participants were found to be at a high risk of NSIs and bloodborne infections.

Blessures par piqûre d'aiguille chez les internes et les étudiants en médecine en Territoire palestinien occupé

RÉSUMÉ L'objectif de la présente étude était de déterminer la prévalence des blessures par piqûre d'aiguille chez les internes et les étudiants en médecine ainsi que les connaissances, les attitudes et les stratégies de protection contre l'exposition à des agents pathogènes à transmission hématogène. Une étude transversale a été menée auprès de 272 participants au moyen d'un auto-questionnaire. Un peu plus de 40 % des participants avaient été blessés au moins une fois par piqûre d'aiguille. La cause la plus fréquente de ces blessures (33,5 %) était la suture des plaies, alors que l'incidence la plus forte était observée dans les services des urgences (55,5 %). Dans 48,6 % des cas, la blessure n'avait pas été notifiée aux responsables sanitaires. Seuls 46,7 % des internes avaient reçu le vaccin contre l'hépatite B, mais la plupart des étudiants (76,8 %) étaient à jour dans leurs vaccinations (P < 0,001). Les résultats de l'étude indiquent que les participants sont confrontés à un haut risque de blessures par piqûre d'aiguille et d'infections hématogènes.

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Introduction

One of the most serious threats health-care workers face during their clinical practice is the possibility of exposure to deadly viruses. They are exposed to preventable injuries involving over 20 different bloodborne pathogens resulting in about 1000 infections per year, of which the most common are hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) [1]. Accidental needlestick injuries (NSI) are an occupational hazard for health-care workers: more than 100 000 injuries are reported in hospitals in the United Kingdom annually [2] and 600 000–800 000 in the United States of America. However, at least half of all such injuries are believed to go unreported [3,4]. According to the World Health Organization, 16 000 cases of Hepatitis C, 66 000 cases of Hepatitis B and 1000 cases of HIV may have occurred worldwide in the year 2000 among health-care workers through exposure to NSIs [5].

In the last few years, worldwide statistics on needlestick injuries have become more precise; several benchmark numbers are lower than previously thought [3]. Despite this, NSI remains one of the hidden problems for health-care workers in some countries, including Palestine, where it is also very prevalent [6–8]. A study done in Canada has shown that 70% of nurses, 47% of technicians, 78% of residents and 74% of laboratory technicians were exposed to the dangers of NSI [9].

In November 2002, *World Health Report* data indicated that 2.5% of HIV and 40% of hepatitis B and C cases among health-care workers worldwide were the result of occupational exposure [10].

Hepatitis B is the most important infectious occupational hazard for health-care workers and medical students in the Occupied Palestinian Territory since it is situated in area of intermediate endemicity for HBV carriers [11], while the Gaza Strip is considered an endemic area [12]. For HBV, the risk of pathogen transmission with a sharp object has been estimated to be 6%–30%; for HCV it is 5%–10% and for HIV 0.3% [13–15]. Post-exposure prophylaxis is shown to be effective in 75% to over 90% of cases for HBV; for HIV, the risk of infection is reduced. So far, there is still no known means of preventing HCV acquisition following NSI [13].

The emotional impact of an NSI can be severe and long-lasting, even when a serious infection is not transmitted. Yet the problem of exposure to contaminated blood among health-care workers, especially interns and medical students, has received inadequate attention in the Occupied Palestinian Territory.

The aim of this study was to determine the prevalence and selected determinants of NSIs among interns and medical students in the Occupied Palestinian Territory as well as their knowledge, attitude and protective strategies used against exposure to bloodborne pathogens. We conducted this study with the hypothesis of a high prevalence of NSI among interns and medical students owing to lack of knowledge and carelessness.

Methods

In this cross-sectional study, the participants comprised 137 interns working in 9 hospitals in 6 governorates in the Occupied Palestinian Territory and 135 medical students enrolled in the 3 Palestinian medical schools (Al-Quds, Annajah and Al-Azhar) (58 from 5th year and 77 from 6th year) during their clinical practice (Table I). We targeted all interns and medical students during their clinical practice. Response rate was (272/339) 80%. Students on sick leave, or travelling during the study period were excluded.

Anonymous, self-administered questionnaires were distributed among the participants over a period of 2 months (February and March, 2009). Medical students who were not in their clinical practice distributed the questionnaire and explained the objectives of the study to the participants. They then collected all the questionnaires and sent them back to the main researcher, who was responsible for the coding and data entry. The participants (the 3 groups) were asked to recall all their past experiences of needlestick injuries (NSI) and the surrounding circumstances since the start of their clinical practice. This was 4 years for the interns (starting from the fourth year in medical school), 3 years for sixth year students and 2 years for fifth year students.. Questions pertaining to self-perceived cause of injury and knowledge of bloodborne diseases, NSI reporting and personal protection, assuming the availability of protective measures, were also asked.

The questionnaire was designed based on several studies and questions propounded in various references [3,5,6] and it was piloted on 11 randomly selected individuals (6 medical students in Al-Quds University, and 5 interns from 2 hospitals; none of whom was included in the study sample) and the questions were modified accordingly.

In this study NSI was defined as an injury caused by a sharp instrument, including, but not limited to, needles, scalpels and contaminated broken glass, which are potentially contaminated with the body fluid of another person [16]. Cases of NSI were respondents who had had at least 1 experience of NSI; the number of injuries they experienced was also counted.

The data were analysed using *SPSS*, version 15; the associations between the dependent variable (NSI) and the selected independent variables were tested using the chi-squared test for categorical variables with alpha set at 5%.

Results

A total of 272 questionnaires (of 339) were completed, 137 (50.4%) were interns (response rate 84%), 77 (28.3%) were 6th year and 58 (21.3%) were 5th year medical students (overall response rate 77 % for medical students). The overall response rate was 80.2%.Mean age was 24.8 (standard deviation = 2.75) years: 56.2% of the participants were male and 43.8% female.

Since the beginning of their clinical practice, 41.2% of all respondents had experienced at least 1 NSI: 57.7% of the interns, 28.6% of 6th year and 19.0% of 5th year medical students (Table 1).

The relation between education level (intern versus medical student) and NSIs was statistically significant ($P \leq 0.001$) (Table 1), as opposed to sex: prevalence of NSI among male students was 24.2% compared to 25.8% for female students ($P = 0.83$), and 52.4% among male interns compared to 65.2% for female interns ($P = 0.16$). The results show that 34.2% (38) of the injured participants had had 1 NSI, 37% (41) had had 2, 13.5% (15) had had 3, and 15.3% (17) had had more than 3.

Of the 239 injuries recalled, cause was reported for 179 cases (Table 2). Wound suturing was specifically cited as the cause of injury in 60 cases (33.5%). Injury during intramuscular injection accounted for 20.7%, followed by recapping needles (18.4%). The habit of recapping used needles was reported by 71.6% (192) of the respondents.

The highest incidence of NSIs was found in the emergency room (55.5%), followed by obstetrics (15.0%) and surgery wards (9.6%) (Table 2).

The most common post-exposure action taken by the injured personnel was washing and disinfection with povidone iodine solution (63.1%), followed by only washing the site of injury (16.2%); 7.2% did nothing after being exposed to NSI.

Almost 50% of all NSIs were not reported to occupational health departments, mostly because the injured person did not know to whom or to where the injuries should be reported (29.5%), or did not know it should be reported (27.7%) (Table 3). Interns (37.3%) were statistically significantly less likely to report needlestick injuries than medical students (66.0%) ($P < 0.01$).

Of those who did not experience NSI during their clinical practice, 37.9% of the interns and 70.6% of the medical students believed this was because they did few procedures, whereas 33.8% of all the participants cited extreme care to be the reason for not being injured.

The majority of respondents did not routinely use gloves when administering intramuscular (77.0%) or intravenous (59.7%) medications, or during intravenous cannulation (57.3%) (Table 4). Gloves are commonly worn for inspecting wounds (89.2%), and almost always for wound suturing (95.9%). Glove usage did not vary with education level: usage by interns, and 5th and 6th year medical students was similar.

Additionally, 53.2% of the participants did not use the double glove technique because they believed that wearing 2 gloves decreases hand sensation (31.6%). Some believed that the double glove technique does not increase protection (25.7%); others just followed the example of other health professionals who did not wear double gloves (22.8%) (Table 5). The relationship between wearing 2 gloves and education level was not statistically significant ($P = 0.09$).

Most of the participants (87.0%) reported that they always used sharps containers to dispose of needles as 19.4% practiced recapping sometimes or rarely and only 9.0% never recap needles. In addition, eye protection was not used routinely by the majority (97.0%) of the participants.

Only 64 interns (46.7%) had received the hepatitis B vaccine while 81.6% of 6th-year medical students and

Table 1 Distribution of participants and rates of needlestick injuries (NSIs)

Participants	No.	NSIs	
		No.	%
Interns			
Tulkarem	13	10	76.9
Nablus	23	14	60.9
Ramallah	20	13	65
Jerusalem	15	8	53.3
Hebron	35	20	57.1
Gaza	31	14	45.2
Total	137	79	57.7
5th year medical students			
Al-Quds SoM	27	3	11.1
Al-Azhar SoM	13	3	23
Annajah SoM	18	5	27.8
Total	58	11	19
6th year medical students			
Al-Quds SoM	33	8	24.2
Al-Azhar SoM	25	7	28
Annajah SoM	19	7	36.8
Total	77	22	28.6

SoM = School of Medicine.

Table 2 Reported cause and location (department) where needlestick injury occurred

Variable	Occurrence of injury							
	Interns		6th year students		5th year students		Total	
	No.	%	No.	%	No.	%	No.	%
Cause of injury[a]								
Wound suturing	43	33.6	12	35.3	5	29.4	60	33.5
IM drug injection	27	21.1	8	23.5	2	11.8	37	20.7
Recapping needles	24	18.7	5	14.7	4	23.5	33	18.4
Insertion of IV cannula	11	8.6	4	11.8	4	23.5	19	10.7
IV drugs or venesection	11	8.6	4	11.8	1	5.9	16	8.9
Arterial blood for ABG	3	2.3	0	0	1	5.9	4	2.2
Subcutaneous injection	2	1.6	0	0	0	0	2	1.1
Other	7	5.5	1	2.9	0	0	8	4.5
Total	128	100.0	34	100.0	17	100.0	179	100.0
Location								
Emergency room	59	54.6	13	50	9	75.1	81	55.5
Obstetrics department	15	13.9	6	23.1	1	8.3	22	15
Surgery department	12	11.1	1	3.8	1	8.3	14	9.6
Operating room	5	4.6	4	15.4	0	0	9	6.2
Outpatient clinic	7	6.5	0	0.0	0	0.0	7	4.8
Department of Internal Medicine	6	5.6	0	0.0	0	0.0	6	4.1
Patients' room	3	2.8	2	7.7	1	8.3	6	4.1
CCU/ICU	1	0.9	0	0.0	0	0.0	1	0.7
Total	108	100.0	26	100.0	12	100.0	146	100.0

[a]*Missing data: cause was not reported for 60 injuries.*
IM = intramuscular: IV = intravenous: ABG = arterial blood gases; CCU = cardiac care unit; ICU = intensive care unit.

71.9% of 5th-year medical students had completed their vaccination process ($P < 0.001$); the remaining 53.1% of interns and 23.2% of medical students had not started (18.9%) or had not completed (19.3%) the vaccination process. The reasons included being already positive to HBV antibodies, being busy on the day of the vaccination, or simply forgetting; others claimed that it is the responsibility of health authorities to arrange and announce for the vaccination programmes. The relationship between receiving the hepatitis B vaccine and education level was statistically significant ($P = 0.006$).

The majority of the participants (76.3%) said they had acquired knowledge of bloodborne diseases mainly through formal lectures in their medical schools and 23% from books.

In our study, 51.5% of the participants considered their level of knowledge of what should be done after exposure to NSI to be insufficient. Only 34.2% stated they had learnt the proper way of performing medical procedures in medical school, while 43.5% did so from observing other health-care workers.

Discussion

The results of our study are in agreement with the results of a study on medical students in France, where 24% had at least 1 experience of NSI, Wound suturing accounted for 58% of these injuries [17]. In a Washington study, 30% of medical students had at least 1 experience of NSI and most of the injuries occurred in the operating room [7]. In addition, most of the students (61.9%) in a Taiwan study had NSI, and the majority of the injuries occurred in patient's rooms [8].

This is also in agreement with a study from New York (27% of students had at least 1 NSI) [18], and with the studies by Norsayani and Noor Hassim [6], Abu-Gad and Al-Turki [19] and Jepsen and Smith [20] in which the frequency of injury in medical students was reported at 22.0%–35.5%. Other studies on medical students have reported 51.9%–83% for NSI [15].

One of the main factors causing different numbers of NSI cases may be the definition in different studies. In many studies, injuries from all types of sharp pointed instruments were under consideration; however, in others only hollow-needle instruments were taken into account. The general definition we followed in our study will give a higher percentage compared to the specific definition used in other studies.

In our study, the most common reason for not reporting NSIs was the lack

Table 3 Reasons needlestick injury was not reported

Reason for not reporting	Interns		6th year students		5th year students		Total	
	No.	%	No.	%	No.	%	No.	%
Do not know to whom or where it should be reported	21	28.4	9	36.0	3	23.1	33	29.5
Do not know it should be reported	18	24.3	6	24.0	7	53.8	31	27.7
Believe reporting would not influence the outcome	21	28.4	7	28.0	1	7.7	29	25.9
Forgot	14	18.9	3	12.0	2	15.4	19	17.0
Total	74	100.0	25	100.0	13	100.0	112	100.0

of knowledge to whom or where injuries should be reported and lack of knowledge that all injuries had to be reported. Here we have 2 points to discuss: first the preparation of medical students and how to protect themselves. i.e. a criticism of the curricula used in medical universities. Second, internal hospital regulations should be explained to students and interns before they get in contact with patients. This needs to be discussed with the relevant authorities to make it applicable for all health-care workers in the Occupied Palestinian Territories.

One other important issue is that about a quarter of the respondents believed that reporting was not important and would not influence the outcome. This is serious since it indicates that those respondents are not careful enough about their health and so don't care about protective measures. This might lead to other malpractices, which may affect patients' health in addition to their own.

The observed high level of underreporting suggests that the students' need for education on prevention, and especially on the importance of reporting all NSIs and the possibility of prophylaxis after exposure to bloodborne pathogens [8,13,14], because when a health-care worker suffers a needlestick injury, not only is he/she exposed to the risk of disease, but so are his/her future patients. In order to safeguard patients, it is imperative that interns and medical students report NSIs.

The rates for glove use were similar to rates previously demonstrated in North America [9,16,21]. Whitby and McLaws found that 43% of health-care workers always wore gloves when venesecting [21]; this was 40.3% in our study. In a study on French medical students, 91% always wore gloves during wound suturing [17]; in our study, the great majority of interns and medical students did appear to wear gloves for wound suturing (95.9%) and/or inspection (89.2%), where the risk of contamination with body fluids is high.

The most common department in which the participants had the experience of an NSI was the emergency department, followed by the obstetrics and surgical departments, mostly during wound suturing, intramuscular injection and recapping needles. In a French study, it was reported that most of the injuries (58%) took place while suturing wounds [17], while recapping needles was the commonest cause of injury in some other studies [9,21]. The gynaecology ward, the emergency room and the surgery ward have also been reported as being common departments for NSIs [6,22]. Recapping of used needles was a common practice among interns and medical students in our sample, despite specific guidelines laid down by the health authorities.

The present study showed that 53.3% of interns, 18.4% of 6th-year medical students and 28.1% of 5th-year medical students were not vaccinated against hepatitis B. In a 2001 Danish study of 406 medical students, 34% were not vaccinated against hepatitis B [20].

We found that 50% of the interns and 56.4% of medical students did not use the double glove technique because of decreased hand sensation and lack of belief in its benefits. This is in agreement with a study on medical students in Strasburg, in which 50% did not use 2 gloves because of the decrease in sensation and lack of belief in the benefits [23]. Norsayani and Noor Hassimalso found 75% of physicians stated they did not us 2 gloves, despite being aware of

Table 4 Participants' usage of gloves during 5 common procedures

Type of procedure	Interns		6th year students		5th year students		Total	
	No.	%	No.	%	No.	%	No.	%
IM injection	29	21.3	18	23.4	15	26.8	62	23.0
IV injection	57	41.9	28	36.8	23	41.1	108	40.3
IV cannula insertion	65	47.8	28	37.3	21	37.5	114	42.7
Wound inspection	123	90.4	65	85.5	51	91.1	139	89.2
Wound suturing	131	96.3	71	93.4	55	98.2	257	95.9

IM = intramuscular; IV = intravenous.

Table 5 Reasons participants did not routinely wear double gloves

Reason	Interns		6th year students		5th year students		Total (%)	
	No.	%	No.	%	No.	%	No.	%
Decreased hand sensation	18	28.2	14	35.0	11	34.3	43	31.6
Belief that double gloving did not increase protection	21	32.8	7	17.5	7	21.9	35	25.7
Follow other HCW who did not wear double gloves	14	21.9	9	22.5	8	25.0	31	22.8
Inadequate facilities	4	6.3	6	15.0	3	9.4	13	9.6
Other	7	10.8	4	10.0	3	9.4	14	10.3
Total	64	100.0	40	100.0	32	100.0	136	100.0

HCW = health-care worker.

the benefits [6]. Our study showed only 3.0% of the respondents using eye protection which is similar to the results in another study on medical students in which only 2.5% used eye protection in the operating theatre or the emergency room [22].

A study on medical undergraduates showed that 67.4% of the students recapping needles after use were not aware of the correct practice and were just following the example of other health workers [24]. We found that 74.3% of interns and 70.6% of medical students always recap needles.

The reliability of the reported rate of needlestick injuries in our study is limited by the differential recall ability of the respondents. However, it is reasonable to assume a fairly accurate recall since a needlestick injury is usually a painful experience [25].

Conclusion

NSIs are common among interns and medical students in the Occupied Palestinian Territory, particularly among interns, who most likely have a greater workload and may therefore be at greater risk. Therefore, preventive measures should be taken into consideration by the relevant authorities and universities. Also, focusing on the importance of reporting an NSI and the possibility of prophylactic measures seems necessary. Setting up an NSI management centre in hospital wards and follow-up of the injured individuals are recommended.

On the other hand, adherence to the universal precautions of using gloves and disposing of sharps was not optimal, especially among interns, suggesting a need to educate them more carefully on safe practices and the need for setting up postgraduate training courses on occupational risk management.

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WHO best practices for injections and related procedures toolkit

Medical treatment is intended to save life and improve health, and all health workers have a responsibility to prevent transmission of health-care associated infections. Adherence to safe injection practices and related infection control is part of that responsibility – it protects patients and health workers.

The above-mentioned toolkit covers elements of standard precautions relevant to the transmission of bloodborne pathogens through unsafe injection practices in health-care settings. The document will help to increase health workers' awareness of the importance of standard precautions relevant to injection safety.

The main areas covered by the toolkit are: bloodborne pathogens transmitted through unsafe injection practices; relevant elements of standard precautions and associated barrier protection; best injection and related infection prevention and control practices; occupational risk factors and their management.

This document is available at: http://www.who.int/injection_safety/toolbox/9789241599252/en/index.html

Cross-sectional study of frequency and factors associated with stethoscope cleaning among medical practitioners in Pakistan

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دراسة مستعرضة حول تواتر تنظيف سماعة الطبيب والعوامل المرتبطة به لدى الأطباء الممارسين في باكستان

عمر حيدر

الخلاصة: يغلب أن تستعمر الجراثيم حجاب سماعة الطبيب. وتصف هذه الدراسة المستعرضة تواتر الإبلاغ عن تنظيف سماعة الطبيب والعوامل المرتبطة به لدى 408 من طلاب الطب والأطباء في إحدى كليات الطب، وفي مستشفيَيْن تعليميَّيْن في راولبندي في باكستان. فقد أبلغت أقلِّية من المستجيبين للدراسة (37.7٪) أنهم لم ينظفوا سماعاتهم الطبية من قبل مطلقاً. وبعد الاستخدام السريري المعتاد، كانت الطريقة التي أبلغ عن أنها الأكثر شيوعاً لتنظيف السماعة الطبية هي مسحها بقماش جاف (35.2٪)، أما بعد تلوث حجاب السماعة الطبية بالدم أو بالمفرزات، فقد كانت أكثر طرق تنظيفها شيوعاً بمِسحات كحولية (64.3٪) ولدى التحليل المتعدد المتغيرات والوحيد المتغير، كانت العوامل الأكثر ارتباطاً بعدم تنظيف السماعة الطبية هي: سوابق تلقي معلومات حول تنظيف السماعة، واستخدام سماعة شخصية لآخر مرة، والارتباط بقسم الأمراض الداخلية. وينبغي إجراء المزيد من البحوث من أجل تحسين ممارسات تنظيف السماعات الطبية، لاستكشاف التدخلات التي تستهدف العاملين في الرعاية الصحية.

ABSTRACT Stethoscope diaphragms are frequently colonized by bacteria. This cross-sectional study described the frequency and factors associated with reporting ever cleaning stethoscopes among 408 medical students and doctors at a medical college and 2 teaching hospitals in Rawalpindi, Pakistan. A minority of the respondents (37.7%) reported having ever cleaned their stethoscope. Following normal clinical use, wiping with a dry cloth was the most frequently reported method of cleaning (53.2%). After contamination of the diaphragm with blood or secretions, cleaning with an alcoholic swab was the most common method (64.3%). In univariate and multivariate analyses, history of receiving information on stethoscope cleaning, utilization of personal stethoscope at last use and affiliation with internal medicine department were factors strongly associated with ever cleaning of stethoscope. Future research for improving stethoscope cleaning practices should explore educational interventions aimed at health care professionals.

Étude transversale de la fréquence de nettoyage des stéthoscopes et des facteurs associés au nettoyage par les praticiens au Pakistan

RÉSUMÉ Le pavillon des stéthoscopes est fréquemment colonisé par des bactéries. La présente étude transversale décrit la fréquence de nettoyage des stéthoscopes et les facteurs qui y sont associés par 408 étudiants et médecins de la faculté de médecine et de deux centres hospitaliers universitaires de Rawalpindi (Pakistan). Une minorité de répondants (37,7 %) affirmaient avoir déjà nettoyé leur stéthoscope. Après une utilisation clinique classique, l'utilisation d'un chiffon sec était la méthode de nettoyage la plus fréquemment rapportée (53,2 %). Après la contamination du pavillon par du sang ou des sécrétions, le nettoyage avec un tampon d'alcool était la méthode la plus répandue (64,3 %). Des analyses univariées et multivariées des résultats ont montré que le fait d'avoir reçu des informations sur le nettoyage du stéthoscope, l'utilisation d'un stéthoscope personnel lors de la dernière utilisation et l'affiliation à un service de médecine interne étaient des facteurs fortement associés à la pratique du nettoyage de l'instrument. Des recherches ultérieures devraient étudier la mise en œuvre d'interventions de formation destinées aux professionnels de santé afin d'améliorer les pratiques de nettoyage des stéthoscopes.

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Introduction

The stethoscope is a commonly used tool in clinical practice. Bacteria can be cultured from the diaphragms of the majority of stethoscopes in clinical use and can be as innocuous as normal skin flora or as potentially deadly as methicillin-resistant *Staphylococcus aureus* (MRSA) [1]. Regular cleaning of stethoscopes with alcohol-based disinfectants can reduce the presence of harmful bacteria on diaphragms, thus reducing the potential for nosocomial infection [2,3]. Studies from developed countries have shown that a majority of doctors do not clean or disinfect their stethoscopes on a regular basis [1–3].

Although developing countries have the highest burdens of communicable diseases, limited information is available on cleaning practices used by physicians for their stethoscopes. Africa-Purino et al. reported that none of the physicians or medical students working at the infectious ward at their university hospital in Manila, Philippines, reported daily or even weekly cleaning of their stethoscopes [4]. Lower pathogenic bacterial colony counts have been noted on samples cultured from the diaphragms of personal stethoscopes when compared with colony counts from communal stethoscopes [5]. It is not know whether receiving information on cleaning and disinfection affects doctors' cleaning preferences. No studies have specifically explored clinical factors associated with stethoscope cleaning practices either in developing or developed countries.

This aim of this cross-sectional study was to describes the frequency and factors associated with self-reported ever cleaning of stethoscopes among medical students and physicians at a medical college and two teaching hospitals in Rawalpindi, Pakistan.

Methods

Setting and sample

The study was carried out in May and June 2010. The hospitals, with a combined bed strength of 1350, serve as primary care as well as specialist referral centres. Lists of the physicians working at the hospitals were obtained. All doctors on duty at the departments of general surgery, internal medicine, gynaecology and obstetrics, paediatrics, radiology and pathology were contacted in person, and given the pre-tested questionnaire which was collected 1 hour later. Investigators visited the hospitals during office hours for 3 consecutive days to contact physicians who had not been available on previous day(s). From a listed combined departmental strength of 344, a total of 328 physicians (95.3%) were provided with the questionnaire. Another group of 231 5th-year medical students of Rawalpindi Medical College who attended clinical clerkships at these hospitals, were given the questionnaire during a lecture, to be completed and collected after 1 hour. Fully complete questionnaires were returned by 73.2% (240/328) physicians and 72.7% (168/231) medical students, for a total of 408 respondents. Ethical approval for the study was granted by the research oversight authority of Rawalpindi Medical College and allied teaching hospitals.

Data collection

The variables recorded in the questionnaire were sex of the respondent, departmental affiliation or medical student, regular or irregular use of stethoscope, utilization of personal or communal (ward) stethoscope at the last use, history of ever receiving information or advice regarding cleaning or disinfection of their stethoscope and whether they had ever cleaned their stethoscope or not. Those reporting ever having cleaned their stethoscope(s) were asked about the frequency of cleaning and methods of cleaning following normal clinical usage and following contamination of the stethoscope with blood or bodily secretions from patients.

Data analysis

The data were managed and analysed using *SPSS*, version 16. The choice of factors for exploration of associations was based on previous studies reporting factors associated with positive bacterial culture results from doctors' stethoscopes [1–6]. Odds ratios (OR) and 95% confidence intervals (CI) for univariate analysis were calculated using logistic regression. $P < 0.05$ was considered statistically significant. Significantly different variables were included as explanatory variables in the multivariate logistic regression model, with cleaning of stethoscope (ever/never) as the response variable.

Results

Use of a stethoscope on a daily basis was reported by 59.8% respondents (244/408), while all others had used a stethoscope at least once during the last month. Regarding ownership of the stethoscope they used the last time, 89.0% (363/408) utilized their personal stethoscope, while the rest had used a communal (ward) stethoscope. Only 17 respondents (4.2%) had ever received information or advice regarding cleaning or disinfection of their stethoscope.

Only 154 respondents (37.7%) reported having ever cleaned their stethoscope diaphragm. Among these respondents, regular cleaning was reported by 38 (24.7%), while the rest did it on an irregular basis (Table 1). Among those who reported ever cleaning their stethoscope, the favoured method of cleaning following normal clinical use was with a dry cloth (53.2%). After contamination with blood or body fluids 64.3% used alcohol swabs (Table 2).

Table 1 Frequency of cleaning stethoscope diaphragm by physicians and medical students

Frequency of cleaning	No.	% of ever cleaned (n = 154)	% of total (n = 408)
Regular cleaning	38	24.7	9.3
After every patient	0	0.0	0.0
Daily	19	12.3	4.7
Weekly	10	6.5	2.5
Monthly	4	2.6	1.0
Yearly	5	3.2	1.2
Irregular cleaning	116	75.3	28.4
Weekly	30	19.5	7.4
Monthly	60	38.9	14.7
Yearly	14	9.1	3.4
Once every few years	12	7.8	2.9
Total (ever cleaned)	154	100.0	37.7

Univariate analysis found statistically significant associations between ever cleaning of stethoscope and receiving any information on cleaning of stethoscopes (OR = 4.21, 95% CI: 1.45–12.19), regular use of stethoscope (OR = 2.47, 95% CI: 1.60–3.79), personal stethoscope utilized at last use (OR = 3.06, 95% CI: 1.44–6.51) and affiliation with the department of internal medicine (OR = 3.50, 95% CI: 1.93–6.36). No association was noted between sex and reporting ever cleaning of stethoscopes.

On multivariate logistic regression analysis, receiving information on cleaning (OR = 3.34, 95% CI: 1.45–12.19), use of personal stethoscope at last utilization (OR = 3.38, 95% CI: 1.24 – 9.20), affiliation with medicine (OR = 2.27, 95% CI: 1.10–4.67), and affiliation with radiology or pathology (OR = 2.78, 95% CI 1.11–6.97) were independently associated with ever cleaning of stethoscope (all $P < 0.05$) (Table 3).

Discussion

This study found that less than 40% of doctors and medical students had ever cleaned their stethoscope diaphragm. Wiping with a dry cloth was the most frequently used method. Having received information about cleaning of stethoscopes showed the strongest association with reporting ever cleaning a stethoscope.

This was the first study specifically exploring factors associated with cleaning of stethoscopes in Pakistan. Moreover, it was also the largest study on stethoscope cleaning from a developing country with a high burden of communicable diseases. The study was restricted to one medical college and two of its affiliated teaching hospitals, thus generalizability to all medical settings in developing countries would be limited. However, the findings regarding the reported frequency of cleaning of stethoscopes are similar to those noted from another developing country [4] and also from developed countries [1–3]. Although a previous study in the Philippines by Africa-Purino et al. reported a low frequency of regular cleaning [4], the present study used a larger sample size (408 versus only 30), covered multiple medical specialties and presented factors associated with ever cleaning of stethoscopes. The findings of the present study extend those from previous studies and are useful for establishing stethoscope cleaning guidelines in medical settings in developing countries.

It has been shown that after a day of not disinfecting a stethoscope in regular clinical use, contaminating bacteria can be cultured from the stethoscope diaphragm and the number of colony forming units increases daily [3,7]. It was noted that less than 5% of all respondents in the present study cleaned stethoscopes regularly on a daily basis. Although this frequency was higher than the study by Africa-Purino et al., in which none of the doctors or medical clerks reported cleaning stethoscopes on a regular daily or even weekly basis [4], it is still very low considering the risk of cross-infection posed by contaminated stethoscopes.

The use of cleaning agents among those who had ever cleaned their stethoscopes was disappointing. Following normal clinical use, the most popular method of cleaning was with a dry cloth. It is doubtful that wiping with a dry cloth would have a major effect on the level of contamination of the diaphragm. Ethyl alcohol has been shown to be a good disinfectant, while soap is also

Table 2 Methods of cleaning stethoscope diaphragm by physicians and medical students who reported they ever cleaned it (n = 154)

Method of cleaning	After normal clinical use		If contaminated with blood or body fluids	
	No.	%	No.	%
Alcohol swab	53	34.4	99	64.3
Soap and water	6	3.9	18	11.7
Plain water	8	5.2	15	9.7
Dry cloth	82	53.2	18	11.7
Other method	5	3.2	4	2.6

Table 3 Univariate and multivariate analysis of characteristics of physicians and medical students who reported the ever cleaned their stethoscope diaphragms

Characteristic	Total	Ever cleaned	*P*-value[a]	Unadjusted OR (95% CI)	*P*-value[b]	Adjusted OR (95% CI)[c]
	No.	%				
Received information on cleaning						
Yes	17	70.6	0.008	4.21 (1.45–12.19)	0.033	3.34 (1.10–10.10)
No	391	36.3		Ref.		Ref.
Regular use of stethoscope						
Yes	244	45.9	< 0.001	2.47 (1.60–3.79)	0.105	1.56 (0.91–2.68)
No	164	25.6		Ref.		Ref.
Last used stethoscope						
Personal	363	40.8	0.009	3.06 (1.44–6.51)	0.017	3.38 (1.24–9.20)
Communal	45	13.3		Ref.		Ref.
Physician's sex						
Male	189	38.1	0.892	1.03 (0.79–1.31)	–	–
Female	219	37.4		Ref.		
Department/affiliation						
Medicine	67	52.2	< 0.001	3.50 (1.93–6.36)	0.025	2.27 (1.10–4.67)
Surgery	82	42.7	0.012	2.38 (1.36–4.19)	0.172	1.67 (0.80–3.46)
Paediatrics	34	50.0	0.072	2.35 (0.99–5.52)	0.171	1.88 (0.76–4.66)
Obstetrics/ gynaecology	26	42.3	0.002	3.20 (1.50–6.84)	0.351	1.62 (0.59–4.43)
Radiology/ pathology	31	51.6	0.003	3.41 (1.55–7.51)	0.029	2.78 (1.11–6.97)
Medical student	168	23.8		Ref.		Ref.

[a]P-value for univariate analysis; [b]P-value for multivariate analysis; [c]After multivariable modelling adjusting for regular use.
Ref. = reference category; OR = odds ratio; CI = confidence interval.

useful for disinfection [2,3]. Cleaning of diaphragms using ethyl alcohol swabs was more commonly reported after contamination with blood or bodily secretions (34.4% after normal clinical use and 64.3% after contamination). In the absence of overt contamination, the less frequent use of an effective cleaning method may be due to a lower perceived risk of transmission of infection through the diaphragm in this situation.

The finding that having received previous information on stethoscope cleaning had a strong association with ever cleaning of stethoscopes focuses attention on the role of educating medical professionals regarding cleaning of medical equipment. This finding is important for policy-makers aiming to initiate education programmes informing doctors about the risks posed by contaminated stethoscopes. It may also be noted here that due to the cross-sectional design of this study, reverse causation cannot be ruled out (i.e. perhaps the decision to clean the stethoscopes led doctors to access information regarding stethoscope disinfection and not vice versa). Longitudinal studies are warranted to determine the effect of education on stethoscope cleaning.

It has been previously noted that communally used stethoscopes can have a higher bacterial colony count than personal stethoscopes [5]. The present study noted that reporting the use of a personal stethoscope at the last utilization was strongly associated with reporting ever cleaning (OR = 3.38). Possible strategies to reduce the risk of cross-infection from communal stethoscopes could include reducing the use of communal stethoscopes by urging doctors to buy and use their own stethoscopes, and establishment of protocols for regular disinfection of communal stethoscopes by hospital staff.

A number of foci for future research have been identified by the present report. Cohort and interventional studies on the effect of educating health care professionals regarding disinfection of their stethoscopes, on bacterial colonization of diaphragms and nosocomial infection rates in the hospital are warranted. Differences in cleaning practices among doctors affiliated with various specialties of medical practice demand a review of the emphasis placed on disinfection of equipment in the prevailing practice guidelines of these specialties.

In summary, this study found that a minority of practising doctors and

medical students in Pakistan cleaned their stethoscope diaphragms. Even those who cleaned stethoscopes tended to use an ineffective method of cleaning, i.e. wiping with a dry cloth. Having previous information about stethoscope cleaning, utilizing personal stethoscope at the last use and affiliation with the internal medicine department were notably associated with reporting ever cleaning of stethoscopes. There is need for further exploration of the role of educating health care providers about disinfection of medical equipment, in order to encourage regular and effective cleaning of stethoscopes used in clinical practice. This has the potential to reduce bacterial colonization of stethoscope diaphragms, and ultimately, nosocomial infection in hospitals settings.

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WHO Initiative on transformative scale-up of health professional education

Scaling up educational programmes to produce multi-disciplinary service delivery teams – which include a carefully balanced mix of clinicians, community health workers and health managers – is urgent and essential. However, simply increasing the numbers of workers is not enough. The shortage of health workers is compounded by the fact that their skills, competencies, clinical experience, and expectations are often poorly suited to the health needs of the populations they serve.

The WHO Initiative on transformative scale-up of health professional education aims to support and advance the performance of country health systems so as to meet the needs of individuals and populations in an equitable and efficient manner. Driven by population health needs, transformative scale-up is a process of education system and health systems reform that addresses the quantity, quality and relevance of health care providers in order to increase access to health service and to improve population health outcomes.

Further information about the Initiative is available at: http://www.who.int/hrh/education/initiatives/en/index.html

Characteristics of physicians practising in Lebanon: a survey

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خصائص الأطباء الذين يمارسون في لبنان: دراسة مسحيَّة

إيلي عقل، خليل الأسمر، بياتريس خاطر – منسَّى، نانسي مارون، سليم أديب

الخلاصة: كانت آخر المسوحات التي أجريت حول خصائص الأطباء العاملين في لبنان، والذي أجري سنة 1998، مصدراً للقلق حول الإفراط في أعداد الأطباء ووجود الثغرات في بناء القدرات. وقد أجرى الباحثون هذا المسح عن طريق الهاتف عام 2007 لعينة طَبَقيَّة عشوائية من الأطباء، لوصف الخصائص الديموغرافية والتعليمية والممارسات لدى 546 طبيباً يمارسون عملهم في لبنان. واتضح أن معظم الأطباء قد تخرجوا من كليات طب في أوروبا الشرقية أو لبنان خلال الثمانينات أو التسعينات من القرن الماضي، مع تدريب بعد التخرج في تخصص لا يتعلق بالرعاية الأولية في أحد بلدان أوروبا الغربية أو الشرقية. وتبيَّن أن معظمهم يمارسون منفردين، لاختصاص طبي أو جراحي، في مستشفى خاص أو في المواقع الحَضَرية. وكان معدل النسبة المئوية للوقت الذي يقضونه في التعليم وفي البحوث 2.4٪ و1.2٪ على التوالي. وتدلُّ هذه النتائج على وجوب الإقلال من التركيز على التدريب في الرعاية التخصصية بالمقارنة مع الرعاية الأولية والممارسة العامة، وعلى أن السياسات المستقبلية ينبغي أن تهدف لاجتذاب الأطباء إلى المناطق الريفية.

ABSTRACT The last survey of the characteristics of the Lebanese physician workforce, in 1998, raised concerns about the oversupply of physicians and gaps in capacity building. This telephone survey in 2007 of a stratified random sample of physicians describes the demographic, educational and practice characteristics of 546 physicians practising in Lebanon. A majority of the physicians had graduated from an eastern European or a Lebanese medical school, in the 1980s or 1990s, and had postgraduate training in a non-primary care specialty, in a western or eastern European country. The greatest numbers were practising solo, in a medical or surgical specialty, in a private hospital and in an urban setting. The average proportion of work time spent in teaching and research were 2.4% and 1.2% respectively. The findings suggest that less emphasis should be placed on training in specialty care compared with primary care/general practice and future policies should aim to attract physicians to rural areas.

Enquête sur les caractéristiques des médecins exerçant au Liban

RÉSUMÉ La dernière enquête sur les caractéristiques du corps médical libanais en 1998 a soulevé des inquiétudes au sujet du surnombre de médecins et des lacunes en renforcement des capacités. La présente enquête téléphonique menée en 2007 auprès d'un échantillon aléatoire stratifié de 546 médecins exerçant au Liban a répertorié leurs caractéristiques démographiques, académiques et professionnelles. La majorité d'entre eux avaient fait leurs études de premier et de deuxième cycles dans une faculté d'Europe orientale ou du Liban dans les années 1980 ou 1990, puis avaient suivi une formation de troisième cycle dans une spécialité autre que la médecine des soins primaires, dans un pays d'Europe orientale ou occidentale. La plupart exerçaient seuls une spécialité médicale ou chirurgicale, dans un établissement privé et en milieu urbain. La proportion moyenne du temps de travail consacré à l'enseignement et à la recherche était de 2,4 % et 1,2 % respectivement. Les résultats suggèrent qu'une importance moindre devrait être accordée à la formation de spécialité, et une place supérieure aux soins de santé primaires et/ou à la médecine générale. Les futures politiques devraient aussi tenter d'attirer les médecins dans les zones rurales.

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Introduction

The membership of the Lebanese physician workforce has witnessed many changes over recent years. Indeed the number of medical schools in Lebanon almost doubled over the last decade, increasing the number of Lebanese medical graduates. At the same time, a recent study suggested that a significant number of physicians returned to Lebanon from various parts of the world in the early 1990s, i.e. after the end of the civil war [1]. The repatriation of these physicians appears to have driven recent medical graduates to emigrate [1]. In 2005, 96% of students in Lebanese medical schools intended to travel abroad for postgraduate training [2].

The changes experienced by the Lebanese physician workforce can alter its composition and subsequently its educational, practice and other characteristics. There is a need to closely monitor the characteristics of the Lebanese physician workforce in order to guide human resource planning as well as medical education and medical practice policies [3]. One example of such policies is a recent proposal to regionalize health care in the Middle East and transform Lebanon into an academic medical hub [4].

The last survey of the characteristics of the Lebanese physician workforce was conducted in 1998 and raised concerns about the oversupply of physicians and gaps in capacity building [5]. Thus the objective of the present study was to describe the demographic, educational, and practice characteristics of physicians practicing in Lebanon.

Methods

The study consisted of a confidential, interviewer-administered phone survey of a stratified random sample of all registered physicians practising medicine in Lebanon.

Sample

Our sampling frame consisted of physicians registered with one of the two professional associations of physicians in Lebanon: the Lebanese Order of Physicians (Beirut) and the Order of Physicians in North Lebanon (Tripoli). To be able to practise in Lebanon, physicians have by law to be registered with one and only one of these two Orders. Consequently, the databases of these associations should include all practising physicians in the country. We did not specify any exclusion criteria.

The target population included a total of 10 918 members. Each Order provided us in early 2007 and at no charge with all records of its database in Microsoft *Excel* format, after we had submitted a brief research proposal. The institutional review board of the American University of Beirut approved the study. We obtained the contact information of physicians from the databases of the associations, we stratified participants by their association and then randomly sampled subjects within each stratum in a proportional fashion. We aimed to collect responses 5% of the population (n = 546) similarly to the study by Kassak et al. [5]. This number would provide us with widths of confidence intervals between 6% and 8% (depending on the point value for the variable expressed as percentage), which we deemed appropriate. Assuming a response rate of 70%, we planned to contact 780 physicians.

Data collection

We conducted the survey during the summer seasons of 2007 and 2008. The databases include the following for each registered physician: personal information (full name, date of birth, place of birth), educational characteristics (year of medical school graduation, country of medical school, type of specialty training, year of completion of specialty training, country of specialty training), year of registration (only for Lebanese Order of Physicians) and contact information.

One of the investigators (K.E.A.) with expertise in survey research coordinated the process of data collection. He recruited a sociology student for the role of research assistant then trained her on proper survey interviewing techniques. This included directly supervising the initial interviews and addressing any data collection challenges. During the process of data collection, and as part of data verification, we re-contacted and re-interviewed a randomly selected sample of physicians (20% of our sample). We also double-checked all data entry.

The research assistant made up to two attempts to contact the sampled physicians. When the physician was not available at the time of the call, the research assistant gave her/him the option of calling back at her/his convenience. We classified the reasons for non-response as: explicit refusal to participate, did not call back, had emigrated or invalid contact information. Participants received no monetary or other type of compensation. We informed participants about the possibility of being re-contacted as part of quality assurance.

Both associations collect the information at the time of registration and have no formal mechanism in place to update the contact information (the rest of the information being constant by nature). There was no formal attempt to validate the information in the databases. There were mechanisms, however, in place to avoid dual registration and to remove dead or retired physicians from the databases (personal communication with the executives of the associations). To confirm there were no dual registrations, we checked for duplicate records within and between the 2 databases using the "remove duplicate" function in Microsoft *Excel*; we found none.

Questionnaire

We developed the survey questionnaire based on a previous survey of physicians in Lebanon [5] and a review of the type of data collected for the American Medical Association's *Physician Masterfile* [6]. Two health service researchers reviewed the questionnaire for face and content validity. We pilot tested the questionnaire with 11 physicians to insure clarity comprehensiveness and feasibility. We excluded these physicians from the study sample.

The questionnaire was in Arabic and consisted of 4 sections:

- Demographic characteristics: age, sex, marital status and citizenship.
- Educational characteristics: country of medical school, name of medical school (if region was Lebanon), year of graduation from medical school, country of postgraduate training, postgraduate training, duration of postgraduate training and additional training.
- Practice characteristics: number of years in practice, types of activity, field of practice, primary type of practice and primary location of practice (self-reported). Type of practice referred to the nature of the service that the physician was delivering (inpatient, outpatient, teaching, research, administration). The type of practice related to the organizational structure within which the service (mainly clinical) was being delivered.

Interviews lasted 7 minutes on average.

Statistical analysis

We first conducted descriptive analyses using percentages for categorical variables and means and standard deviations (SD) for continuous variables. Then we crossed-tabulated type of practice with primary site of practice and used the chi-squared test for statistical significance. We categorized internal medicine, family medicine, paediatrics and obstetrics/gynaecology as primary care specialties [7]. We categorized countries of medical school and of training by world region based on the United Nations classification [8].

We used Microsoft Office *Excel* 2003 for data entry and management. We used *Stata*, version 10, and *SPSS*, version 13.0 for data analyses. We considered a 2-sided *P*-value < 0.05 as indicative of statistically significant associations.

Results

We sampled and attempted to contact a total of 778 physicians. Of these, 546 participated in the survey (70% response rate, 88% after excluding physicians who emigrated or for whom the contact information was not valid). Causes for non-participation were as follows: explicit refusal to participate (70), did not call back (23), emigrated (63), and invalid contact information (75).

Demographic characteristics

The mean age of participants was 47.4 (standard deviation 10.1) years. They were predominantly male (85.9%) and married (87.0%). All but 6 (98.9%) had Lebanese citizenship.

Educational characteristics

Table 1 shows the educational characteristics of the responding physicians. The top 2 regions of medical school graduation were eastern Europe (35.5%) and Lebanon (30.4%). The most common decades of graduation were the 1990s and 1980s (each about 35% of physicians). While 12.3% had not pursued postgraduate training (i.e. were in general practice), 27.8% reported training in a primary care specialty. The top 2 regions of postgraduate training were western Europe (31.1%) and eastern Europe (25.5%). The mean duration of postgraduate training was 4.4 (SD 1.3) years

Practice characteristics

Table 2 displays the practice characteristics of the responding physicians. The mean number of years in practice was 16.8 (SD 10.5). Most physicians were involved in inpatient care (85.0%) and outpatient care (84.4%); only 14.8% reported teaching activities and 7.9% were involved in research. The average proportion of work time spent in teaching and research were 2.4% (SD 6.8%) and 1.2% (SD 6.9%) respectively. The distribution of the field of practice reflected to a large degree the distribution of the postgraduate training. While 73.8% reported practising solo, only 2.6% reported being a partner in a medical group and only 2.9% reported affiliation with a private university.

The primary location of practice was urban for 71.8% of respondents (Table 2). Table 3 shows that a general practice or a primary care specialty practice was reported by 68.0% of physicians whose primary site was a village versus 39.9% of physicians whose primary site was urban. The results were statistically significant ($P = 0.017$).

Discussion

The educational characteristics applying to a majority of the physicians practising in Lebanon were: graduation from an eastern European or a Lebanese medical school, in the 1980s or the 1990s and postgraduate training in a non-primary care specialty and in a western European or an eastern European country. The practice characteristics showed that a majority of these physicians were practising solo in a medical subspecialty or a surgical specialty, in a private hospital and in an urban setting.

This is the first survey of Lebanese physicians since 1998 [5] and is also the first study to explore certain practice characteristics (e.g. primary employer). In terms of limitations, the sampling frame apparently included a number of physicians who had emigrated but were

Table 1 Educational characteristics of respondents to a survey of physicians practising in Lebanon in 2007–2008 (*n* = 546)

Variable	No.[a]	%
Region of medical school[b]		
Eastern Europe	194	35.5
Lebanon	166	30.4
Western Europe	87	15.9
Northern Africa	37	6.8
Other	53	9.7
Lebanese medical school (n =166)		
Université Saint Joseph	78	14.3
American University of Beirut	50	9.2
Lebanese University	36	6.6
Beirut Arab University	2	0.4
University of Balamand	0	0.0
Graduation year		
Before 1970	27	4.9
1970–79	73	13.4
1980–89	185	33.9
1990–99	195	35.7
After 1999	63	11.5
Region of postgraduate training		
Western Europe	170	31.1
Eastern Europe	139	25.5
Lebanon	99	18.1
North America	26	4.8
Other	29	5.3
Postgraduate training		
Medical subspecialty	133	24.4
Surgical specialty	132	24.2
Primary care specialty[c]	152	27.8
General practice (no training)[c]	67	12.3
Other	57	10.4
Training in research	183	33.5
Training in teaching	117	21.4
Training in administration	56	10.3
Higher degree		
Masters degree	53	9.7
Doctoral degree	39	7.1

[a] *Missing observations in some categories.*
[b] *Regions of the world are based on the United Nations classification [8].*
[c] *Primary care refers to residency training in internal medicine, family medicine, paediatrics or obstetrics and gynaecology. General practice refers to physicians who completed no residency training.*

still registered (8% of our sample). However, this should not affect the representativeness of our sample since our target was essentially those physicians actually practising in Lebanon. Also, the characteristics of the survey respondents varied from those of the target population (they tended to be younger and more likely to have graduated from Lebanon). This leaves some uncertainty about the generalizability of the results to the overall population. In the absence of a standardized and validated classification of the degree of urbanization of Lebanese regions of Lebanon, we used the respondents' self-reported classification, which limits the validity of the location of practice results.

Compared with the 1998 survey [5], and for variables defined similarly in the 2 studies, the mean age and percentage of males were similar. However, we found a higher proportion of graduation from eastern European countries (35.5% versus 30.4%), and a lower proportion in solo practice (73.8% versus 91%). While in the 1998 survey the percentage of physicians in general practice or primary care was 44%, in our survey this percentage was 38.0%. In the 1998 survey the average number of years of experience was 13 while in our survey the average number of years in practice was nearly 17. These differences likely reflect the time trends of these variables over the last 10 years.

The results of this study highlight the challenges facing physicians as well as the medical education system (e.g. the low percentage of physicians trained in primary care specialties) and medical practice in Lebanon (e.g. the predominance of solo practice and specialty practice in the city). They also show that the great majority of physicians were engaged at the same time in inpatient care (85.0%) and outpatient care (84.4%), signifying that the hospitalist model has not been adopted widely in Lebanon [9]. It is interesting that 14.8% of physicians reported teaching activities, while only 2.9% reported affiliation with a private university. A potential explanation for this finding is that a substantive number of physicians working in non-university hospitals supervise rotating trainees.

The profile of the medical workforce may impact on the services it delivers. For example, in terms of access, it suggests a potential access problem in rural areas. The high percentage of specialization may negatively affect the quality of care delivered. It may also be driving some of the costs of health care; for example, a recent study found a relatively high rate of coronary angiography in Lebanon mostly conducted without appropriate indications [10].

Table 2 Practice characteristics of respondents to a survey of physicians practising in Lebanon in 2007–2008 (*n* = 546)

Variable	No. [a]	%	Mean (SD) % worktime
Type of activity [b]			
Inpatient care	464	85.0	44.0 (28.7)
Outpatient care	461	84.4	48.9 (44.0)
Teaching	81	14.8	1.3 (6.9)
Research	43	7.9	2.4 (6.8)
Administration	20	3.7	1.2 (8.1)
Field of practice [c]			
Medical subspecialty	135	24.7	–
Surgical specialty	130	23.8	–
Primary care specialty	146	26.7	–
General practice	77	14.1	–
Other	55	10.1	
Primary type of practice [b]			
Solo practice	403	73.8	–
Partner in medical group	14	2.6	–
Public hospital	131	24.0	–
Private hospital	330	60.4	–
Private university	16	2.9	–
Other	33	6.1	–
Primary location of practice			
City	392	71.8	–
Suburbs	62	11.4	–
Town	63	11.5	–
Village	28	5.1	–

[a]Missing observations in some categories. Cross-tabulation revealed that 2 of 132 who reported surgical training reported practising as a general practitioner.
[b]Respondents could choose more than 1 option.
[c]Primary care refers to residency training in internal medicine, family medicine, paediatrics or obstetrics and gynaecology. General practice refers to physicians who completed no residency training.
SD = standard deviation.

Future research should continue to monitor the trends of the demographic, educational, practice and economic characteristics of the physician workforce. To that effect, the Orders of Physicians should consider conducting regular surveys of their memberships using a standardized and validated questionnaire. One efficient way would be a mandatory survey at the time of the yearly registration renewal.

The results of our survey should be helpful for setting both medical education policies and medical practice policies. On the medical education level, less emphasis should be placed on training in specialty care compared with primary care or general practice. On the medical practice level, future policies and planning should aim to attract physicians to rural areas. There is also a need to reorient health care delivery from specialty care to primary care and encourage group practices as an efficient way to deliver care. The development of publicly accessible and regularly updated data sets through yearly registration would help in monitoring the impact of such policies and plans [11,12].

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Table 3 Location of practice by field of practice of physicians practising in Lebanon in 2007–08

Location of practice	Total[a]	General practice[b]		Primary care specialty[c]		Medical subspecialty		Surgical specialty		Other	
		No.	%	No.	%	No.	%	No.	%	No.	%
City	381	49	12.9	103	27.0	99	26.0	91	23.9	39	10.2
Suburbs	62	12	19.4	11	17.7	9	14.5	21	33.9	9	14.5
Town	63	4	6.3	21	33.3	19	30.2	13	20.6	6	9.5
Village	25	8	32.0	9	36.0	3	12.0	4	16.0	1	4.0

$\chi^2 = 24.61$; $P = 0.017$.
[a]Missing observations in some categories; [b]General practice refers to physicians who had completed no residency training; [c]Primary care refers to residency training in internal medicine, family medicine, paediatrics or obstetrics and gynaecology. .
SD = standard deviation.

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Transformative scale up of health professional education

At the request of its Member States and partners, WHO is developing policy guidelines to assist countries, development partners and other stakeholders in efforts to expand the health workforce and improve the alignment between the education of health workers and population health needs. The first set of guidelines in this process will recommend the transformative scale up of health professional education and aims to increase the quantity, quality and relevance of health professionals to strengthen their impact on population health.

Transformative scale up of health professional education: an effort to increase the numbers of health professionals and to strengthen their impact on population health provides a background and overview of WHO's effort to provide guidance on the transformative scale up of health professional education.

This document is available at: http://www.who.int/hrh/resources/transformative_education/en/index.html

Overweight/obesity and hypertension in schoolchildren aged 6–16 years, Aden governorate, Yemen, 2009

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زيادة الوزن/ السمنة وارتفاع ضغط الدم لدى تلاميذ المدارس الذين تتراوح أعمارهم بين 6-16 سنة، محافظة عدن، 2009

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الخلاصة: تمثِّل البدانة وفرط ضغط الدم لدى الأطفال مزيداً من القلق في جميع أرجاء العالم. وقد أجرى الباحثون دراسة مستعرضة حول فرط ضغط الدم وعلاقته بالبدانة وفرط الوزن بين أطفال المدارس الابتدائية الذين تتراوح أعمارهم بين 6 و16 عاماً في عدن في اليمن؛ وذلك عام 2009؛ مستخدمين الاعتيان العشوائي الطَبَقي المتعدد المراحل، وشملت العينة 1885 طفلاً تم تصنيفهم وفقاً لمنسب كتلة الجسم إلى هزيلين، وذوي وزن سوي، وذوي وزن مفرط، وبدينين. واتضح أن معدل انتشار الهزال 10.1٪، والوزن السوي 69.2٪، وفرط الوزن 12.7٪، والبدانة 8.0٪. أما معدل ارتفاع ضغط الدم (وفقاً لمعايير منظمة الصحة العالمية)، فكان 8.2٪ لطليعة فرط ضغط الدم، و2.4٪ لفرط ضغط الدم، وكانا يترابطان ترابُطاً يُعْتَد به إحصائياً بوجود فرط الوزن أو البدانة. ووجد الباحثون أن منسب كتلة الجسم مضافاً إلى عمر الطفل هو بمثابة منبئ على ضغط الدم الانقباضي والانبساطي. وتقدم الدراسة مزيداً من البيِّنات على أن البدانة وفرط الوزن يترابطان مع فرط ضغط الدم لدى أطفال المدارس.

ABSTRACT Hypertension and obesity in children are increasing concerns worldwide. A cross-sectional study of hypertension in relation to overweight/obesity was conducted in 2009 among schoolchildren aged 6–16 years in Aden, Yemen. Using multistage stratified random sampling 1885 children were classified into wasted, normal weight, overweight and obese according to body mass index. The prevalence of wasting was 10.1%, normal weight 69.2%, overweight 12.7% and obesity 8.0%. The rate of high blood pressure (World Health Organization criteria) was 8.2% for prehypertension and 2.4% for hypertension and was significantly related to the presence of overweight or obesity. Child's body mass index combined with age was a predictor for systolic and diastolic blood pressure. The study provides further evidence that overweight/obesity is associated with hypertension in these schoolchildren.

Surcharge pondérale, obésité et hypertension chez des élèves âgés de 6 à 16 ans et scolarisés dans le gouvernorat d'Aden (Yémen) en 2009

RÉSUMÉ L'hypertension et l'obésité chez les enfants sont des préoccupations croissantes dans le monde. Une étude transversale sur l'hypertension en relation avec la surcharge pondérale et/ou l'obésité a été menée en 2009 auprès d'élèves âgés de 6 à 16 ans à Aden (Yémen). Un échantillon aléatoire stratifié à plusieurs degrés de 1885 enfants a été réparti en fonction de leur indice de masse corporelle dans les catégories suivantes : émaciation, poids normal, surcharge pondérale ou obésité. La prévalence de l'émaciation était de 10,1 %, d'un poids normal de 69,2 %, d'une surcharge pondérale de 12,7 % et d'une obésité de 8,0 %. Les taux de l'hypertension selon les critères de l'Organisation mondiale de la Santé, étaient de 8,2 % pour la préhypertension et de 2,4 % pour l'hypertension. Ceux-ci étaient fortement liés à une surcharge pondérale ou une obésité. L'indice de masse corporelle des enfants associé à l'âge était un facteur prédictif de tension artérielle systolique ou diastolique. L'étude fournit aussi d'autres preuves qu'une surcharge pondérale et/ou une obésité sont associées à une hypertension chez les élèves.

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Introduction

Overweight and obesity are linked to serious health consequences, notably cardiovascular diseases, which are the world's number one cause of death in developed as well as in developing countries [1]. Studies have shown that obese people have a 5 times greater incidence of hypertension than those of normal weight [2,3]. The obesity epidemic has also been linked to an increase in the number of children with high blood pressure. Scientists in the United States (US) found that while more than 3% of children studied had high blood pressure, three-quarters of them had not been properly diagnosed [4]. Around 30% of overweight children have abnormal blood pressure. Therefore, weight loss is the initial treatment choice for high blood pressure in children [5].

In a developed country such as the US, more than 4 million children are estimated to have hypertension, a number that has increased 5-fold over the last 30 years, and has been linked to growing obesity in children among other factors [6]. The same pattern has been found in developing countries; for example in India the prevalence of hypertension in overweight schoolchildren was significantly higher than that among normal weight children [7]. An emerging double burden of both malnutrition and obesity has also been identified in developing countries. This poses the possibility that such an association could also be present in Aden, a city in southern Yemen, where there is a lack of data about these issues. The aim of the present study was to investigate the relationship between overweight/obesity and high blood pressure levels in primary-school children from Aden governorate. The results of the study will help to design programmes for the prevention and control of the disease in childhood, which could decrease the impact of chronic disease in adulthood.

Methods

This was an observational, cross-sectional study, conducted in Aden governorate, Yemen. The data collection period was from February to December 2009. Approval for the study was obtained from the Faculty of Medicine and local authorities. Informed consent was obtained from the parents for their children to be enrolled in the study.

Sample

The study subjects were chosen from the target population that included all of primary-school children of Aden governorate aged between 6 and 16 years (108 982 children) [unpublished data, Ministry of Education, Aden, Yemen]. In Yemen, primary school (basic) education start at age 6 years and continues for 9 years. From the total of 130 schools, 8 schools were selected using multistage stratified random sampling, with attention to proportional allocation by type of school (public or private), in each geographical area of the city, to obtain a representative sample of the target population. The schools were numbered and chosen using random tables. One class from each level was randomly chosen in the selected schools. The children were selected from each school record by systemic random sampling technique. After taking into account a possible 20% non-response rate and with 95% confidence, the sample size was calculated to be 1953 students, who were selected from 6 public and 2 private schools from 4 district of Aden governorate (Al-Mansora, Shaikh-Othman, Dar Sad and KhorMakser) [8]. From 1953 students given consent forms, 1885 consented and participated in the study (96.5% of response rate).

Data collection

The measurements of body weight and height were carried out by the researcher assisted by medical assistants in the school. Body weight was measured to the nearest 0.1 kg using an electronic scale (Seca, Japan). Body height was measured to the nearest 0.5 cm using a stadiometer (Seca, Germany) as the child stood erect against a vertical wall, in the Frankfort plane according to the published data [9]. Body mass index (BMI) was calculated as the ratio of the body weight to the square of body height (kg/m^2), and was classified into 4 categories to assess nutritional status as: wasted (< 3rd percentile), normal weight (≥ 3rd–< 85th percentile), overweight (≥ 85th–< 97th percentile) and obese (≥ 97th percentile). This classification was in accordance with the recommendations of the World Health Organization (WHO) Expert Committee in Overweight, and the 2007 WHO growth reference standards [10]. Twenty students (not included in the studied sample) were measured to calculate the intra-observer technical error of measurement. The range of values (0.1–0.3 for weight and 0.001–0.013 for height) were within the acceptable range [11].

Blood pressure was recorded twice by the researcher, and the value of the average systolic/diastolic blood pressure was classified according to the tables with cutoff points for each age, sex and height percentile as: normal (average systolic and diastolic blood pressure < 90th percentile), prehypertension (≥ 90th–< 95th percentiles) and hypertension (≥ 95th percentile) [12]. The blood pressure manometers used a cloth cuff with an inflatable rubber chamber. The widest chamber was used to increase the validity of the measurement. The chamber was wrapped around 80% to 100% of the right arm circumference, measured at the average point between the acromion and the olecranon, leaving the elbow bend and the axillary region free. Its height corresponds to 40% of this circumference. The sitting blood pressure measurement was taken twice by electronic scale, and the average values were recorded [13].

Data analysis

Data were processed and analysed using *SPSS* software, version 15. The chi-squared test, with a significance level of 5% ($P < 0.05$) was used to determine the possible relationship between overweight/obesity and blood pressure levels between the children.

Results

The 1885 schoolchildren participants were aged between 6 to 16 years (mean age 10.9 years). The results for nutritional status showed that overall 190 children (10.1%) were wasted, 1305 (69.2%) normal weight, 239 (12.7%) overweight and 151 (8.0%) obese,

From the total study group, 8.2% of the children had blood pressure levels defined as prehypertension and 2.4% as hypertension. Although the rate of prehypertension was slightly higher for females (9.4% versus 7.1% in males), for hypertension the results were similar (2.3% for males and 2.4% for females). There was no statistically significant relationship between sex and blood pressure in these children (Table 1).

There was a statistically significant relationship, however, between age group and the rate of prehypertension and hypertension ($P < 0.05$). In general, the proportion of children with normal blood pressure level in each age group was greater than those with prehypertension and hypertension. The rate of hypertension in children aged 6–9 years and 10–12 years (3.1% and 3.4% respectively) was significantly higher than those aged > 12 years (0.8%). In addition, the rate of prehypertension was lower in those aged 10–12 years (7.6%) compared with those aged 6–9 years and > 12 years (8.4% and 8.6% respectively) (Table 1).

There was a statistically significant relationship between the blood pressure levels and the presence of overweight/obesity in children ($P < 0.05$). Children who were overweight/obese showed a higher rate of prehypertension (21.8%) than those who were wasted/normal weight (4.7%). This was also true for hypertension (10.0% among overweight/obese children versus 0.4% for wasted/normal children) (Figure 1).

When linear regression analysis was applied it showed a linear relationship between child's BMI and age as predictor variables for both systolic and diastolic blood pressure (Table 2). The values of the multiple correlation coefficients (R) that indicate the strength of the association were 0.54 for systolic blood pressure and 0.41 for diastolic blood pressure; and the relationship was statistically significant ($P < 0.05$). The child's BMI made a higher contribution than child's age for both measures of blood pressure as the correspondent standardized coefficients show (0.37 for systolic blood pressure and 0.30 for diastolic blood pressure versus 0.24 and 0.15 respectively for child's age). According to the values of the coefficients R^2, child's age and child's BMI explained around one-third of the variation in the model for systolic blood pressure ($R^2 = 0.29$) and around one-sixth of the variation in the model for diastolic blood pressure ($R^2 = 0.16$) (Table 2).

Discussion

The results of the present study demonstrated that the overall prevalence of wasting among primary-school children from Aden governorate was high (10.1%). On the other hand, the prevalence of overweight and obesity were also high (12.7% and 8.0%, respectively), as an expression of the double burden of disease that has been described for malnutrition in underdeveloped countries [14].

In general the study showed that the rate of abnormal blood pressure was higher, although not significant, in girls than in boys; this could be explained by the hormonal modifications related to puberty, which starts earlier among girls than among boys [15]. This agrees with some researches in Kuwait, India [16,17]. There was a significant relationship between age group and frequency of high blood pressure, with higher rates of hypertension in those aged 6–9 years and 10–12 years in this study. This is in

Table 1 Blood pressure levels among the studied primary-school children in Aden, Yemen, by sex and age group

Variable	Total	Blood pressure level						χ^2	*P*-value
		Normal		Prehypertension		Hypertension			
	No.	No.	%	No.	%	No.	%		
Sex								3.25	0.197
Male	981	888	90.5	70	7.1	23	2.3		
Female	904	797	88.2	85	9.4	22	2.4		
Age group (years)								11.54	0.021
6–9	643	569	88.5	54	8.4	20	3.1		
10–12	593	528	89.0	45	7.6	20	3.4		
> 12	649	588	90.6	56	8.6	5	0.8		
Total	1885	1685	89.4	155	8.2	45	2.4		

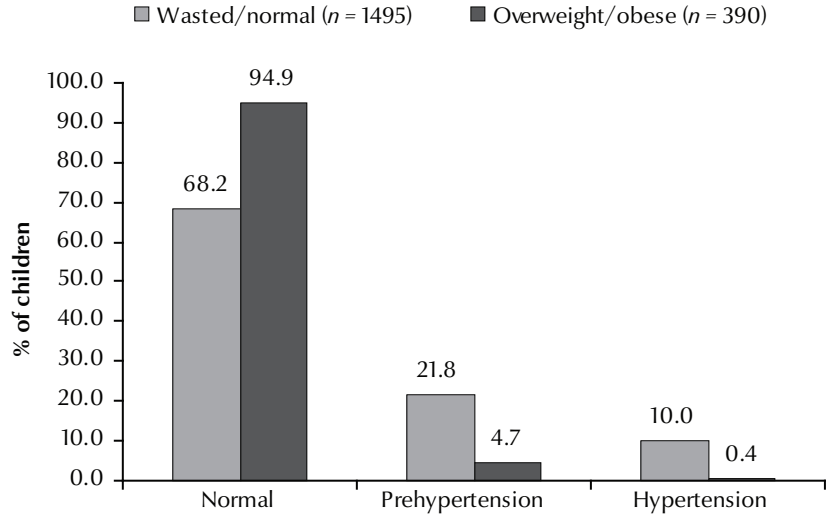

Figure 1 Relationship between nutritional status and blood pressure in primary-school children in Aden governorate, Yemen

agreement with one study in Germany [18].

Our study showed a statistically significant relationship between the presence of overweight/obesity and increased blood pressure in students. Increased blood pressure (prehypertension or hypertension) was present in 31.8% of overweight/obese children and this corresponds to other articles, which reported that 30%–35% of overweight/obese children had abnormal blood pressure [5,17,19]. Some researchers reported a relationship between hypertension in schoolchildren and consanguineous parents, family history of hypertension and obesity [16,20]. Hypertension was linked to sedentary lifestyles, altered eating habits, high fat content of the diet and low physical activity, but also possibly to genetic factors.

BMI is associated with blood pressure, as confirmed in the present study by the presence of a linear relationship, with child BMI and age combined as predictor variables of systolic and diastolic blood pressures. Both factors explained around one-third and one-sixth of the association in the models for systolic blood pressure and diastolic blood pressure respectively. This suggests that other factors may have influenced trends in blood pressure over time. Such factors may include nutrition characteristics, such as the intake of fruits, vegetables or dairy products or salt. According to the literature, whereas the total calorie intake has increased greatly in most countries worldwide, mixed trends (favourable and unfavourable) have been observed for specific nutrients that relate to hypertension [21]. There are no published data about these factors in the study group of Yemeni primary-school children.

Secular changes in non-dietary factors may also have impacted on the trends in elevated blood pressure over time according to the literature. Studies have shown that low birth weight is associated with elevated blood pressure in adults and children [22]. Increased stature of mothers, favourable changes in socioeconomic factors and other factors such as improved maternal nutrition can be related to increased blood pressure [21]. Breastfeeding has been related to lower blood pressure in children, which can be a result of the low salt content and high long-chain polyunsaturated fatty acid content of breastmilk [23]. Finally, in many countries, the amount of reported physical activity (particularly walking time or leisure exercise) has generally decreased [21]. In addition to being a risk factor for obesity (itself related to elevated blood pressure), low physical activity has been associated independently with higher blood pressure in children [24]. Again, there are no published data about these issues in the study population. So, future research should focus on identify the factors which are causing the increased prevalence of overweight and associated high blood pressure in primary-school children from Aden.

Table 2 Association of age and body mass index (BMI) with systolic and diastolic blood pressure in primary-school children from Aden, Yemen

Variable	Systolic blood pressure			Diastolic blood pressure		
	B	*β*	*P*-value	*B*	*β*	*P*-value
Child's age	0.79	0.24	< 0.001	0.41	0.15	< 0.001
Child's BMI	0.81	0.37	< 0.001	0.54	0.30	< 0.001
R	–	0.54		–	0.40	–
R^2	–	0.29		–	0.16	–
Constant	–	81.2		–	49.7	–

B = coefficient of the linear regression (unstandardized); β = standardized coefficient; R = multiple correlation coefficient.
Equations: Systolic blood pressure = 0.81 (BMI) + 0.75 (age) + 81.2. Diastolic blood pressure = 0.54 (BMI) + 0.41 (age) + 49.7.

Conclusion

This study showed that the prevalence of overweight and obesity were high in this population. In addition, the rates of high blood pressure, expressed as prehypertension and hypertension, were associated overweight and obesity

of the children. The rate of abnormal blood pressure was higher in children aged 6–12 years while the child' sex had no effect in this population. The child's BMI combined with age could predict systolic and diastolic blood pressure in these children. The results confirmed that BMI was associated with blood pressure, implying that weight loss is a useful intervention in children with hypertension.

Blood pressure levels should be assessed regularly in children and adolescents, and studies should be conducted to determine the prevalence of high blood pressure in this group nationwide. Unless effective procedure and preventive strategies are instituted at the local and national level, these data may predict a possible rise in cardiovascular disease in adults in future decades.

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Epidemiological study on tobacco smoking among university students in Damascus, Syrian Arab Republic

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دراسة وبائية حول تدخين التبغ بين طلاب الجامعات في دمشق، سورية

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الخلاصة: قليلة هي المعطيات حول تعاطي التبغ في سورية. وتقدر هذه الدراسة المسحيَّة المستعرضة المستندة على الاستبيان، معدل انتشار التدخين بين طلبة الجامعات في دمشق، وتتعرف على العوامل ذات الصِّلَة بالتدخين. ومِنْ بين 583 مستجيباً، كان المعدل الإجمالي لانتشار تدخين السجائر 20.8٪، وكان العمر الوسطي للمدخنين (25 ± 2.2 عاماً)، وهو أعلى بمقدار يُعْتَدُّ به من العمر الوسطي لغير المدخنين (21 ± 1.8 عاماً). وكان معدل انتشار التدخين بين الذكور (26.1٪) أعلى بمقدار يُعْتَدُّ به إحصائياً مما هو بين الإناث (9.5٪). ولو أن الطالبات يستهلكن عدداً من السجائر كل يوم أكبر بمقدار يُعْتَدُّ به (وسطياً 21 ± 5) مما يستهلكه الطلاب (9 ± 2). وكان معدل انتشار التدخين بين الطلاب في الكليات التي لا علاقة لها بالصحة (27.8٪) وهو أعلى بمقدار يُعْتَدُّ به من المهن الصحية (14.5٪)، كما كان معدل انتشار التدخين بين الطلاب الذين يعيشون بعيداً عن أُسَرهم (27.8٪)، أعلى بمقدارٍ يُعْتَدُّ به من أولئك الذين يعيشون مع أسرهم (16.2٪)، وتثير الدراسة مسائل متعلِّقة بالتدخين في مجالات تتعلق بمواضع إقامة الطلاب وأنماط التدخين بين النساء.

ABSTRACT There is a lack of data on tobacco use in the Syrian Arab Republic. This cross-sectional questionnaire survey estimated the prevalence of smoking among university students in Damascus and identified factors related to smoking. Among the 583 respondents, the overall prevalence of cigarette smoking was 20.8%. The mean age of smokers [25 (SD 2.2) years] was significantly higher than non-smokers [21 (SD 1.8) years]. Smoking prevalence among males (26.1%) was significantly higher than among females (9.5%). However, female students consumed a significantly higher number of cigarettes per day than did males [mean 21 (SD 5) versus 9 (SD 2)]. The smoking prevalence among students in non-health faculties (27.8%) was significantly higher than that of health professional students (14.5%) and was higher among students living away from their families (27.8%) than those living with their families (16.2%). The study raised concerns about smoking in student residences and women's smoking patterns.

Étude épidémiologique sur la consommation de tabac chez les étudiants à Damas (République arabe syrienne)

RÉSUMÉ Les données sur la consommation de tabac sont rares en République arabe syrienne. La présente enquête transversale par questionnaire a estimé la prévalence du tabagisme chez les étudiants en université dans la ville de Damas et a identifié les facteurs qui y sont liés. Sur un total de 583 répondants, la prévalence globale du tabagisme était de 20,8 %. L'âge moyen des fumeurs [25 ans (E.T. 2,2)] était significativement plus élevé que l'âge des non-fumeurs [21 ans (E.T. 1,8)]. La prévalence du tabagisme chez les étudiants de sexe masculin (26,1 %) était nettement plus forte que celle des étudiantes (9,5 %). Toutefois, les étudiantes consommaient un nombre bien plus important de cigarettes par jour que les étudiants [moyenne 21 (E.T. 5) contre 9 (E.T. 2)]. La prévalence du tabagisme chez les étudiants inscrits dans des facultés non spécialisées en sciences de la santé (27,8 %) était bien supérieure à celle des étudiants en santé (14,5 %) et supérieure chez les étudiants vivant loin de leur famille (27,8 %) par rapport aux étudiants vivant en milieu familial (16,2 %). L'étude a soulevé des inquiétudes concernant le tabagisme dans les résidences universitaires et les modes de consommation du tabac par les étudiantes.

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Introduction

Despite the well-known health risks of tobacco smoking [1–3] there are increasing numbers of youths starting to smoke at an earlier age [4,5]. Several studies have shown that smoking initiation during adolescence increases the likelihood of continued smoking during young adulthood and also decreases the chance of quitting [5–8]. Moreover, the prevalence of smoking among females is increasing worldwide, especially in developing countries.

Theories suggest that young people begin smoking to express their transition into adulthood. Some may smoke to adhere to their social group in the process of developing their own social network [7]. Other reasons are feelings of insecurity and to resolve mental stress and other emotional problems [6–8]. Women are also more likely to believe that smoking can control their weight [2,9]. The Theory of Triadic Influence stipulates that factors from 3 different levels of contacts can influence smoking onset among youth: individual characteristics (e.g. age and sex), characteristics of the immediate social environment (e.g. friends and family members) and characteristics of the broader social environment (e.g. school community) [4]. Therefore, identifying subgroups of youth who may be at greater risk than others to develop a nicotine habit is an important step forward in preventing smoking initiation, and controlling tobacco use [9].

Recent large-scale public health interventions in industrialized countries have contributed to a substantial decline in cigarette smoking among adults and adolescents [10]. This has not been the case in developing countries, including countries in the Middle East, where the prevalence of smoking continues to increase [11].There is a lack of population-based data on tobacco use in Syrian Arab Republic. The aims of this study were to estimate the prevalence of smoking among students of the Syrian International University for Science and Technology and to identify factors that may be related to smoking behaviour.

Methods

Setting and sample

A cross-sectional study was conducted from 1–30 October 2007. The study population was students of the Syrian International University for Sciences and Technology located in the Sahnayah district of Damascus (n = 1200). This private university was newly established and consisted of 6 faculties: medicine, dentistry, pharmacy, petroleum engineering, business administration and computer engineering and informatics. A stratified cluster sampling of 3 stages was implemented for the sample collection. In the first stage, students from each faculty were stratified according to their level of study (first, second or third year). Individuals were selected proportional to the number of students in each level. In the second stage the individuals were stratified again and selected proportionally according to sex. In the final stage, the chosen students from all faculties were grouped into clusters of manageable size. A simple random sample of 774 was collected.

Data collection

The selected individuals were informed about the purpose of the study and assured about the anonymity of the questionnaire and that the information would be used only for research purposes. A pre-tested questionnaire was designed based on those used in similar surveys [9,12] and distributed to all selected participants. The questionnaire included information about cigarette smoking status (current and past), the average number of cigarettes smoked daily and sociodemographic characteristics (age, sex, living away from family).

A current smoker was defined as a person who had smoked at least 100 cigarettes during his/her lifetime and was currently smoking. A former smoker was a person who had smoked at least 100 cigarettes during his/her lifetime but reported to have quit smoking. Individuals reporting either smoking < 100 cigarettes during their lifetime or never having smoked were categorized as non-smokers [13].

In order to maximize the response rate, the questionnaire returns were checked daily by trained researchers and if data were missing the questionnaire was immediately returned to the respondent for completion.

Statistical analysis

The data were analysed using *SPSS*, version 16.0. Data were presented in simple measures of frequencies, the significance of difference between proportions and means was tested using chi-squared test and *t*-test respectively, with *P*-value < 0.05 as the level of significance.

Results

Of the 745 students selected to participate in the study, 162 students (131 males and 31 females) did not return the questionnaire, refused to participate or could not be located during the data collection period. The analysis was therefore based on 583 students (394 males and 189 females) (response rate 75.3%). The mean age of the participants was 21 [standard deviation (SD) 1.2] years (range 17–28 years).

A total of 121 students (20.8%) reported being current smokers (Table 1). The mean age of non-smokers [21 (SD 1.8 years] was significantly lower than that of smokers [25 (SD 2.2) years] (t = 2.1, P < 0. 025).

The smoking prevalence among male students (26.1%) was significantly higher than that among females (9.5%) (χ^2 = 20.4, P < 0.001) (Table 1). Thus, a male student was at 3 times higher risk of becoming a smoker (OR = 3.36, 95% CI: 1.96–5.73, P < 0.001). Two males

Table 1 Characteristics of students who smoked compared with non-smokers in the Syrian International University for Sciences and Technology, Damascus, Syrian Arab Republic

Characteristic	Total	Smokers		Non-smokers		Test	*P*-value
Age (years)							
Mean (SD)	21 (1.2)	25 (2.2)		21 (1.8)		$t = 2.1$	< 0.025
	No.	**No.**	**%**	**No.**	**%**		
Sex							
Male	394	103	26.1	291	73.9	$\chi^2 = 20.4$	< 0.001
Female	189	18	9.5	171	90.5		
Residency							
Away from family	226	63	27.8	163	72.2	$\chi^2 = 10.7$	< 0.005
With family	357	58	16.2	299	83.8		
Faculty							
Health	421	61	14.5	360	85.5	$\chi^2 = 34.8$	< 0.001
Non-health	162	60	37.0	102	63.0		
Total	583	121	20.8	462	79.2		

SD = standard deviation.

and none of the female students were ex-smokers. The age range of female smokers (17–23 years) was smaller than that of male smokers (17– 28 years), while non-smokers of both sexes were in the same age range (17–20 years). In respect to the quantity of tobacco consumed, female students consumed a significantly higher mean number of cigarettes per day than did male students [21 (SD 5) versus 9 (SD 2)] ($t = 17.7, P < 0.005$).

Students studying in non-health faculties (computer engineering, administrative, petroleum engineering) had a significantly higher rate of smoking (37.0%) than students in health faculties (medicine, dentistry and pharmacy) (14.5%) ($\chi^2 = 34.8, P < 0.001$) (Table 1). The prevalence of smoking was significantly higher among students living in private apartments away from their families (27.8%) than those who were living with their families (16.2%) (OR = 1.99, 95% CI: 1.32–2.98) (Table 1).

Discussion

Cigarette smoking and other forms of tobacco use among children and adolescents is a significant public health concern. The prevalence of smoking at this university (20.8%) was higher than that reported among Syrian students in 2008 (10.9%) [14]. A similar trend of relatively high and rising smoking prevalence has been observed among young people in ASEAN countries [9]. The prevalence of smoking in our study, however, was much lower than that in Kuwait among individuals aged 20 and 30 years (37.1% and 50% respectively) [15].

The mean age of smokers in our study (25 years) was significantly higher than non-smokers (21 years). We had no data on the age of initiation of smoking but current smokers in this study may have started smoking before entry to the university. It could also be attributed to the higher smoking prevalence among non-health professional students who were older than health professional students [personal observation]. However, the mean age of smokers in our study was higher than that reported for students in Malaysia (18.6 years) and Kuwait (18 years) [15,16].

Cigarette smoking prevalence among males was about 3 times higher than among females (26.1% versus 9.5%). In Saudi Arabia the prevalence of smoking was more than 20 times that of females (21.2% versus 0.9%) [17]. The prevalence of cigarette smoking among females in our study (9.5%), however, was lower than that reported among female university students in Saudi Arabia (11%) and the United States (12%) [18,19]. On the other hand, the prevalence of cigarette smoking among females in this study was higher than that reported among women in a previous Syrian study during 2004 (7.4%) [14]. There is other evidence from Arab countries of significantly higher rates of cigarette smoking among males than females, which as been attributed to the social stigma attached to cigarette smoking in women [17]. However, several factors seem to be driving an increase in female smoking, especially in developing countries. The most important factor may be the rise in spending power among girls and women, which is making cigarettes more affordable. Social and cultural norms that have traditionally prevented women in many countries from smoking are also weakening, rendering smoking among women more socially acceptable. Greater female autonomy and changes in women's roles have been associated with smoking uptake in countries such

as the United States, prompting predictions of a similar pattern in developing countries [2].

Interestingly, females in our study smoked a significantly higher mean number of cigarettes per day compared with male smokers (21 versus 9 per day). This rate was higher than reported in United States among university female students and was also higher than in a study among girls and women in South-East Asia [9]. Reasons for the higher cigarette use among women might be related to their body perceptions. Increased concerns about body weight and dieting have been associated with both depression and smoking among adolescents, particularly girls [20]. Women are more likely than men to believe that smoking helps to control their weight, and this may be more pronounced in those with eating disorders [21]. In addition, uptake of smoking may be influenced by media messages that promote smoking with images of freedom, emancipation, slimness and glamour [9].

The students' residential status was another indicator of smoking in our study. Significantly more smokers (31.6%) than non-smokers (16.2%) were living away from their parents. This supports the theory that the social environment surrounding youth plays a major role in smoking behaviour. Both parental and peer smoking have been shown to be important predictors of smoking [19,22]. Students living away from their parents may be subject to a higher degree of peer influence compared with those living with their parents. Peers' smoking was associated with current smoking among university students in Syrian Arab Republic [12]. In the study, people who lived away from their families were about twice as likely to be smokers as people residing within their families, which agrees with the findings of a Kuwait study [15]. A smoke-free environment is likely to deter students from smoking and can also protect students from second-hand smoke; exposure to smoke in public areas was reported to be the main form of environmental tobacco exposure among adolescents in Cambodia [23].

Because the study was conducted in only one locality, the findings could not be extrapolated to the general student population of Syrian Arab Republic. There may have been underreporting of smoking among students particularly female students, due to the stigma of women smoking in Arab culture.

In conclusion, smokers in our study were older than non-smokers suggesting that it is important to provide smoking control interventions and health education for youths at an earlier age before they begin smoking. As students living at home were more likely to be smokers than those living in university residences, academic institutions should be encouraged to provide smoke-free college residences. Finally, although this cross-sectional study did not provide evidence of rising rates of women smoking over time, the finding that those women students who smoked were smoking more heavily than men is a concern. Developing countries have reported increasing rates of smoking among women and the government needs to treat tobacco use among women as a priority health issue.

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Exposure to second-hand smoke in the Eastern Mediterranean Region

WHO released a report entitled *Exposure to second-hand smoke in selected public places in the WHO Eastern Mediterranean Region* during the 15th World Conference on Tobacco or Health, held in Singapore, from 20 to 24 March 2012. The report contains the results of a pilot study conducted in 11 countries of the Region that documented second-hand smoke levels in enclosed public places to assess compliance with smoke-free policies and legislation. Based on the findings from the participating countries, the report suggests steps that can help improve enforcement of 100% smoke-free policies.

This document is available at: http://applications.emro.who.int/dsaf/emropub_2012_1357.pdf

Prehypertension among young adult females in Dammam, Saudi Arabia

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مقدِّمات فرط ضغط الدم بين الشابات في الدمام، المملكة العربية السعودية

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الخلاصة: هدفت الدراسة إلى التعرف على معدل انتشار مقدِّمات فرط ضغط الدم وعوامل الاختطار المترابطة معه بين الشابات في الدمام، في المملكة العربية السعودية، وهي دراسة مستعرضة شملت عينة تتألف من ثلث الطالبات المنتسبات إلى أربع كليات في جامعة الدمام. وقد تمّ تحرّي الشابات من حيث ارتفاع ضغط الدم وعوامل الاختطار القلبية الوعائية المترابطة معه لديهنّ من خلال استبيان يستكمل أثناء المقابلة. وقد قامت الباحثات بقياس الوزن والطول ومحيط الخصر والورك وضغط الدم، واختبارات عشوائية لسكر الدم، وقد أظهرت النتائج أن 13.5٪ من بين 370 طالبة مصابات بمقدِّمات فرط ضغط الدم. وأن عامل الاختطار الأكثر شيوعاً للأمراض القلبية الوعائية هو نقص النشاط البدني (53.2٪)، يتلوه البدانة وفرط الوزن (29.1٪)، وأن 16.3 من الطالبات المصابات بمقدِّمات فرط ضغط الدم لديهن ثلاثة أو أكثر من عوامل الاختطار، كما أظهر تحليل التحوف اللوجستي أن البدانة وفرط الوزن كان المنبئ الأقوى بمقدِّمات فرط ضغط الدم. وتدل هذه الدراسة على الحاجة إلى قياسات روتينية لضغط الدم وتقييم الاختطار لدى الشابات في المملكة العربية السعودية.

ABSTRACT The aim of present study was to determine the prevalence of prehypertension and associated risk factors among young adult females in Dammam, Saudi Arabia. A cross-sectional study was conducted on a sample of about one-third of female students enrolled in 4 colleges of the University of Dammam. They were screened for high blood pressure and associated cardiovascular risk factors by an interview questionnaire. Weight and height, waist and hip and blood pressure measurements and random blood glucose testing were done. The results revealed that 13.5% of the 370 students were prehypertensive. The most prevalent risk factor for cardiovascular diseases was physical inactivity (53.2%), followed by overweight/obesity (29.1%); 16.3% of prehypertensive students had 3 or more risk factors. Logistic regression analysis revealed that overweight/obesity was the strongest predictor of prehypertension. Our study indicates a need for routine blood pressure measurements and risk assessment in young adult females in Saudi Arabia.

Préhypertension chez des jeunes femmes à Dammam (Arabie saoudite)

RÉSUMÉ L'objectif de la présente étude était de déterminer la prévalence de la préhypertension et les facteurs de risque associés chez des jeunes femmes à Dammam (Arabie saoudite). Une étude transversale a été menée sur un échantillon d'environ un tiers des étudiantes inscrites dans quatre facultés de l'Université de Dammam. Les étudiantes ont bénéficié d'un dépistage de l'hypertension artérielle. Les facteurs de risque cardio-vasculaire associés ont été recueillis par questionnaire lors d'un entretien. La taille et le poids, le tour de taille et des hanches ont été mesurés, ainsi que la tension artérielle. En outre, une analyse de la glycémie a été effectuée de manière aléatoire. Les résultats ont révélé que 13,5 % des 370 étudiantes souffraient de préhypertension. Les facteurs de risque les plus prévalents pour les maladies cardio-vasculaires étaient la sédentarité (53,2 %), suivie par la surcharge pondérale/l'obésité (29,1 %) ; 16,3 % des étudiantes préhypertendues présentaient trois facteurs de risque ou plus. L'analyse de régression logistique a mis en évidence le fait que la surcharge pondérale/l'obésité était le facteur prédictif le plus important de la préhypertension. Notre étude souligne la nécessité d'une surveillance systématique de la tension artérielle et d'une évaluation des risques chez les jeunes femmes en Arabie saoudite.

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Introduction

Chronic diseases such as cardiovascular diseases (CVD) are rising dramatically in the Eastern Mediterranean Region. About 45% of the region's disease burden is due to noncommunicable diseases and it is expected that this burden will rise to 60% by the year 2020. Primary prevention, with a focus on reducing avoidable risk factors, is the most cost-effective approach to containing this emerging epidemic [1]. One of these risk factors is hypertension, which is associated with an increased risk of morbidity and mortality from CVD and is one of the main preventable causes of death. Prospective observational studies have suggested that the risk of CVD death begins at systolic/diastolic blood pressure (BP) 115/75 mm Hg and doubles for each increment of 20/10 mm Hg in a nearly linear fashion. Also, arterial stiffness and other abnormal effects begin long before the 140/90 mm Hg threshold at which clinicians began treating hypertension [2]. Accordingly, the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC7) introduced a new category, "prehypertension", defined as systolic BP of 120–139 mm Hg and/or a diastolic BP of 80–89 mm Hg, replacing former categories of "above optimal" and "high normal". The rationale for redefining this category was to emphasize the excess risk associated with BP in this range and to focus increased clinical and public health attention on prevention [3].

In Saudi Arabia a national study was conducted in 1998 to determine the prevalence of hypertension among the adult population. It revealed that its prevalence was higher among males (18.7%) than females (14.0%) and was highest in the Eastern province [4]. A more recent national study in 2007 reported a higher prevalence rate of hypertension among Saudi adults (28.6% for males and 23.9% for females), indicating a rising trend in hypertension in Saudi Arabia [5]. Screening of young men for prehypertension in the Western region of Saudi Arabia in 2008 revealed that its prevalence was 17.3% [6], while among male university students in the Eastern region the prevalence was 32.7% [7]. Data on prehypertension in young adult females in the Eastern province, however, is lacking. Thus, the aim of the present study was to determine the prevalence of prehypertension and associated risk factors among young adult females in Dammam city, Eastern province, Saudi Arabia.

Methods

A cross-sectional study was conducted in the University of Dammam, after taking all the necessary academic and administrative approvals from the related authorities.

Sample

The target population consisted of 1300 female university students registered for the academic year 2005–06 in 4 colleges. The sample size was calculated using *Epi Info,* version 2.3.1. It was found that at expected frequency of prehypertension of 14% [4], at worst acceptable frequency of ± 3% and at a confidence level of 95%, the minimum required sample size was 368. Accordingly, 370 students were selected by multistage stratified random sampling with proportional allocation from the different colleges and academic levels. Within each level students were selected from the registration list by systematic random sampling, choosing every 3rd student until the proportionate sample was obtained. Pregnant students were excluded from the sample. The sample size represented about 28% of the target population.

Data collection

A modified Arabic version of the World Health Organization STEPwise approach to Surveillance (WHO-STEPS) instrument for collecting data on noncommunicable diseases risk factors was used, which was reviewed and approved by all members of the faculty of family and community medicine.

Interviews

Trained interviewers approached the selected students in their classrooms, informed them about the nature of the study, assured them about the confidentiality of collected data and requested their participation. Interviewers were specially trained to ask questions in a non-judgemental manner to avoid bias in responses.

The interview questionnaire collected data on sociodemographic details and risk factors for CVD (e.g. current daily tobacco smoking, moderate intensity physical activity for 30 minutes 3 times per week, hypercholesterolaemia, diabetes, hypertension and family history of hypertension), as well as dietary habits (e.g. frequency of consuming vegetables, fruits and fast food per week and type of fat used for cooking). The later was an open-ended question categorized into saturated or unsaturated fat by the researchers during data entry for statistical analysis.

Physical measurements

Physical measurements and blood samples were taken by a trained nurse during lunch time at the university clinic under the supervision of the research team and after taking informed consent from the participants. Weight and height were measured and body mass index (BMI) was calculated. It was classified into: normal weight (BMI 18.5–24.9 kg/m^2), overweight (BMI 25–29.9 kg/m^2) and obesity (BMI ≥ 30 kg/m^2). Waist to hip ratio was estimated and a value ≥ 0.8 was considered as central obesity. Two BP measurements were taken while the student was seated and the average was recorded. BP was classified according to the JNC7 criteria as follows: normal < 120 mm Hg systolic and < 80 mm Hg diastolic; prehypertension: 120–139

mm Hg systolic or 80–89 mm Hg diastolic; hypertension: ≥ 140 mm Hg systolic or ≥ 90 mm Hg diastolic [3]. Students on anti-hypertensive medications were considered as hypertensive. Diabetes was considered if random capillary blood glucose was > 200 mg/dL. Students on hypoglycaemic medications were considered as diabetic.

Data analysis

The collected data was analysed by *SPSS*, version 17. After verification of data, they were analysed and presented in descriptive tables. The chi-squared test was used for qualitative binomial analysis and Fisher exact test was used if the expected frequency was less than 5 in more than 20% of the cells. Logistic regression analysis of different sociodemographic characteristics and risk factors affecting prehypertension was conducted and a *P*-value of < 0.05 was considered statistically significant.

Results

While all the 370 selected students agreed to respond to the questionnaire, 9 students declined to have their physical measurements and blood samples taken, giving a response rate of 97.6% for some of the data.

The mean age of the students was 19.9 (SD 1.4) years. The great majority were single (91.9%) and the rest were married. More than half of the students' fathers were university graduates (53.5%) and only 4.9% were illiterate, in comparison with 33.2% and 8.1% of the mothers respectively. Of the students 69.7% came from high-income families and only 4.9% from low-income families.

It was found that 13.5% of these female university students had prehypertension (3.8% had high normal BP 130–139 mm Hg systolic BP or 85–89 mm Hg diastolic BP) and 2.7% had hypertension. Only 40% of hypertensive students were aware of being hypertensive.

No significant associations between sociodemographic characteristics and high BP was detected. However, hypertension was more common among students from low-income families compared with high-income families (11.8% versus 1.6%) ($P = 0.059$) (Table 1).

The most prevalent risk factor for high BP among these female university students was physical inactivity (53.2%), followed by overweight and obesity (20.6% and 8.5% respectively; 29.1% overall), family history of hypertension (17.6%) and central obesity (6.6%) (Table 2).

Table 2 also shows a strong association between high BP and overweight/obesity, diabetes and

Table 1 Sociodemographic characteristics of female university students by blood pressure group

Sociodemographic characteristic	Total	Blood pressure group			*P*-value
		Normal	Prehypertension	Hypertension	
	No.	%	%	%	
Age (years)					
< 20	165	81.0	15.8	3.2	0.487
≥ 20	205	85.7	11.8	2.5	
Marital status					
Single	340	83.5	14.1	2.4	0.183
Married	30	85.7	7.1	7.1	
Father's education					
Illiterate/read & write	18	83.3	11.1	5.6	0.936
Primary/preparatory	51	82.4	15.7	2.0	
Secondary/diploma	103	85.0	12.0	3.0	
University/postgraduate	198	83.2	14.1	2.6	
Mother's education					
Illiterate/read & write	30	86.7	13.3	0.0	0.791
Primary/preparatory	110	81.1	14.2	4.7	
Secondary/diploma	107	86.3	12.7	1.0	
University/postgraduate	123	82.9	13.8	3.3	
Income					
Low	18	82.4	5.9	11.8	0.059
Middle	94	86.2	9.6	4.3	
High	258	82.8	15.6	1.6	
Total	370	83.6	13.5	2.7	

Table 2 Risk factors for cardiovascular disease among female university students by blood pressure group

Risk factor	Total	Blood pressure group			*P*-value
		Normal	Prehypertension	Hypertension	
	No.	%	%	%	
Physical inactivity					0.54
Yes	197	83.3	13.0	3.6	
No	173	84.0	14.2	1.8	
Overweight/obesity[a]					0.001
Yes	105	71.7	24.5	3.8	
No	256	88.6	9.0	2.4	
Family history of hypertension					0.42
Yes	65	82.0	14.8	3.3	
No	305	87.2	11.1	1.7	
Central obesity[a]					0.50
Yes	24	78.3	17.4	4.3	
No	337	83.6	13.7	2.7	
Hypercholesterolaemia					0.001
Yes	12	58.3	8.3	33.3	
No	358	84.1	14.0	1.8	
Smoking					1.00
Yes	5	100.0	0.0	0.0	
No	365	83.4	13.8	2.8	
Diabetes[a]					0.001
Yes	4	25.0	0.0	75.0	
No	357	84.3	13.7	2.0	

[a] *9 students declined to participate.*

hypercholesterolaemia. One-quarter of overweight/obese female university students (24.5%) had prehypertension and 3.8% had hypertension, compared with only 9.0% and 2.4% of normal weight students respectively. Three quarters (75.0%) of diabetic students had hypertension, compared with only 2.0% of non-diabetic students. Also, about one-third of hypercholesterolaemic students (33.3%) had hypertension, compared with only 1.8% of students with cholesterol in the normal range. These differences were highly statistically significant ($P < 0.001$). No significant associations between high BP and physical inactivity, family history of hypertension and central obesity were recognized. All the students who smoked ($n = 5$) were normotensive.

Table 3 shows that 71.4% of female prehypertensive students had 1 or more CVD risk factors; 32.7% had 1 risk factor, 22.4% had 2 risk factors and 16.3% had 3 or more risk factors. A positive correlation between number of risk factors and BP was also recognized, as 30.0% of hypertensive students and 16.3% of prehypertensive students had 3 or more risk factors compared with only 4.6% of normotensive students ($\chi^2 = 11.79$, Fisher exact $P = 0.047$).

Table 4 reveals that 31.9% of the families of female university students used saturated fat for cooking, as 16.5% used saturated fat only and 15.4% used a combination of saturated and unsaturated fat. It also showed that some of the female students did not eat vegetables or fruits at all (3.0% and 9.5% respectively) and only 45.1% and 28.6% respectively ate them daily. Regarding "fast food" consumption, it was found that 20.9% ate this at least 4 times per week. No significant differences were found between normotensive and prehypertensive or hypertensive students regarding food habits.

Sociodemographic characteristics (age, marital status, mother's education and family income) as well as risk factors (overweight/obesity, physical inactivity, hypercholesterolaemia and family history of hypertension) were included in the logistic regression analysis model. It revealed that overweight/obesity was a significant predictor of prehypertension among female university students, with an odds ratio of 3.34 (95% CI: 1.77–6.30) (Table 5).

Discussion

Several recent studies have reported an increased risk of CVD among prehypertensive people, especially among those with high normal BP. The Framingham Heart Study indicated that men and

Table 3 Number of cardiovascular disease risk factors among female university students by blood pressure group

No. of risk factors	Blood pressure group			Total (n =370)
	Normal (n = 310)	Prehypertension (n = 50)	Hypertension (n = 10)	
	%	%	%	%
0	27.5	28.6	0.0	26.9
1	45.4	32.7	30.0	43.2
2	22.5	22.4	40.0	23.0
3+	4.6	16.3	30.0	6.9

$\chi^2 = 11.79$, Fisher exact $P = 0.047$

women with high normal BP had a more than 2-fold increase in relative risk for CVD compared with those who had optimal BP [8–11]. Prehypertension is associated with subclinical atherosclerosis, including increased coronary atherosclerosis and increased arterial intima-media thickness. In addition, prehypertension is associated with elevated C-reactive protein, tumour necrosis factor α, homocysteine, oxidized low-density lipoprotein cholesterol and other inflammatory markers [9,12,13].

The present study revealed that 13.5% of female university students in Dammam in the Eastern province of Saudi Arabia had prehypertension. A similar study conducted in the same region on male university students recorded a higher prevalence of prehypertension (32.7%) [7]. In comparison 35.8% of Israeli females and 56.8% of males aged 16.5–19 years were considered prehypertensive [14]. Many recent studies conducted in different countries reported similar sex differences. Prehypertension was recognized to be more common among males than females, regardless of age [15–18]. Also, national studies conducted in Saudi Arabia revealed that hypertension was more common among males than females [4,5].

The numerous risk factors for CVD other than hypertension are usually categorized as modifiable (e.g. dyslipidaemia, smoking, diabetes, abdominal obesity, excess alcohol intake and sedentary lifestyle) and non-modifiable (e.g. increasing age, male sex and family history of premature CVD). The rate of these risk factors have been found to be higher in prehypertensive than normotensive subjects, at rates between those with normotension and hypertension [16,19,20]. The present study revealed that the most prevalent risk factor among female university students was physical inactivity, followed by overweight/obesity, family history of hypertension and central obesity. By comparing the prevalence

Table 4 Dietary habits among female university students by blood pressure group

Dietary habit		Blood pressure group			*P*-value
	Total	Normal	Prehypertension	Hypertension	
	No.	%	%	%	
Cooking fat					
Saturated	61	88.7	11.3	0.0	0.162
Unsaturated	252	81.6	15.8	2.6	
Combined	57	83.0	9.4	7.5	
Frequency of vegetable consumption (times/week)					
0	11	81.8	18.2	0.0	0.764
1–6	192	83.2	13.0	3.8	
7+	167	84.6	13.6	1.9	
Frequency of fruit consumption (times/week)					
0	35	82.9	11.4	5.7	0.729
1–6	229	83.2	14.5	2.3	
7+	106	84.6	12.5	2.9	
Frequency of fast food consumption (times/week)					
0	21	90.0	10.0	0.0	0.994
1–3	272	82.8	14.2	3.1	
4+	77	83.8	13.5	2.7	

Table 5 Logistic regression analysis of sociodemographic characteristics and risk factors for prehypertension among female university students

Variable	Risk of prehypertension	
	OR (95% CI)	*P*-value
Age	0.77 (0.41–1.45)	0.419
Marital status	0.70 (0.15–3.28)	0.645
Mother's education	0.86 (0.61–1.22)	0.395
Family income	1.69 (0.82–3.47)	0.153
Physical inactivity	0.77 (0.41–1.45)	0.419
Overweight/obesity	3.34 (1.77– 6.30)	0.001
Family history of hypertension	0.80 (0.40–1.62)	0.541
Hypercholesterolaemia	1.83 (0.21–16.2)	0.589

OR = odds ratio; CI = confidence interval.

of overweight/obesity (29.1%) with similar studies, it was found to be relatively high, as 14% of Israeli and 15% of American adolescent girls were classed as overweight/obese [14,21].

Regression analysis revealed that overweight/obesity was a significant predictor of prehypertension in our study. Similar findings were reported by several other studies [6,14,17,18,22,23]. The association between BP and weight is strong and linear, even in the normal range of BP and BMI [24]. Al-Hazza, who reviewed 3 national cross-sectional studies conducted in Saudi Arabia, reported an increasing prevalence of BMI over time in the adolescent population [25]. Consequently, a rising trend in prevalence of prehypertension is expected among young adults in the coming decades.

In contrast with the results on BMI, central obesity was not associated with high BP in our study. Similar findings were reported by a study conducted on a Japanese population, where the risks for CVD incidence were similar among participants who had the same number of risk factors, with and without abdominal obesity [26].

Certain factors have been shown to be protective against the development of CVD, namely daily consumption of fruits and vegetables and regular physical activity [27]. According to the present study fruits and vegetables were consumed daily by only 28.6% and 45.1% of female university students respectively. However, no relationship was found between high blood pressure and food habits.

Like hypertension, prehypertension tends to cluster with other CVD risk factors. The proportion of prehypertensive individuals with 1 or more risk factor is about 85% [28]. The increased risk of CVD resulting from multiple risk factors is frequently greater than simply additive, indicating a synergistic effect [29]. According to the present study, 71.4% of female prehypertensive university students had at least 1 other risk factor for CVD and 16.3% had 3 or more risk factors.

As with hypertension, prehypertension tends to increase in severity over time. Progression of prehypertension to clinical hypertension depends on the level of BP and age. Yearly measurement of BP in patients with prehypertension is recommended by the JNC-7 to detect and treat hypertension as early as possible [3]. The 2003 European Societies of Hypertension and Cardiology guidelines emphasize the importance of a complete risk assessment for prehypertensive people. The search for other CVD risk factors, e.g. diabetes, obesity or dyslipidaemia, and the presence of target organ damage, e.g. left ventricular hypertrophy, microalbuminuria or increased carotid intima-media thickness, should be encouraged [30]. Japanese guidelines for the management of hypertension published in 2009 consider patients to be in a high-risk group (and requiring antihypertensive therapy) if they have diabetes, chronic kidney disease, 3 or more risk factors, target organ damage or CVD, even if they have only high normal BP [31]. According to JNC-7 the following major lifestyle modifications are recommended for management of prehypertension: weight reduction; the Dietary Approaches to Stop Hypertension (DASH) eating plan, which is rich in potassium and calcium and reduced in total and saturated fat; reduced sodium intake; regular aerobic physical exercise; and moderation of alcohol intake. However, the JNC-7 report recommends drug treatment "if a trial of lifestyle modification fails to reduce BP to 130/80 mm Hg or less" in patients with either diabetes mellitus or chronic kidney disease [3]. Our findings, mainly that overweight/obesity was a major determinant of prehypertension, that physical inactivity was common and that daily consumption of fruits and vegetables was uncommon, indicate that lifestyle modification would probably be the most effective strategy for management of prehypertension among this group of young adult females.

Our study had some limitations, such as random blood glucose testing and assessment of hypercholesterolaemia by history-taking, which may have resulted in underestimation of these risk factors. Therefore it was not always possible to compare our findings with similar studies.

In conclusion, our study demonstrates that prehypertension was prevalent in female university students in Dammam and was associated with multiple CVD risk factors. These results underline the need for routine BP measurements in young adults to identify subjects with prehypertension, who should be the target for annual measurement of BP, assessment for other CVD risk factors and lifestyle modifications.

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Association between modifiable lifestyle factors and inflammatory markers in patients with metabolic syndrome

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الترابط بين عوامل يمكن تعديلها في أنماط الحياة وبين الواسمات الالتهابية في مرضى المتلازمة الاستقلابية

مهدية كل زرند، كرم الله طولابي، مهرانكيز إبراهيمي ممقاني، أكبر علي عسكرزاده، سيد رفيع عارف حسيني

الخلاصة: هناك بيّنات متراكمة تشير إلى أن الالتهاب هو الجسر الذي يربط بين المرض القلبي الوعائي وبين المتلازمة الاستقلابية. وقد أظهرت الدراسات الحديثة وجود علاقة بين الواسمات الالتهابية وبين عدد من أنماط الحياة التي يمكن إدخال تعديلات عليها من قبيل اللياقة البدنية والنظام الغذائي والتمارين الرياضية والتدخين. وقد أجرى الباحثون دراسة مستعرضة شملت 195 مريضاً بالمتلازمة الاستقلابية، فقاموا بجمع المعطيات حول المدخول الغذائي ومستوى النشاط الجسدي وعادات التدخين من خلال استبيان، كما قاموا بتحديد وزن الجسم وتركيبه، وقياس مستويات البروتين المتفاعل – سي والانترلوكين6-، وتبيَّن لهم أن مستوى البروتين المتفاعل – سي يترابط ترابطاً يُعْتَد به إحصائياً بمَنْسَب كتلة الجسم (r = 0.18)، والشَّحَامة (r = 0.33)، والتدخين (r = 0.20)، والمدخول الكربوهيدراتي (r = 0.19)، والحموض الدهنية المشبعة (r = 0.20)، كما كانت ترابطت مستويات الانترلوكين6- ترابُطاً يُعْتَد به إحصائياً بالكربوهيدرات في النظام الغذائي (r = 0.15)، وبالحموض الدهنية المشبعة (r = 0.15)، وبالحمل الغليكوزي (r = 0.15). ولم يلاحظ الباحثون أيَّ ترابُط بين مستوى النشاط الجسمي وبين الواسمات الالتهابية.

ABSTRACT There is accumulating evidence suggesting that inflammation is the bridging link between cardiovascular disease and metabolic syndrome. Recent studies have shown a relationship between inflammatory markers and modifiable lifestyle factors including fitness, diet, exercise and smoking. We carried out a cross-sectional study of 195 patients with metabolic syndrome. Data on nutritional intake, physical activity level and smoking habits were collected through a questionnaire. Weight and body composition were determined and C-reactive protein and interluekin-6 concentrations were measured. C-reactive protein level had a significant association with body mass index (r = 0.18), adiposity (r = 0.23), smoking (r = 0.20), carbohydrate intake (r = 0.19) and saturated fatty acid (r = 0.20). Interluekin-6 concentration was significantly correlated with dietary carbohydrate (r = 0.15), saturated fatty acid (r = 0.15) and glycaemic load (r = 0.15). No association was observed between physical activity level and inflammatory markers.

Association entre les facteurs modifiables liés au mode de vie et les marqueurs inflammatoires chez les patients atteints du syndrome métabolique

RÉSUMÉ Des preuves toujours plus nombreuses semblent indiquer que l'inflammation serait un lien entre les maladies cardio-vasculaires et le syndrome métabolique. Des études récentes ont démontré qu'une relation existait entre les marqueurs inflammatoires et les facteurs de mode de vie modifiables, notamment la forme physique, l'alimentation, l'activité physique et le tabagisme. Nous avons mené une étude transversale sur 195 patients atteints du syndrome métabolique. Des données sur les apports alimentaires, le niveau d'activité physique et les habitudes de consommation de tabac ont été recueillies au moyen d'un questionnaire. Le poids et la taille ont été mesurés et les taux de protéine C-réactive et d'interleukine-6 ont été analysés. Le taux de protéine C-réactive était fortement associé à l'indice de masse corporelle (r = 0,18), l'adiposité (r = 0,23), au tabagisme (r = 0,20), à l'apport glucidique (r = 0,19) et aux acides gras saturés (r = 0,20). Il y avait une corrélation significative entre le taux d'interleukine-6 et la prise de glucides (r = 0,15), d'acides gras saturés (r = 0,15) et la glycémie (r = 0,15). Dans la présente étude, aucune association n'a été observée entre le niveau d'activité physique et les marqueurs inflammatoires.

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Introduction

Metabolic syndrome is a clustering of metabolic disorders including dyslipidaemia, glucose and insulin metabolism disorders, obesity (abdominal obesity) and hypertension, all of which are associated with cardiovascular disease (CVD) [1]. Inflammation is one of the features of metabolic syndrome, which originates from excess visceral adipose tissue [2]. Elevated levels of inflammatory markers are associated with atherosclerosis, and C-reactive protein (CRP) is one of the most sensitive indicators of systemic inflammation [3]. CRP concentration is primarily derived via interleukin-6 (IL-6)-dependent hepatic biosynthesis. IL-6, a major pro-inflammatory cytokine, is produced in a variety of tissues, including activated leukocytes, adipocytes, and endothelial cells [4].

Epidemiological and cross-sectional investigations have demonstrated a strong correlation between inflammatory markers and hyperinsulinaemia, hypertriglyceridaemia, low high-density lipoprotein (HDL)-cholesterol, body mass index (BMI), hypertension, age, and elevated fibrinogen and plasminogen activator inhibitor-1 concentrations [3,5]. Several of the drugs used to treat hyperglycaemia and dyslipidaemia can reduce concentrations of inflammatory markers [1]. Recently, some studies have shown inflammatory markers are associated with lifestyle factors including diet, adipose tissue, physical activity and cigarette smoking [6,7] and have suggested lifestyle modification may reduce the risk of inflammation and CVD [8]. Accordingly, this study was aimed at investigating the association between modifiable lifestyle factors with inflammatory markers in patients with metabolic syndrome in order to gain a better understanding of the factors that cause this phenomenon and prevention of CVD in these individuals.

Methods

Participants

This was a cross-sectional study. Participants were selected by non-random, sequential sampling from the all patients with metabolic syndrome who were referred to the Endocrinology Clinic of Sina Hospital, Tabriz from April 2007 to April 2008. Diagnosis of metabolic syndrome was based on World Health Organization (WHO) criteria [9]: type II diabetes, impaired fasting glucose or insulin resistance plus ≥ 2 of the following: BMI >30 kg/m^2, triglycerides ≥ 150 mg/dL, HDL < 35 mg/dL (men) and 39 mg/dL (women), blood pressure (systolic/diastolic) > 140/90 mmHg and microalbuminuria > 20 μg/min. Exclusion criteria were: pregnancy or lactation; cancer; inflammatory, hepatic or renal disease; and insulin therapy.

After selection, eligible patients were invited to the Endocrinology Clinic of Sina Hospital and the aim of study was explained to them. Two weeks later between June and July 2008, patients who agreed to participate in the study were visited at the same clinic and information on lifestyle factors was collected and blood samples were taken.

From the 291 patients who were eligible for inclusion in the study, 195 agreed to participate. The 96 who refused did so mainly due to their unwillingness to participate.

The study protocol was approved by the Ethics Committee at the Tabriz University of Medical Sciences, and informed consent was obtained from all participants.

Assessments

At the second visit, subjects were interviewed face to face by a trained interviewer using a questionnaire. Physical activity was assessed using a questionnaire from Dixon et al. [10]. Participants who performed physical exercise at least 5 times a week for a minimum of 30 minutes were considered physically active. The design of the smoking questionnaire was based on data obtained from the research of Ohsawa et al. [11]. Those who smoked daily or had stopped smoking for < 5 years were classed as smokers; non-smokers included those who had never smoked and those who had not smoked for ≥ 5 years. Nutritional intake data were collected using a 24-hour dietary recall for 3 days (2 workdays and 1 holiday) by a trained nutritionist and analysed using *Nutrition III* software. At the same time, weight was measured using a scale (Seca, Germany) and height was measured using a tape and BMI was calculated as weight/height^2 (kg/m^2). Those who had BMI < 30 kg/m^2 were defined as non-obese and the rest of them were defined as obese. Body composition was measured using a bioelectric impedance device (TANITA Model TBF-215, Germany). To avoid inter-investigator error, all questionnaires and measurements were obtained by the same person.

Blood samples for measurement of CRP and IL-6 were obtained between 8 am and 11 am. Samples were centrifuged at 2000 g for 15 min and serum samples were stored at –60 °C until assay. CRP concentration was determined by high-sensitivity immunoturbidimetric assay using an auto-analyser (model Alcyon 300 Abbott, USA and Germany) and IL-6 concentration was determined by enzyme-linked immunosorbent assay (ELISA) (STAT FAX, United States of America) at the Drug Applied Research Centre Laboratory of Tabriz University of Medical Sciences.

Statistical analysis

Statistical analysis was performed using *SPSS* software, version 11.5. Variables were tested for normality using histograms and the Kolmogorov–Smirnov test. Data were presented as mean and standard deviation (SD). Association between inflammatory markers and continuous variables (diet composition and anthropometric indices) and

non-continuous variables (smoking habits and physical activity) were tested with linear regression models and chi-squared test, respectively. The difference in CRP and IL-6 concentrations among groups was analysed using independent-sample *t*-test. The level of significance was defined at $P < 0.05$.

Results

The study population included 30.8% men and 69.2% women. Table 1 summarizes the general characteristics of the participants. There were no significant differences in general characteristics (except height) between men and women. The assay showed that 24.6% of participants were in pro-inflammatory status (CRP > 3 mg/L).

Table 2 shows the modifiable lifestyle factors in the study subjects. Women had significantly higher BMI and adiposity compared to men ($P < 0.0001$ for both). Men had significantly higher levels of physical activity ($P < 0.05$) and cigarette smoking habit ($P < 0.01$). There were no significant differences in diet composition.

Figure 1 shows the levels of CRP and IL-6 in obese and non-obese participants, smokers and non-smokers and active and inactive subjects. CRP concentration was statistically significantly higher in obese than non-obese participants [2.6 (SD 2.3) mg/L vs 1.6 (SD 1.5) mg/L] and in smokers than non-smokers [2.3 (SD 2.1) mg/L vs 1.2 (SD 1.0) mg/L]. There were no significant differences in IL-6 concentration for these groups of participants.

Table 3 shows relationships between inflammatory markers and lifestyle factors. BMI ($P < 0.05$), fat mass ($P < 0.01$) and body fat ($P < 0.001$) were significantly associated with CRP level. There were also statistically significant associations between CRP concentration and dietary intake of carbohydrate ($P < 0.01$) and saturated fatty acids ($P < 0.01$). Similar trends were seen between IL-6 level and dietary intake of carbohydrate ($P < 0.05$), saturated fatty acids ($P < 0.05$) and glycaemic load (GL) ($P < 0.05$). There were inverse associations between CRP level and dietary intake of monounsaturated fatty acids and polyunsaturated fatty acids, but these were not statistically significant. No relationship was observed between CRP concentration or IL-6 concentration and dietary fat, protein and glycaemic index (GI). CRP level, but not IL-6 level, was statistically significantly associated with cigarette smoking ($P < 0.05$).

Discussion

Our study was conducted to assess association of inflammatory markers and modifiable lifestyle factors. As expected, CRP level had a positive correlation with adiposity, a finding confirmed by others [12,13]. Ruiz et al. [13] showed that adipose tissue has the greatest influence on CRP concentration. Adipose tissue is a source of pro-inflammatory cytokines such as tumour necrosis factor-α (TNF-α) and IL-6 [14]. Approximately 25% of basal circulating IL-6 is produced by adipose tissue especially intra-abdominal fat. IL-6 is the main regulator of synthesis of CRP by the liver. Van Ree et al. showed that CRP mRNA, is also expressed in human subcutaneous abdominal adipose tissue. These findings suggest adipose tissue as an important determinant of basal CRP levels [15].

Significant associations between dietary carbohydrate and saturated fatty acid intake and CRP and IL-6 concentrations were observed in the present study. Our findings suggested that

Table 1 Characteristics of the participants

Characteristic	Total	Men	Women	*P*
	Mean (SD)	Mean (SD)	Mean (SD)	
Age (years)	56.0 (11.7)	59.2 (13.9)	54.6 (10.7)	0.08
Weight (kg)	76.5 (12.2)	77.9 (14.6)	76.3 (11.0)	0.38
Height (cm)	159.0 (8.0)	167.0 (6.9)	155.4 (5.4)	< 0.001
FBS (mg/dL)	181.4 (75.6)	172.3 (64.6)	185.6 (79.4)	0.25
TC (mg/dL)	203.8 (69.0)	196.2 (30.7)	207.8 (79.0)	0.34
HDL-C (mg/dL)	45.2 (16.7)	42.5 (13.6)	46.4 (17.0)	0.42
LDL-C (mg/dL)	103.3 (43.5)	101.0 (32.8)	104.4 (47.8)	0.61
TG (mg/dL)	260.7 (182.3)	233.4 (140.6)	273.1 (196.3)	0.16
SBP (mmHg)	153.2 (19.7)	151.6 (17.9)	154.3 (20.3)	0.38
DBP (mmHg)	89.9 (13.7)	88.9 (10.2)	90.4 (15.0)	0.48
CRP (mg/L)	2.1 (2.0)	1.9 (1.8)	2.5 (2.2)	0.07
IL-6 (pg/mL)	3.5 (3.7)	3.6 (3.2)	3.4 (3.3)	0.83

FBS = fasting blood sugar; TC = total cholesterol; HDL-C = high density lipoprotein-cholesterol; LDL-C = low density lipoprotein-cholesterol; TG = triglyceride; SBP = systolic blood pressure; DBP = diastolic blood pressure, CRP = C-reactive protein; IL-6 = interleukin-6.
SD = standard deviation.

Table 2 Modifiable lifestyle factors

Modifiable lifestyle factor	Total	Men	Women	*P*
	Mean (SD)	Mean (SD)	Mean (SD)	
BMI (kg/m²)	30.4 (4.8)	27.9 (4.9)	31.5 (4.3)	< 0.001
Fat mass (kg)	26.8 (9.7)	20.4 (11.2)	29.6 (7.5)	< 0.001
Body fat (%)	34.2 (9.1)	25.1 (10.0)	38.2 (4.7)	< 0.001
Carbohydrate (g)	204.4 (112.0)	203.7 (56.5)	204.8 (101.8)	0.94
Protein (g)	59.9 (27.8)	61.3 (25.5)	59.3 (28.8)	0.65
Fat (g)	77.3 (25.6)	82.5 (26.5)	74.9 (24.9)	0.06
SFA (g)	16.8 (6.6)	18.8 (6.8)	15.9 (7.3)	0.08
MUFA (g)	24.9 (9.9)	26.9 (11.8)	24.1 (8.8)	0.10
PUFA (g)	19.6 (9.1)	21.3 (10.6)	18.9 (8.3)	0.12
Fibre (g)	6.7 (5.6)	7.2 (6.1)	6.5 (5.3)	0.42
Glycaemic index (%)	59.6 (12.5)	56.3 (21.0)	61.1 (4.9)	0.08
Glycaemic load (g)	112.5 (79.6)	116.4 (34.8)	103.5 (67.9)	0.06
	%	%	%	
Smoker	23.1	28.9	10.0	0.001
Non-smoker	76.9	71.1	90.0	0.001
Physically active	7.7	15.0	4.4	0.03
Not physically active	92.3	85.0	95.6	0.03

BMI = body mass index; SFA = saturated fatty acid; MUFA = monounsaturated fatty acid; PUFA = polyunsaturated fatty acid.
SD = standard deviation.

dietary composition might influence inflammatory markers. Several investigations have compared the effect of dietary carbohydrate on concentration of inflammatory markers. One study found no association between diet compositions and serum CRP [6]; another found that a low-carbohydrate diet increased serum CRP [16]. In a third study, the effect of low-carbohydrate diet on CRP concentration was consistent with our own observations [17]. Low-carbohydrate diets are high in fat and low in dietary antioxidants, which may increase susceptibility to oxidative stress and this would subsequently increase inflammation [16]. Nevertheless, the increase in CRP and IL-6 levels with high-carbohydrate diets may be a result of low fibre intake. In the present study, dietary fibre intake was very low, however, no significant association with anti-inflammatory markers was found. Some previous studies have, however, shown that high fibre diets can decrease inflammatory markers [18,19].

Another possible reason for an increase in inflammatory markers with high-carbohydrate diets could be that such diets have high GI and high GL. Our findings have shown that IL-6 has significant positive association with a high GL diet. This finding is supported by a previous study which demonstrated that diets with high GI and high GL can cause a rise in inflammatory indicators [20]. Consumption of high GI diets was associated with production of pro-inflammatory mediators and a reduction in anti-inflammatory markers, leading to activation of the inflammatory process.

Type of dietary fat can also influence plasma and tissue fatty acid composition which can modify inflammation process. Aeberli et al. [21] have shown high saturated fatty acid intakes induced rising plasma levels of free saturated fatty acids, especially palmitic acid lead to impairing glucose and lipid metabolism and inducing expression of proinflammatory cytokines in adipocytes, skeletal muscle cells, and endothelial cells. *In vivo*, palmitic acid correlates with IL-6 concentrations, independent of adipose tissue. It has been supposed that high saturated fatty acids intakes of may stimulate IL-6 secretion. Although the effects of dietary compositions on CRP levels have not been fully elucidated, epidemiological studies have shown diet high in fruits, vegetables, grains and fibre are associated with lower CRP levels while diets high in trans-fatty acids and high GL diets are associated with higher CRP levels [16]. Clinical trials are needed to confirm the effect of dietary manipulation on serum CRP.

In the present study, we found no association between CRP or IL-6 concentrations and physical activity. Previous findings that examined the relationship between exercise and inflammatory markers are controversial. Some have demonstrated the beneficial effects of exercise on inflammation [22,23], whereas others, consistent with the results of the present study, reported physical activity having no correlation with inflammatory markers [24,25]. A

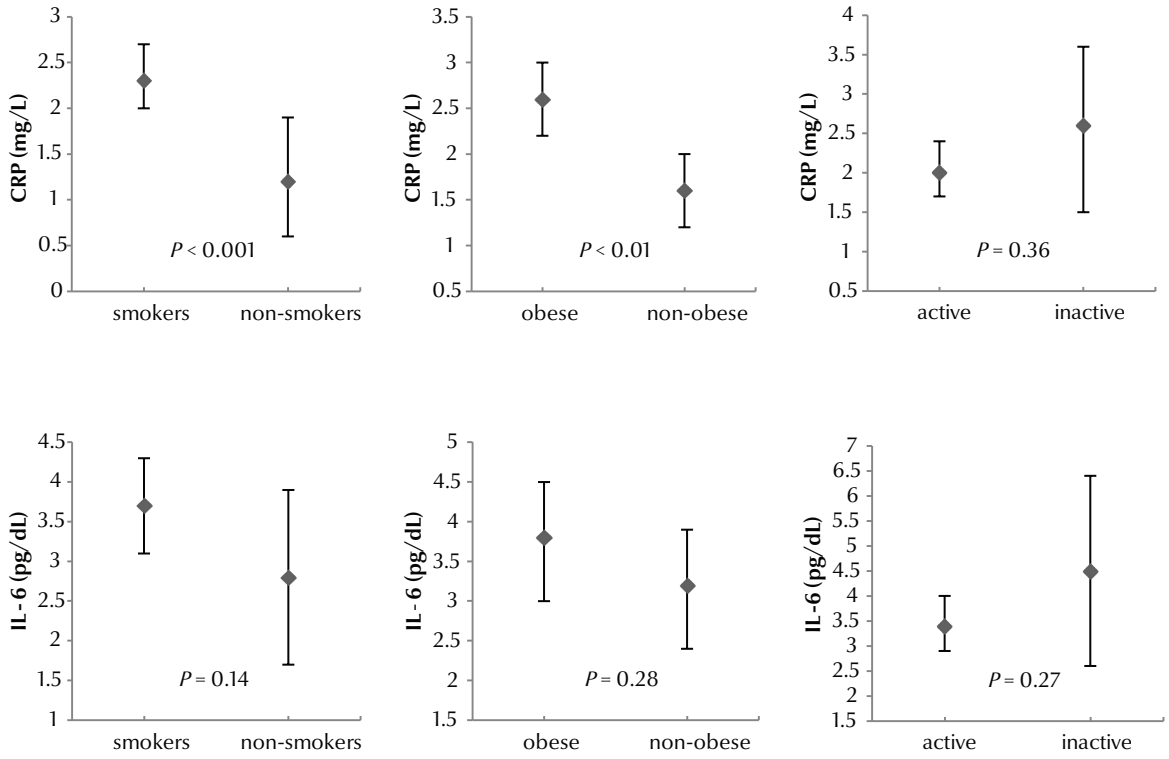

Figure 1 **Mean C-reactive protein (CRP) and interleukin-6 (IL-6) levels according to obesity, smoking habits and physical activity**

possible explanation for inconsistent association between physical activity and inflammatory markers is that physical questionnaire used was not sensitive enough in this respect. Recently, Balducci et al. [23] have shown VO_2max is a strong predictor of CRP level, independent of body weight. Accordingly, direct measurement of VO_2max in a laboratory may results in accurate value of aerobic fitness and lead to a different association with inflammatory marker concentrations. Therefore, further investigations are advisable.

We found a positive association between serum CRP and smoking. This is in agreement with the findings of previous studies [26–28]. Smoking is a major modifiable risk factor for CVD and by producing a state of inflammation promotes atherosclerosis. Several studies have assessed the mechanisms responsible for the positive relationship between smoking and elevated inflammatory indices: it has been shown smoking increases gene expression and serum concentration of IL-6 [26]. Elevated IL-6 level leads to raised CRP concentration and inflammation initiation. Another study reported that smoking causes release of interleukin-6 from visceral adipose tissue, which results in increased CRP production by hepatocytes [27]. However, in a related study it was suggested that cigarette smoking, via tissue damage, caused an inflammatory stimulus and increased CRP level [28]. In our study, we did not

Table 3 **Association between inflammatory markers and lifestyle factors**

Lifestyle factor	C-reactive protein		Interleukin-6	
	r	*P*	*r*	*P*
BMI	0.18	0.011	0.02	0.659
Fat mass	0.23	0.002	0.07	0.281
Body fat	0.27	0.000	0.09	0.205
Carbohydrate	0.19	0.009	0.15	0.034
Protein	0.10	0.098	0.13	0.076
Fat	0.03	0.598	–0.01	0.822
SFA	0.20	0.005	0.15	0.034
MUFA	–0.13	0.060	–0.11	0.110
PUFA	–0.13	0.069	–0.07	0.275
Glycaemic index	0.06	0.400	0.09	0.180
Glycaemic load	0.11	0.133	0.15	0.030
Smoking	0.20	0.000	0.06	0.640
Physical activity	0.11	0.109	0.10	0.099

BMI = body mass index; SFA = saturated fatty acid; MUFA = monounsaturated fatty acid; PUFA = polyunsaturated fatty acid.

consider ex-smokers as a separate group due to the small numbers, so we could not assess the association between inflammatory marker levels and smoking cessation. However, other studies have shown smoking cessation reduces inflammatory markers but their levels do not fall to normal [28,29]. Therefore, our results reinforce the need to encourage smoking cessation as early as possible.

This study had several limitations. Because it was cross-sectional, the directionality of the reported associations could not be established. The sample size may not have been large enough to identify minor association between CRP and IL-6 and lifestyle factors. Besides this, the relatively low response rate may have affected the relationship between inflammatory markers and lifestyle factors. We used 24-hour dietary recall for assessment of nutritional intake. This relies on the participants' memory, and they may underestimate dietary intake. Therefore, it may affect the observed correlation between inflammatory markers and diet composition. Concurrent application of other dietary assessment tools such as food record with 24-hour dietary recall for correct estimation of dietary intake is important. The number of cigarettes smoked per day and duration of smoking were not considered. Inflammatory marker levels in ex-smokers were not evaluated. So it was not possible to conclude any associations between inflammatory markers and these lifestyle factors. Additionally, the use of a single fasting measurement of CRP and IL-6 may not necessarily reflect chronic inflammatory status.

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International conference on healthy lifestyles and noncommunicable diseases in the Arab World and Middle East, 10–12 September 2012

The Ministry of Health of Saudi Arabia, in collaboration with the WHO Regional Office for the Eastern Mediterranean, is organizing an international conference focusing on the implementation of the UN Political Declaration on Noncommunicable Diseases in the Region. Representatives from ministries of health, foreign affairs and planning, the League of Arab States, United Nations funding agencies, programmes and agencies, international financial institutions, development banks and other key international organizations are expected to attend.

The aims of the conference are to:

- review and adopt a set of monitoring indicators for noncommunicable disease surveillance systems
- share strategies, tools and cost-effective interventions that countries in the Region may have implemented in relation to surveillance, prevention and improved health care for noncommunicable diseases
- articulate a road map for capacity-building for the Region based on a review of current regional and national capacities
- discuss and adopt a research agenda concerning noncommunicable disease priority areas in the Region.

Further information about the work of WHO/EMRO with regard to noncommunicable diseases is available at: http://www.emro.who.int/entity/noncommunicable-diseases/

معارف وممارسات النساء في الجامعات العراقية حول الفحص الذاتي للثدي

ندى عبد الصاحب العلوان[1]، وفاء محمد العطار[2]، رغدة العيسى [2]، زيد المدفعي[2]، فرات نضال[2]

Knowledge and practices of women in Iraqi universities on breast self examination

ABSTRACT This study evaluated the knowledge and practice of breast self-examination (BSE), among a sample of educated Iraqi women. The study sample comprised 858 women aged 18–62 years affiliated to 6 major Iraqi universities, categorized according to occupation as teaching staff (11.5%), administrative staff (18.0%) and students (70.5%). Data were collected by a self-completed questionnaire. In all, 93.9% of the women had heard about BSE, the main source of information was television (39.9%), doctors (18.4%) and the awareness campaign of the Iraqi National Breast Cancer Research Programme (11.6%). Only 53.9% of the women practised BSE; the most common excuses by those that did not were lack of knowledge of the significance of BSE (42.0%) and lack of confidence in their ability to perform BSE (39.5%). Just over 38% did not seek medical advice if they experienced signs/symptoms of breast disease, attributing that to reasons of timidity, lack of time or fear of discovering cancer. The majority (88%) of the women were willing to instruct others in BSE (after training), 40% of whom were interested in collaborating with the National Breast Cancer Awareness Programme in Iraq.

الخلاصة: قيّمت هذه الدارسة المعارف والممارسات تجاه الفحص الذاتي للثدي بين عينة من النساء العراقيات المثقفات. شَمَلَتْ عينة البحث 858 امرأة في الفئة العمرية (62-18 سنة) من المنتسبات إلى ست جامعات عراقية كبرى، وجرى تقسيم المشاركات بحسب وظيفتهن إلى عضوات في هيئة التدريس (11.5٪)، وموظفات (18٪)، وطالبات (70.5٪). وجُمِعت المعطيات عن طريق استبيان تجيب عليه المشاركات ذاتياً. وتبين أن 93.9٪ من المشتركات قد سمعن عن الفحص الذاتي للثدي؛ وكان المصدر الرئيسي لمعلوماتهن هو التلفزيون (39.9٪)، ثم الأطباء (18.4٪)، ثم حملات التوعية التابعة للبرنامج العراقي الوطني لبحوث سرطان الثدي (11.6٪). وتبين أن 53.9٪ فقط من المشتركات تمارسن بالفعل هذا الفحص؛ وكان أكثر الأعذار التي بررت بها باقي المشاركات (46.1٪) عدم إجرائهن للفحص هي عدم المعرفة بأهمية وطريقة الفحص الذاتي للثدي (42٪)، وعدم الثقة في قدرتهن على إجراء الفحص (39.5٪). كما تبين أن ما يزيد بقليل عن 38٪ من المشتركات لم يطلبن النصيحة الطبية عندما لاحظن وجود علامات وأعراض منذرة بمرض الثدي، وبرَّرن ذلك بأسباب من قبيل الخجل، وعدم وجود الوقت الكافي، والخوف من اكتشاف إصابتهن بالسرطان. وأظهرت 88٪ من المشاركات في عينة الدراسة رغبة صادقة في الحصول على النصح من الأخريات حول طريقة إجراء الفحص الذاتي للثدي (بعد التدرّب عليه)، وأن 40٪ منهن كن مهتمات بالتعاون مع البرنامج الوطني الريادي لبحوث السرطان لترويج التوعية الجماهيرية حول المرض في العراق.

Connaissances et pratiques des femmes fréquentant des universités iraquiennes concernant l'auto-examen des seins

RESUME La présente étude a évalué les connaissances et les pratiques en matière d'auto-examen des seins d'un échantillon de femmes iraquiennes instruites. L'échantillon de l'étude comprenait 858 femmes âgées de 18 à 62 ans fréquentant six grandes universités iraquiennes. Les participantes ont été classées en fonction de leur activité, soit comme personnel enseignant (11,5 %), soit comme personnel administratif (18,0 %), soit comme étudiante (70,5 %). Des données ont été recueillies à l'aide d'un auto-questionnaire. Globalement, 93,9 % des femmes avaient entendu parler de l'auto-examen des seins. Leur principale source d'information était la télévision (39,9 %), les médecins (18,4 %) et la campagne de sensibilisation du programme national de recherche sur le cancer du sein en Iraq (11,6 %). Seules 53,9 % des femmes pratiquaient l'auto-examen des seins ; les excuses les plus fréquentes de celles qui ne le faisaient pas étaient la méconnaissance de l'importance de l'examen (42,0 %) et le manque de confiance en leur capacité à le réaliser (39,5 %). À peine plus de 38 % des femmes s'abstenaient de consulter un professionnel de santé lorsqu'elles percevaient des signes/des symptômes de pathologie mammaire, en raison, selon elles, de leur timidité, d'un manque de temps ou par crainte de découvrir un cancer. La majorité des femmes (88 %) étaient volontaires pour enseigner à d'autres l'auto-examen des seins (après une formation). Parmi celles-ci, 40 % étaient intéressées par une collaboration avec le programme national iraquien de sensibilisation au cancer du sein.

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الاستلام: 11/5/10، القبول: 11/10/5

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المقدمة

تدلُّ التقديرات الأخيرة لمنظمة الصحة العالمية على أن السرطان هو أحد الأسباب الرئيسية المؤدية إلى الوفاة بين البالغين في العالم، وكذلك في بلدان إقليم شرق المتوسط، وأن من المتوقع أن تزداد خطورة السرطان على مر السنين ليكون في طليعة المشاكل الصحية، حيث سيأخذ بالتزايد والانتشار مع تقدم السكان في العمر وتكاثرهم في العدد. كما بينت الدراسات العالمية أن أربعين في المئة من الوفيات الناجمة عن السرطان يمكن تَوَقِّيها إذا انخفض تعاطي التبغ، والكحول، وتحسَّنت التغذية، وزاد النشاط البدني وتم التخلص من العوامل المسرطنة في مكان العمل. كما أن قطاعاً كبيراً من حالات السرطان يمكن شفاؤها إذا ما اكتشفت في مراحل مبكرة ولاسيّما إذا خضعت إلى تدبير علاجي فعال [1]، و يأتي سرطان الثدي في مقدمة السرطانات التي يمكن مكافحتها بالكشف المبكر.

ويعتبر سرطان الثدي من أكثر السرطانات شيوعاً عند الإناث في العالم بصورة عامة وفي إقليم شرق المتوسط والعراق بصورة خاصة، حيث تبلغ نسبة الإصابة به 23٪ من مجموع السرطانات التي تصاب بها المرأة في العالم، وعلى الرغم من اعتقاد البعض أنّ ذلك السرطان هو من أمراض العالم المتقدّم، إلا أنّ معظم الوفيات الناجمة عنه (69٪) تحدث في البلدان النامية [2]. كما أن معدلات بُقْيَا مرضى سرطان الثدي على قيد الحياة تتراوح بين 80٪ أو أكثر في أمريكا الشمالية والسويد واليابان، و60٪ في البلدان المتوسطة الدخل، وأقلّ من 40٪ في البلدان المنخفضة الدخل .[3] وفي العراق، يمثل سرطان الثدي حوالي ثلث نسبة السرطانات التي أصيبت بها المرأة العراقية (32٪) وفقاً لما هو مدون في سجل السرطان العراقي الأخير الذي يبين أن سرطان الثدي يحتل المرتبة الأولى بين السرطانات التي يصاب بها الفرد العراقي [4]. كما لوحظ خلال السنوات الأخيرة تزايد واضح في نسبة الإصابة بهذا المرض، حيث بينت الإحصائيات والدراسات المحلية أن معظم الحالات التي تصيب المرأة العراقية، عادةً ما تُكتشف في مراحل متأخرة يصعب التحكم فيها بواسطة العلاج، وأن كثيراً من ضحايا هذا المرض هن في مقتبل العمر [4, 5]، وهذه حالة نادرة الحدوث في المجتمعات والدول الغربية.

ومن أهمّ الاستراتيجيات السكانية للكشف المبكر عن سرطان الثدي إذكاء الوعي العام بالمشكلة التي يطرحها هذا المرض، وبآليات مكافحته، والدعوة إلى وضع السياسات والبرامج المناسبة في هذا المجال. ولذا فقد بادرت وزارة التعليم العالي والبحث العلمي باستحداث برنامج وطني ريادي لبحوث السرطان، يستهدف توعية النساء من كافة أوساط الشعب العراقي بمرض السرطان بصورة عامة، وسرطان الثدي بصورة خاصة، إلى جانب إجراء الدراسات والبحوث حوله، وتدريب الكوادر الطبية والعاملين في الحقل الصحي على التقنيات المستخدمة عالمياً في الكشف المبكر عن سرطان الثدي، والتي تشمل طريقة الفحص السريري والذاتي للثدي، والفحص الشعاعي، والتشخيص الخلوي بواسطة الرشف بالإبرة الدقيقة.

وقد اعتمدت هذه الدراسة الاستطلاعية على المعلومات المسجلة في قاعدة بيانات البرنامج الوطني الريادي لبحوث السرطان، والتي توثق النشاطات المختلفة من خلال الندوات الوطنية التي نظمتها إدارة البرنامج في الجامعات العراقية بالتعاون مع وحدة بحوث سرطانَيْ الثدي وعنق الرحم في كلية طب جامعة بغداد. وتهدف الدراسة إلى تقييم مستوى معارف وممارسات عينة من المثقفات في الجامعات العراقية (مُدرِّسات وموظفات وطالبات) في ما يتعلَّق بالفحص الذاتي للثدي، والتحري عن وجود علاقة واضحة بين المهنة وبين مستوى المعرفة.

منهجية البحث

شاركت في هذه الدراسة عينة تتألف من (858) امرأة، تراوحت أعمارهن بين (18–62) سنة، من الجامعات والكليات العراقية وشَمَلت:

جامعة بغداد/ كلية الطب: 131(15.3٪)
جامعة بغداد/ كلية التمريض:85(9.9٪)
الجامعة المستنصرية:116(13.5٪)
جامعة الكوفة:180(21.0٪)
جامعة النهرين:47(5.5٪)
جامعة كركوك: 256(30.0٪)
جامعة هولير الطبية:43(5.0٪)

وقد تم تقسيم المشاركات بحسب المهنة، في الجامعات، إلى ثلاث مجموعات تضم المدرِّسات (98 = 11.5٪) والموظفات (154 = 18٪) والطالبات (602 = 70.5٪). وتم جمع المعلومات المطلوبة من تلك العينة البحثية من خلال ما تم توثيقه في استمارات استبيان، أعدَّت لتلك الدراسة من قِبَل إدارة البرنامج الوطني الريادي لبحوث السرطان ووحدة بحوث الكشف المبكر عن سرطانَيْ الثدي وعنق الرحم، تمّ توزيعها على المشاركات واستكملن مَلأْها أثناء ندوات التوعية الوطنية الخاصة بحملة الكشف المبكر عن سرطان الثدي، والتي نفذت في المدَّة ما بين 14/ 10/ 2010 إلى 11/ 5/ 2011.

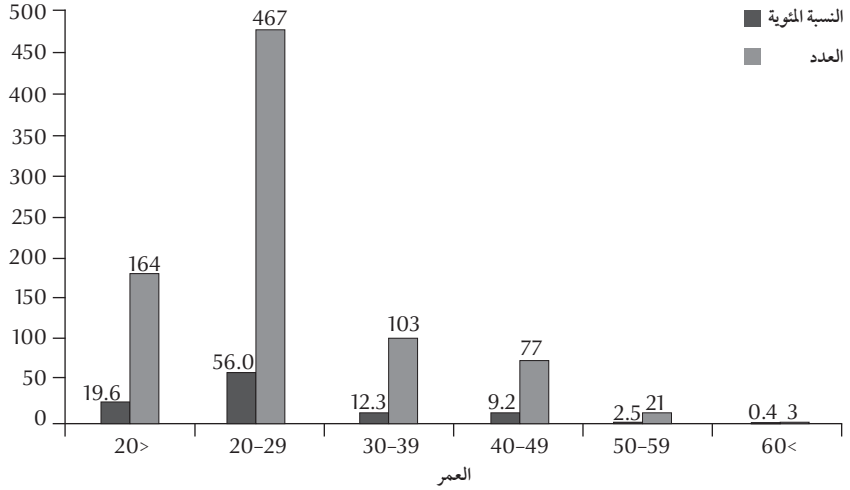
وتضمنت البيانات الموثَّقة معلومات شخصية وديموغرافية إضافة إلى أسئلة حول معارف وممارسات المرأة العراقية حول الفحص الذاتي للثدي. ومن الجدير بالذكر أنه قد تم حصر الوقت المحدد للإجابة في فترة زمنية لا تتجاوز عشر دقائق، جَرَى بعدها جمع الاستمارات الاستبيانية من المشاركات قبل البدء بإلقاء محاضرة الندوة الخاصة بالتوعية حول أهمية الكشف المبكر عن سرطان الثدي. ومن ثمَّ تمَّ فرز المعلومات وتحليلها إحصائياً باستخدام التكرارات والنسب المئوية واحتساب مربع كـاي.

النتائج

أوضحت نتائج البحث أن أعمار الإناث المشاركات في الدراسة كانت تتراوح ما بين (18–62) سنة، وقد شكلت الفئة العمرية (20–29 سنة) النسبة الكُبْرَى منهن (56٪ من المجموع الكلي)، تَلَتْها الفئة العمرية (أقل من 20 سنة) والتي شكلت 20.6٪ بينما مثَّلت الفئة (60 سنة فما فوق) 0.4٪ فقط.

يبين الجدول (1) توزيع العينة بحسب الجامعات العراقية، والتي شملت بعض محافظات الوسط والشمال، حيث يلاحظ بأن جامعة كركوك مثلت 29.8٪ تلتها جامعة الكوفة (21٪) ثم جامعة بغداد/ كلية الطب (15.3٪) والجامعة المستنصرية (13.6٪). كما يبين هذا الجدول أن الطالبات شكَّلنَ (70.5٪) من المجموع الكلي، يلي ذلك الموظفات (18٪) ثم المدرسات (11.5٪).

يبين هذا الجدول الإجابات المختلفة حول سؤال: هل سمعت بالفحص الذاتي للثدي؟ وما هو مصدر المعلومة الجدول (2)؟ إن نسبة جيدة جداً من المشاركات (93.9٪) قد سمعن بالفحص الذاتي للثدي، بينما 6.1٪ فقط منهن لم يسمعن به، كما يلاحظ عدم وجود علاقة



الشكل 1 توزيع العينة بحسب الفئات العمرية.

إحصائية بين المهنة وبين الإجابة بـ"نعم" أو "لا". وأظهرت النتائج أن التلفاز هو المصدر الرئيسي لاكتساب المعلومات حول سرطان الثدي لدى (39.9٪)، ويليه الطبيب (18.4٪)، ثم البرنامج الوطني الريادي لبحوث السرطان (11.6٪) ثم الصحف والمجلات (11.5٪)، ثم المَطْوِيَّات (الفولدرات) والملصقات (البوسترات) (10٪)، ثم المراكز الصحية (5.3٪)، وأخيراً الإذاعة (3.3٪).

يبين الجدول (3) أن هناك علاقة إحصائية واضحة بين المهنة والإجابة بـ"نعم" "عند القائمات بالفحص الذاتي للثدي ($P < 0.05$)، حيث أظهرت النتائج أن 53.9٪ من المشاركات كُنَّ يمارسن الفحص الذاتي للثدي وأغلبهن من المدرِّسات (69.1٪) تليهن الموظفات (56.8٪) بينما كانت مجموعة الطالبات هي الأقل (51٪). ووجد أن السبب الرئيسي وراء عدم القيام بالفحص الذاتي للثدي في العينة المتبقية والتي تمثل 46.1٪ هو "عدم المعرفة بالطريقة الصحيحة للفحص" (42٪) أو "عدم الثقة بإجادة الفحص" (39.5٪) أو"الخوف من اكتشاف عقدة في الثدي" (16.4٪)، بينما صرحت 1.9٪ فقط من المشاركات "بعدم الاقتناع بجدوى الفحص".

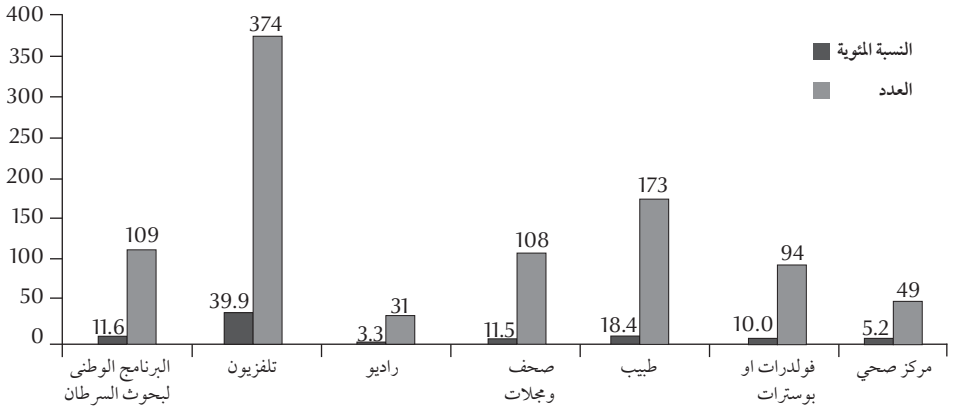
يبيِّن الجدول (4) أن اختبار مربع كاى أثبت أن هناك علاقة إحصائية بين المهنة وبين القيام بزيارة الطبيب في حال الشعور بألم أو ورم في الثدي ($P < 0.05$)، حيث يتبيَّن من الجدول أن 61.7٪ من المشاركات بالدراسة يقمن بزيارة الطبيب، وأغلبهن من المدرِّسات (80.5٪)، بينما شكَّلت اللواتي يمتنعن عن زيارة الطبيب 38.3٪ من المجموع الكلي، وكان أغلبهن من الطالبات (44.6٪). وكان السبب الرئيسي وراء الامتناع عن زيارة الطبيب هو "الخجل" في 58 (56.9٪)، ويلي ذلك "عدم وجود الوقت الكافي" في 38 (37.3٪) ثم "الخوف" في 6 (5.6٪) وذلك من مجموع مَنْ أَجَبْنَ بـ "لا".

كشف الجدول (5) أن 88.1٪ من المشاركات في الدراسة أظهرنَ استعداداً لتعليم قريباتهنَّ وزميلاتهنَّ الطريقة الصحيحة للفحص الذاتي للثدي إذا تمَّ إرشادهنَّ إلى ذلك، في حين امتنعت عن ذلك 11.9٪ من المشاركات. ولم يظهر اختبار مربع كاى وجود أية علاقة إحصائية بين المهنة وبين الإجابة ($P > 0.05$). وكانت الأعذار الرئيسية عند الفئة التي لم تُبْدِ اهتماماً بتعليم الأُخرَيَات هي إما "عدم وجود الوقت الكافي"

الجدول 1 توزيع العينة وفقاً للمهنة في الجامعات والكليات المشمولة بالدراسة

ت	الجامعة/ الكلية	المدرِّسات		الموظفات		الطالبات		المجموع	
		العدد	%	العدد	%	العدد	%	العدد	%
1	جامعة بغداد/ كلية الطب	7	5.3	8	6.11	116	88.6	131	15.3
2	الجامعة المستنصرية	9	7.8	58	50.0	49	42.2	116	13.6
3	جامعة النهرين	1	2.1	36	76.5	10	21.3	47	5.5
4	جامعة بغداد/ كلية التمريض	43	51.2	10	11.9	31	36.9	84	9.8
5	جامعة الكوفة	7	3.9	13	7.3	159	88.8	179	21.0
6	جامعة كركوك	13	5.1	13	5.1	230	89.8	256	30.0
7	جامعة هولير الطبية/ اربيل	18	44.0	16	39.0	7	17.0	41	4.8
	المجموع	98	11.5	154	18.0	602	70.5	854	100

* أُهملت أربع استمارات لعدم مطابقتها لشروط ملء الاستبيان.



الشكل 2 مصادر المعرفة عند النساء المشمولات بالبحث حول الفحص الذاتي للثدي.

الجدول 2 هل سمعت سابقاً بالفحص الذاتي للثدي؟ إذا كانت الإجابة بـ"نعم" فما هو مصدر المعلومة؟

ت	المهنة	نعم		لا		المجموع		الاحتمالية
		العدد	%	العدد	%	العدد	%	
1	المدرِّسات	82	96.4	3	3.5	85	11.3	$P > 0.05$ لا يُعتدُّ بها إحصائياً
2	الموظفات	116	89.9	13	10.0	129	17.2	
3	الطالبات	507	94.4	30	5.6	537	71.5	
	المجموع[a]	705	93.9	46	6.1	751	100	

[a] أهملت *107* استمارة لعدم مطابقتها لشروط ملء الاستبيان.

(68.2٪ من مجموع الإجابة بـ لا) ومعظمهن من الطالبات وإما أن "الأمر لا يعنيهن"(31.8٪)".

ومن الجدير بالذكر أن 345 امرأة (40.4٪) من مجموع النساء المشاركات في الدراسة أَعْرَبْنَ عن رغبتهنَّ في الانضمام إلى البرنامج الوطني الريادي للكشف المبكر عن السرطان والتعاون معه في مجال مكافحة سرطان الثدي: منهن 36 مدرِّسة (36.7٪ من مجموع المدرِّسات)، و65 موظفة (42.2٪ من مجموع الموظفات) و244 طالبة (40.3٪ من مجموع الطالبات).

المناقشة

تسعى منظمة الصحة العالمية إلى تعزيز مكافحة سرطان الثدي في إطار البرامج الوطنية الشاملة لمكافحة السرطان والتي تنطوي على الوقاية والكشف المبكّر والعلاج والرعاية الملطفة [6]. وعلى الرغم من إمكانية إسهام الاستراتيجيات الوقائية في الحدّ من بعض مخاطر سرطان الثدي، إلا أنها لا تمكّن من التخلّص من معظم الحالات. وينطبق ذلك تحديداً على البلدان النامية التي تشهد ارتفاعاً في معدلات الإصابة بهذا المرض [2] نتيجة زيادة متوسط العمر المأمول واعتماد أنماط الحياة الغربية التي عادة ما يشخص فيها داء السرطان في مراحل متأخّرة [1,7,8]. وبناء عليه فإنّ الكشف المبكّر يظلّ حجر الزاوية لمكافحة سرطان الثدي وتحسين معدلات البُقْيَا على قيد الحياة. وثَمَّةَ بعض البيّنات على إمكانية إسهام استراتيجية الكشف المبكر في "تَرَاجُع" زيادة نسبة حالات سرطان الثدي إلى مراحل أكثر قابلية للشفاء عن طريق العلاج [6–8].

ولما كان التصوير الشعاعي للثدي، وهو أحد أبرز وسائل الكشف المبكر عن سرطان الثدي،

الجدول 3 هل تقومين بفحص ثدييك بنفسك؟ إذا كانت الإجابة بـ"لا" فلماذا؟

ت	المهنة	نعم		لا		المجموع		الاحتمالية
		العدد	%	العدد	%	العدد	%	
1	المدرِّسات	56	69.1	25	30.8	81	10.4	23.99 $P < 0.05$ يُعتدُّ بها إحصائياً
2	الموظفات	71	56.8	54	43.2	125	16.1	
3	الطالبات	292	51.0	280	49.0	572	73.5	
	المجموع[a]	419	53.9	359	46.1	778	100	

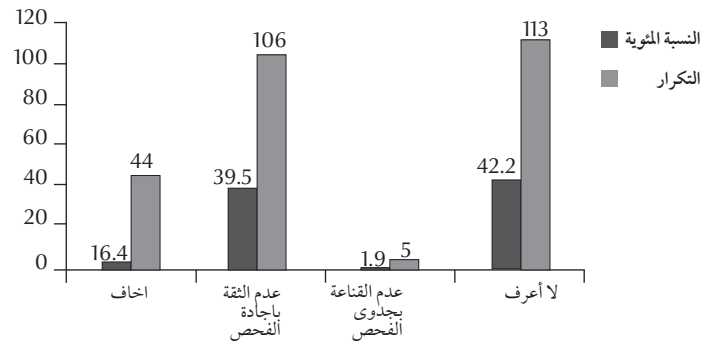
[a] أُهملت 80 استمارة لعدم مطابقتها لشروط ملء الاستبيان.

مرتفعَ التكلفة، فإنه لا يوصَى باللجوء إليه إلا في البلدان التي تمتلك بنية صحية أساسية جيّدة تمكنها من تحمّل تكاليف تنفيذ البرنامج على المدى البعيد. ولذلك تنصح منظمة الصحة العالمية النساءَ في بلدان العالم النامية بالتفطّن إلى العلامات والأعراض الأولى للمرض وذلك من خلال الفحص السريري للثدي الذي يجريه الطبيب، والفحص الذاتي للثدي، كما تؤكد المنظمة أن من العوامل الأساسية لإنجاح استراتيجية الكشف المبكّر عن السرطان: وضع خطط دقيقة لتنفيذ برنامج مستمر ومنتظم غايتُه الارتقاء بمستوى الوعي العام بالمشكلة التي يطرحها هذا المرض، وهو برنامج يستهدف الفئة السكانية المناسبة، ويضمن تنسيق الإجراءات وجودتها على جميع مستويات الرعاية [1, 6].

وتحقيقاً لتلك الغاية، التي تعتبر من أبرز أهداف البرنامج الوطني الريادي لبحوث السرطان، أُجريت هذه الدراسة للوقوف على معارف وممارسات الإناث حول الفحص الذاتي للثدي. وقد بينت تلك الدراسة بأن الغالبية العظمى من تلك الشريحة من المثقفات في المجتمع العراقي (93.9٪) قد سَمِعْنَ بالفحص الذاتي للثدي، ولم يكن هناك اختلاف ملحوظ في مستوى الإجابة بين المجموعات الثلاث. وسجّل باحثون من الدول المجاورة نتائج مختلفة في دراسات مماثلة تناولت معارف النساء حول تلك الممارسات، فبينما أظهرت إحدى الدراسات أن (67٪) من النساء الأردنيات قد سمعن بالفحص الذاتي للثدي [9] تؤكد نتائج دراسة أخرى أن مستوى المعرفة عالٍ نسبياً عند الممرضات في المملكة الأردنية [10]. أما في المملكة العربية السعودية فقد أشارت الحصيلة النهائية لمسح مماثل أجري على عينة من طالبات المرحلة الثانوية في إحدى المدارس إلى أن إجابة (40٪) منهن تدل على معرفتهن بطريقة الفحص الذاتي للثدي وأهميتها في الكشف المبكر عن الأمراض[11] .

وعلى الرغم من أنه لا توجد بيّنات ثابتة على أثر الفحص الذاتي للثدي [12]، غير أنّ هناك دراسات تدلُّ على أن المعرفة بهذه الممارسة وانتهاجها، وإن لم تؤدِّ بمفردها إلى انخفاض في نسبة الوفيات من سرطان الثدي، فإنها تسهم في إذكاء وعي النساء بهذا المرض، وتمنحهن مسؤولية الاعتناء بصحتهن، وتشجعهن على طلب المشورة الطبية إذا ما لاحظن وجود أية أعراض أو علامات غير طبيعية [1,7,8,12–14]. إذ استطاعت نتائج الباحثين في دراسة أترابية cohort أجريت في فنلندا [13] وفي دراسة الحالات والشواهد من كندا [14] أن تبين أن الفحص الذاتي للثدي له مزايا عديدة مثمرة في جميع الأعمار، وإن لم تتمكن من استثناء وجود انحياز الانتقاء. كما أشادت جمعية السرطان الأمريكية بالدور الإيجابي للفحص الذاتي للثدي في الكشف المبكر عن السرطان، ونصحت النساء بممارسته شهريا، وبانتظام، للتعرف على طبيعة وملمس الثدي، لكي يتسنى لهن معرفة أي تغيرات قد تطرأ فيما بعد و حال حدوثها [15].

كان المصدر الرئيسي للمعرفة عند النساء في هذه الدراسة هو التلفاز (39.9٪) ويليه الطبيب، ومن ثم البرنامج الوطني الريادي



الشكل 3 الأسباب الرئيسية وراء عدم القيام بالفحص الذاتي للثدي عند أفراد العينة.

الجدول 4 هل تقومين بزيارة الطبيب عند شعورك بألم أو ورم في ثديك؟إذا كانت الإجابة بـ"لا" فما هو السبب؟

ت	المهنة	نعم		لا		المجموع		الاحتمالية
		العدد	%	العدد	%	العدد	%	
1	المدرِّسات	66	80.5	16	19.5	82	12.2	26.600
2	الموظفات	93	72.6	35	27.3	128	18.9	$P < 0.05$ يُعتدّ بها إحصائياً
3	الطالبات	257	55.4	207	44.6	464	68.8	
	المجموع[a]	416	61.7	258	38.3	674	100	

[a] أُهملت 184 استمارة لعدم مطابقتها لشروط ملء الاستبيان.

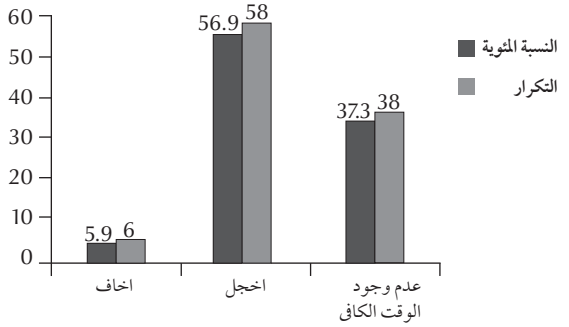
الجدول 5 إذا تعلمت الطريقة الصحيحة للفحص الذاتي للثدي فهل ستكونين على استعداد لتعليم قريباتك وزميلاتك؟ إذا كانت الإجابة بـ "لا" فما السبب؟

ت	المهنة	نعم		لا		المجموع		الاحتمالية
		العدد	%	العدد	%	العدد	%	
1	المدرِّسات	69	93.2	5	6.7	74	9.8	3.770
2	الموظفات	119	90.8	12	9.1	131	17.3	$P > 0.05$ لا يُعتدّ بها إحصائياً
3	الطالبات	478	86.7	73	13.2	551	72.9	
	المجموع[a]	666	88.1	90	11.9	756	100	

[a] أُهملت 102 استمارة لعدم مطابقتها لشروط ملء الاستبيان.

لبحوث السرطان، والذي بدأت فعالياته تظهر للعيان أثناء السنوات الماضية من خلال ندوات التوعية الجماهيرية، بينما أظهرت وسائل الإعلام المطبوعة (الصحف والمجلات) كطريقة لإيصال الرسائل الصحية للنساء دوراً ضئيلاً نسبياً (11.5٪) ومقاربة للنسبة التي شكلتها مواد التوعية التي يصدرها البرنامج من جداريات ومطويات (10٪) والتي أخذت تتوافر خلال الفترة الأخيرة في ربوع الجامعات العراقية، مع تفعيل أنشطة الحملة الوطنية للكشف المبكر عن سرطان الثدي. وفي الأردن سَجَّلَتْ نتائج دراسة سابقة أن (82٪) من النساء اطَّلَعْنَ على طريقة الفحص الذاتي للثدي عن طريق التلفاز والمذياع [9] مما يؤكد أهمية دور الوسائل المرئية والصوتية كقناة إعلامية في ترويج ونشر التوعية في المجتمع العربي. وفي الوقت الذي تتوافق فيه نتائج هذه الدراسة العراقية مع دراسات أخرى مماثلة من دول الجوار [16]، فقد سجل باحثون من المملكة العربية السعودية أن المصدر الأول للمعرفة حول جدوى الفحص الذاتي للثدي عند الغالبية العظمى من المشاركات (83.2٪) كان وسائل الإعلام المطبوعة التي سبقت دور التلفاز [17]. بينما شدَّد باحثون آخرون على ضرورة تكثيف برامج التعليم المهني والتثقيف الصحي للعاملين في الحقل الطبي لأنهم على الخط الأمامي للتماس بين المصابين بالسرطان وبين نظام الرعاية الصحية [6, 9, 16]. ومما يدعو للأسف أن دور المراكز الصحية في عملية التوعية كان محدوداً جداً، في هذه الدراسة وفي غيرها من الدراسات المدونة في المنطقة العربية [9, 11] مما يستوجب العمل على تعزيز عملية التدريب المهني للعاملين في تلك المراكز باعتبارها البوَّابة الأولى التي يتم عن طريقها نظام الإحالة في البرامج الوطنية لمكافحة السرطان.

وعلى الرغم من أن معظم المشارِكات في هذه الدراسة قد سمعن بالفحص الذاتي للثدي إلا أنه تبين بأن نصف العينة تقريباً (46.1٪) لا يمارسن هذا الفحص، وكان أغلبهن من الطالبات (49٪). ومع ذلك تُعتَبر تلك النسبة أعلى نسبياً مما أظهرته دراسات مماثلة من دول إقليم شرق المتوسط، إذ كشفت نتائج مسح صحي شمل 300 امراة سعودية من منطقة القصيم بأن حوالي 20٪ منهن يمارسن الفحص الذاتي للثدي، ولكن بصورة غير منتظمة [18] في حين أوضحت دراسات أخرى من دولة الإمارات العربية المتحدة [19] وجمهورية إيران الإسلامية [20] أن 13٪ تقريباً يمارسن الفحص الذاتي شهرياً بانتظام. كما سَجَّل مسحٌ صحي شمل ثلاث مدن في المملكة الأردنية أن 17.7٪ من السيدات يفحصْنَ الثدي ذاتياً وبانتظام كل شهر[21]. وفي حين أظهرت دراسات أجريت على عينة من نساء آسيويات يَقْطُنَّ في المملكة المتحدة والصين نتائج مماثلة نسبياً [22, 23] ، فقد كشفت نتائج مسح على سيدات يقمن في الولايات المتحدة الأمريكية أن 40٪ يمارسن الفحص الذاتي للثدي شهرياً [24]. وتظل تلك النسب أقل بكثير مما تسجله الدراسات الموثقة في بلدان العالم المتطورة، والتي تشير إلى وجود ارتباط وثيق بين ممارسة الفحص الذاتي للثدي وبين المستوى الرفيع للتعليم الطبي والخدمات الصحية التي يتمتع بها المواطنون في تلك الدول [25] .



الشكل 4 الأسباب الرئيسية وراء الامتناع عن زيارة الطبيب عند أفراد العينة.

وعند محاولة الوقوف على الأسباب الحقيقية وراء عدم ممارسة الفحص الذاتي للثدي في هذه الدراسة، وُجد أن (42.2٪) ممن لا يقمن بالفحص لا يعرفن الطريقة الصحيحة، وأن (39.5٪) منهن ليس لديهن الثقة بإجادة الفحص، بينما عُزيَ السبب في 16.4٪ منهن إلى الشعور بالخوف من اكتشاف أيِّ عقدة أو مرض في الثدي، وبهذا تكون هذه النتائج مشابهة لما سجلته بعض الدراسات العربية الأخرى التي أجريت في إقليم شرق المتوسط وكشفت أن تردد النساء وامتناعهن عن ممارسة الفحص الذاتي للثدي يعود إلى الشعور بالقلق من اكتشاف مرض السرطان وقلة المعرفة حول خطورة مرض السرطان [26, 27]. وبيَّن اختبار مربع كاى من خلال تلك الدراسة وجود علاقة إحصائية هامة بين المهنة وبين الممارسة عند النساء اللاتي يقمن بالفحص الذاتي للثدي، حيث كان أغلبهن من المدرِّسات (69.1٪). كما أشار الاختبار ذاته إلى وجود علاقة إحصائية يُعْتَدُّ بها بين المهنة وبين القيام بزيارة الطبيب، حيث كشفت النتائج أن (61.7٪) من المشاركات في البحث يَقُمْنَ بزيارة الطبيب عند الشعور بوجود أي أعراض أو علامات لمرض في الثدي ومعظمهن من المدرِّسات أيضاً (80.5٪)، منهنَّ اللاتي أظهرن إدراكهن بجدوى الفحص الذاتي والفحص السريري للثدي وبأهمية الكشف المبكر عن سرطان الثدي كأساس لتفادي المرض.

وفي الوقت ذاته بينت هذه الدراسة أن نصف الطالبات المشاركات (49٪) لا يمارسن الفحص الذاتي للثدي، و(72.9٪) منهن لا يقمن بزيارة الطبيب (38.3٪) حتى وإن كانت هناك ضرورة لذلك. كما اتَّضح أن السبب الرئيسي وراء الامتناع عن مراجعة الطبيب يعود إلى الخجل (56.9٪) أو عدم وجود الوقت الكافي (37.3٪) أو الخوف من تشخيص المرض (5.8٪)؛ وهذا مشابه لما أوردته إحدى الدراسات السعودية التي ذكرت أن نسبة الطالبات المراجِعات للطبيب عند الشك في وجود آفة في الثدي ضئيلة جداً لا تتجاوز (2.5٪). كما أكدت دراسات عربية أخرى [26, 27] أن سبب رفض النساء لزيارة الطبيب يُعْزَى أساساً إلى شعورهن بالحرج. وذلك يعود إلى الطبيعة الخجولة المميزة للمرأة العربية والتي من الممكن تلافيها من خلال السعي إلى تنمية الوعي والمعرفة، وبالأخص عند الطالبات، حول العلامات المنذرة بالسرطان، وتثقيف عموم النساء حول التغيرات التي ينبغي ترقُّبها وأهمية المراجعة الفورية للطبيب. إذ إن غَرْسَ التوعية حول سرطان الثدي وأهمية تشخيصه بين النساء في أعمار صغيرة، يمهِّد للالتزام بممارسة طرق الكشف المبكر عنه في أعمار متقدمة [28] .

ومن المثير للاهتمام أن (88.1٪) من المشاركات المشمولات في هذا المسح أظهرن استعداداً لتعليم قريباتهن وزميلاتهن الطريقة

الصحيحة للفحص الذاتي للثدي إذا ما تم إرشادهن إلى ذلك. كما أعلن (40.4٪) منهن عن رغبة صادقة للانضمام إلى البرنامج الوطني الريادي لبحوث السرطان. إن تلك المؤشرات الإيجابية تدعو إلى ضرورة الارتقاء بمستوى البرامج الوطنية لمكافحة السرطان ودعم ترويج التوعية الجماهيرية للوصول إلى كافة شرائح المجتمع العراقي. ثم إن الالتزام بوضع استراتيجية توعية شاملة وهادفة للنساء يتطلب إدراكاً ووعياً تاماً لكل ما يتعلق بالمرض من مسببات وعوامل اختطاره والطرق المفضلة للتشخيص والعلاج. ولذا فإن تضافر الجهات الحكومية المعنية والوزارات ذات العلاقة، وتشجيع التعاون مع منظمات المجتمع المدني ووسائل الإعلام في تنفيذ الغايات المنشودة، وتسمية أعضاء ارتباط لبرنامج الحملة الوطنية للكشف المبكر عن سرطان الثدي، كلُّها تمثِّل شروطاً ضرورية للمساهمة الفاعلة في عملية التثقيف والتدريب المهني الذي يستهدف تعزيز المعرفة وتطوير المهارات عند النساء. كما أن التأكيد على إدراج مادة التوعية الوطنية حول الكشف المبكر عن سرطان الثدي في مناهج المدارس للدراسة الإعدادية، من شأنه أن يغرس المعرفة بين الفتيات في أعمار صغيرة مما يمهد لالتزام المرأة العراقية بالممارسات الصحية الجيدة فيما بعد.

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Validity and reliability of haemoglobin colour scale and its comparison with clinical signs in diagnosing anaemia in pregnancy in Ahmedabad, India

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مُعَوَّلية وصحة سلم القياس اللوني للهيموغلوبين ومقارنته بالعلامات السريرية في تشخيص فقر الدم لدى الحوامل في أحمد آباد، الهند

د. ف بالا، شيتال فياض، أباراجيتا شوكلا، هيمانت تيواري، غنيا بات، كناري غوبتا

الخلاصة: تقارن هذه الدراسة مدى صحة سلم القياس اللوني للهيموغلوبين، والعلامات السريرية لتشخيص فقر الدم، مقابل طريقة ساهلي لقياس الهيموغلوبين باعتباره المعيار الذهبي، مع تقييم معولية سلم القياس اللوني للهيموغلوبين. وقد شملت العينة 129 حاملاً من ستة مراكز صحية حضرية في أحمد آباد. واتضح أن معدل انتشار فقر الدم لديهن وفق طريقة ساهلي 69.8٪ ووفق سلم القياس اللوني للهيموغلوبين 78.3٪، ووفق العلامات السريرية 89.9٪ ولم يكن هناك اختلاف يُعْتَدُّ به إحصائياً بين طريقة ساهلي وبين سلم القياس اللوني للهيموغلوبين، وفي حين كان هناك اختلاف يُعْتَد به إحصائياً بين طريقة ساهلي وبين العلامات السريرية. وقد كان هناك اختلاف يُعْتَد به بين وسطي مستوى الهيموغلوبين في طريقة ساهلي وطريقة سلم القياس اللوني للهيموغلوبين. وكانت الحساسية لسلم القياس اللوني للهيموغلوبين 83٪، والنوعية 33.3٪، والقيمة التنبؤية الإيجابية 74.3٪، والقيمة التنبؤية السلبية 46.4٪، أما بالنسبة للعلامات السريرية فكانت الحساسية 91.1٪، والنوعية 12.8٪، والقيمة التنبؤية الإيجابية 70.7٪، والقيمة التنبؤية السلبية 38.5٪. وكان الاتفاق بين الملاحظين في سلم القياس اللوني للهيموغلوبين متوسطاً (K = 0.43). وكانت العلامات السريرية أفضل من سلم القياس اللوني للهيموغلوبين في تشخيص فقر الدم. ويمكن استخدام سلم القياس اللوني للهيموغلوبين ميدانياً إذا ما تم تدريب القائمين على التقييم تدريباً كافياً.

ABSTRACT This study compared the validity of the haemoglobin colour scale (HCS) and clinical signs in diagnosing anaemia against Sahli's haemoglobinometer method as the gold standard, and assessed the reliability of HCS. The sample comprised 129 pregnant women recruited from 6 urban health centres in Ahmedabad. The prevalence of anaemia was 69.8% by Sahli's method, 78.3% by HCS and 89.9% by clinical signs; there was no statistically significant difference between Sahli's method and HCS whereas there was between Sahli's method and clinical signs. The mean haemoglobin level by Sahli's method and HCS differed significantly. The sensitivity, specificity, positive predictive value and negative predictive value of HCS was 83.3%, 33.3%, 74.3% and 46.4% respectively and that of clinical signs was 91.1%, 12.8%, 70.7% and 38.5% respectively. Interobserver agreement for HCS was moderate (κ = 0.43). Clinical signs are better than HCS for diagnosing anaemia. HCS can be used in the field provided assessors are adequately trained.

Validité et fiabilité de l'échelle colorimétrique de détermination du taux d'hémoglobine et comparaison avec les signes cliniques pour le diagnostic d'anémie pendant la grossesse à Ahmedabad (Inde)

RESUME La présente étude a comparé la validité de l'échelle colorimétrique de détermination du taux d'hémoglobine et les signes cliniques pour le diagnostic de l'anémie par rapport à la méthode d'hémoglobinométrie de Sahli en tant que méthode de référence, puis a évalué la fiabilité de l'échelle. L'échantillon comptait 129 femmes enceintes recrutées dans six centres de soins de santé de ville, à Ahmedabad. La prévalence de l'anémie était de 69,8 % avec la méthode de Sahli, de 78,3 % avec l'échelle colorimétrique de détermination du taux d'hémoglobine et de 89,9 % avec les signes cliniques ; aucune différence statistiquement significative n'a été observée entre la méthode de Sahli et l'échelle colorimétrique alors qu'il en existait entre la méthode de Sahli et les signes cliniques. Le taux moyen d'hémoglobine mesuré avec la méthode de Sahli et avec l'échelle colorimétrique était très différent. La sensibilité, la spécificité et les valeurs prédictives positive et négative de l'échelle colorimétrique de détermination du taux d'hémoglobine étaient de 83,3 %, 33,3 %, 74,3 % et 46,4 % respectivement et de 91,1 %, 12,8 %, 70,7 % et 38,5 % respectivement pour les signes cliniques. L'accord interobservateur pour l'échelle colorimétrique de détermination du taux d'hémoglobine était modéré (κ = 0,43). Les signes cliniques sont plus efficaces que l'échelle colorimétrique pour le diagnostic de l'anémie. L'échelle peut être utilisée sur le terrain à condition que les évaluateurs soient correctement formés.

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Introduction

Anaemia is a major public health problem globally. It affects about 1.62 billion people, which corresponds to 24.8% of the global population [1]. Women of reproductive age, particularly during pregnancy and children, especially young ones, are more vulnerable to anaemia due to their unique physiological characteristics [2,3]. Anaemia is a public health problem for pregnant women in all of the World Health Organization's (WHO) Member States [1]. In India, the prevalence of anaemia in pregnant women is 57.9% according to the National Family Health Survey 3 (NFHS 3) [4].

Given the consequences of anaemia during pregnancy, easy and accurate diagnosis is important. Haemoglobin (Hb) estimation is one simple and economic laboratory parameter to assess anaemia and is thus used quite frequently in population studies [2]. Another method used where no laboratories or few health resources are available is physical examination, which aims to identify skin or mucous membrane pallor on, for example, the conjunctiva, palms, nail beds, lips and tongue as clinical signs of anaemia [2,3]. Several methods are available for estimation of Hb in the field setting, such as the copper sulphate specific gravity method, the Lovibond comparator and portable Hb meters [5]. Currently Sahli's haemoglobinometer method for Hb estimation is the one recommended by the Government of India for use by the health workers in the field and in laboratory facilities [6].

WHO developed the haemoglobin colour scale (HCS) to screen for anaemia in the absence of laboratory-based haemoglobinometry [7]. It is a simple and inexpensive device for providing a reliable indicator of the presence and severity of anaemia [8]. Various studies have been conducted globally to validate the HCS and its sensitivity for detecting anaemia ranged from 75% to 97% while specificity ranged from 41% to 98%. However, the studies had heterogeneous populations, health care settings, anaemia prevalence and findings so controversy about the usefulness of HCS still persists [9]. In this regard, it is necessary to assess diagnostic accuracy in local health care settings with local workers.

In Ahmedabad, as of June 2009, a commercial kit of HCS was provided to all the urban health centres (UHCs) to be used in the field. No validity assessment has been done so far since its introduction. Therefore, the present study was carried out to: compare the validity of HCS and that of clinical assessment against Sahli's haemoglobinometer method in diagnosing anaemia; assess the reliability of HCS; and make area-specific recommendations in this regard.

Methods

Study setting and sample

The present study was conducted in Ahmedabad, a major city of Gujarat state in western India. The city is divided into 6 municipal zones and 57 election wards. We conducted a cross-sectional study in randomly selected UHCs (1 per each zone of the city) during November 2009–January 2010. A list of zone-wise UHCs was obtained from the corporation office and lottery method was used to select one UHC from each zone. The study population was pregnant women attending UHCs for the first time; those already on iron therapy were excluded.

The sample size was calculated assuming a prevalence of anaemia of 58% as per NFHS 3 [4] and allowable error of 15%. Women were recruited into the study as they came to the centres for an antenatal care check-up, after assessing if they met the inclusion and exclusion criteria, until the desired sample size was met from each centre (21 from 3 centres and 22 from the other 3 centres as decided by lottery method from 6 UHCs). There was no refusals to participate as Hb estimation is routinely done during antenatal care visits and they were informed about the study and the method. Thus a total 129 pregnant women were recruited after taking written informed consent in the vernacular language for personal interview and Hb estimation.

Data collection

General information was collected by the investigators by interview of each woman using a predesigned pretested questionnaire. Information was also obtained on the number of conceptions, parity, number of live children at the time of the interview and length of time between the present and previous conception.

Anaemia assessment

Assessment of anaemia by clinical signs was carried out by the medical officer of the respective UHC by identifying skin or mucous membrane pallor on conjunctiva, tongue and palms. Sahli's haemoglobinometer was also used to determine Hb level and was carried out by a trained laboratory technician in the respective UHC. For HCS, the commercial kit (Kruise Path, Ahmedabad) provided to all UHCs by Ahmedabad Municipal Corporation was used. The reading for HCS is taken by comparing blood drops on filter paper with colour standards. It was taken separately by 2 persons, a trained multi-purpose health worker (MPHW) or health visitor (HV) who routinely uses the HCS in the field and one of the investigators (KG).

The data so generated were used for the assessment of inter-observer variation. However, reading of the test as interpreted by MPHW/HV was used for the purpose of calculation of validity because they routinely interpret the results of HCS in the field. Blinding was carried out so that none of these individuals knew the findings of the

others; 4 different sheets were made for recording of results by the medical officer, laboratory technician, MPHW/HV and the investigator (KG). At the end of each session, these sheets were collected by another investigator for data entry. The investigator who interpreted the finding of HCS was not involved in data entry. As per WHO, Hb threshold for diagnosing anaemia in pregnant women is 11 g/dL [2]. Taking this cut-off, the following classification was used:

- Hb ≥ 11.0 g/dL: no anaemia
- Hb 9.0 to 11.0 g/dL: mild anaemia
- Hb 7.0 to 9.0 g/dL: moderate anaemia
- Hb < 7 g/dL: severe anaemia.

Ethical considerations

Ethical clearance for the study was obtained from the Institutional Ethics Committee for Research in Human Subjects of the Smt. NHL Municipal Medical College, Ahmedabad. The women who were diagnosed as having anaemia were given iron folic acid treatment as per state guidelines.

Data analysis

Data were entered in a master chart to determine the following validity indicators:

- Sensitivity of the individual tests: defined as the ability of the test to identify correctly those who have the disease [10].
- Specificity of the individual tests: defined as the ability of the test to identify correctly those who do not have the disease [10].
- Predictive values of the individual tests [10]:
- Positive predictive value (PPV): probability of having disease in a patient with a positive test.
- Negative predictive value (NPV): probability of not having disease in a patient with a negative test.

Reliability of HCS was assessed by calculating the inter-observer variations in readings of HCS using Kappa statistics [10]. To study correlation between the Sahli and HCS methods, a Bland Altman plot was used [11].

Data analysis was done using Microsoft Excel, MedCalc, version 11.1.1.0 and *SPSS*, version 17.0.

Results

The mean age of the pregnant women was 24.2 [standard deviation (SD) 3.7] years and mean months of amenorrhoea was 4.71 (SD 2.1) at the time of registration.

Of the 129 women included in the study, 69.8% were diagnosed with anaemia by Sahli's method, 78.3% by HCS and 89.9% by clinical signs. There was no significant difference between the proportions diagnosed with anaemia by Sahli's method and HCS ($P = 0.16$) whereas there was a significant difference between the proportions diagnosed by Sahli's method and by clinical signs ($P = 0.0001$). With regard to the categories of anaemia, no significant difference was found between Sahli's method and HCS (all $P > 0.05$). However, there was significant difference found in the proportion with moderate anaemia by Sahli's method and by clinical signs ($P = 0.02$) (Table 1).

The mean Hb levels of the pregnant women by Sahli's method was 9.97 (SD 1.35) g/dL and by HCS was 9.51 (SD 1.61) g/dL, a significant difference ($P = 0.0031$, Mann–Whitney test). The Bland Altman plot (Figure 1) showed a mean difference of 0.5 g/dL between the 2 methods with limits of agreement of –2.7 g/dL to 3.6 g/dL; this can be considered significant clinically because the treatment changes with change of category of anaemia, which has interval of 2 g/dL. As the mean Hb increased the difference between the 2 methods became smaller. For lower average Hb values, the HCS reading showed lower values compared to the Sahli reading, while for higher mean Hb values, the HCS showed higher reading. The correlation coefficient was 0.4077 (95% confidence interval: 0.2526–0.5423) ($P < 0.0001$)

The validity indicators showed that the sensitivity to differentiate anaemia from nonanaemia was higher for clinical signs (91.1%) than for HCS (83.3%), while specificity, PPV and NPV were higher for HCS (Table 2). In addition, the sensitivity of clinical signs to diagnose mild and moderate anaemia was higher than HCS while for severe anaemia both methods had 100% sensitivity (Table 3). Weighted kappa value for HCS was 0.43, indicating moderate inter-observer agreement.

In 14.7% of cases, there was no difference in Hb readings between HCS and Sahli's method, while 55.8% of

Table 1 Prevalence and severity of anaemia by all 3 methods among the study population ($n = 129$)

Severity	Sahli's method	HCS	Clinical signs	*P*-value	
	%	%	%	Sahli vs HCS	Sahli vs clinical signs
Mild anaemia	55.0	53.4	61.2	0.89	0.38
Moderate anaemia	13.2	21.7	24.8	0.10	0.02
Severe anaemia	1.6	3.2	3.9	0.66	0.45
Anaemia of any grade	69.8	78.3	89.9	0.16	0.0001

HCS = haemoglobin colour scale.

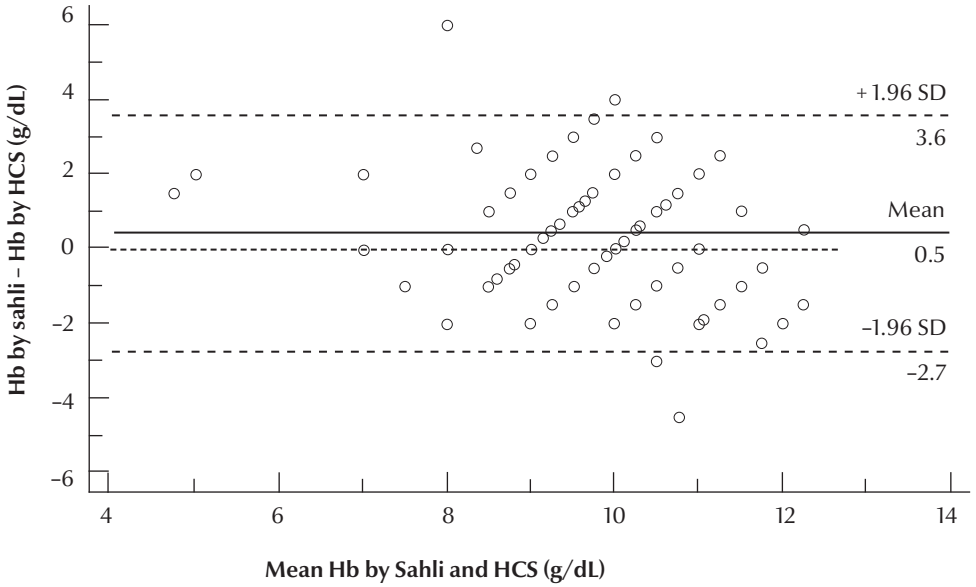

Figure 1 Bland Altman plot for haemoglobin colour scale compared with Sahli's method (SD = standard deviation)

cases, the difference was ±1 g/dL, and in 82.9%, the difference was within ±2 g/dL; in 17.1%, the difference was >2 g/dL.

Discussion

In the present study, the prevalence of anaemia in pregnant women was 69.8% which is higher than the national average according to NFHS 3 (58%) [4]. Various factors, such as physiological changes during pregnancy, lower socioeconomic and educational status of the women, may account for this difference. For each category of anaemia the proportion was highest by clinical assessment, which may be on account of the clinician's subjective preference or tendency chance missing any anaemic woman.

Quantitative analysis of paired observation showed that the reading of HCS was 0.46 ± 1.63 g/dL lower than Sahli's method which was statistically significant. A similar result was found in the Islamic Republic of Iran in a study of blood donors, with difference of 0.32 ± 0.65 g/dL compared with an automated cell counter [12].

The sensitivity of clinical signs in diagnosing mild and moderate anaemia was higher than that of HCS. For severe anaemia the sensitivity of both the methods was 100%; this may be because only a few of the women were diagnosed with severe anaemia by the standard method. Other studies have reported different findings; they found that HCS was better than clinical signs for diagnosing anaemia[8,13,14].

In the present study the sensitivity of HCS was 83.3% and specificity 33.3%. Other studies also reported HCS with sensitivities above 80% [14–16]. However, Anand et al. found a sensitivity of 30% and specificity of 100% for HCS when compared with an autoanalyser [6]. This is the only study that we found showing such a low sensitivity. The exact reason is not clear but there were differences in the methodology which might have contributed to such differences in results, e.g. the gold standard method used in their study was an autoanalyser, the HCS kit used was from a different manufacturer and the study population taken was not vulnerable to anaemia.

Given the high prevalence of anaemia in pregnancy, the ideal instrument for diagnosis would be one with a high sensitivity and low false negative results

Table 2 Validity indicators of haemoglobin colour scale and clinical signs against Sahli's method to diagnose anaemia

Validity indicator	Haemoglobin colour scale	Clinical signs	Simultaneous testing of both
Sensitivity (95% CI) [%]	83.33 (74.0–90.36)	91.11 (83.23–96.08)	96.67 (90.58–99.31)
Specificity (95% CI) [%]	33.33 (19.09–50.22)	12.82 (4.30–27.43)	10.26 (2.86–24.23)
PPV (95% CI) [%]	74.26 (64.60–82.44)	70.69 (61.52–78.77)	71.31 (62.39–79.17)
NPV (95% CI) [%]	46.43 (27.51–66.13)	38.46 (13.86–68.42)	57.14 (18.14–90.11)
Accuracy [%]	68.2	67.4	70.54

CI = confidence interval; PPV = positive predictive value; NPV = negative predictive value.

Table 3 Sensitivity of haemoglobin colour scale and clinical signs against Sahli's method for categories of anaemia

Category of anaemia	Sensitivity (95% CI) [%]	
	Haemoglobin colour scale	Clinical signs
Mild	59.15 (46.83–70.72)	69.01 (56.91–79.43)
Moderate	41.18 (18.43–67.04)	47.06 (22.96–72.20)
Severe	100.00 (15.81–100.00)	100.00 (15.81–100.00)

CI = confidence interval.

as an increase in false negatives would exclude some anaemic women from anaemia combat programmes in place in India, which would be harmful in places with high anaemia prevalence rates.

One of the advantages in using the HCS is that training of examiners is easy, fast and economic, and requires minimal material to distinguish between the different colour variations of the scale [7]. However, it is important to follow the instructions on how to hold the instrument and use the correct thickness of blood drop, adequate environmental luminosity and the established reading time [7,8,17] and this should be emphasized in training. Similarly, training can also be given for clinical signs to the health workers as its sensitivity for identifying each category of anaemia is higher.

Comparison with other studies is difficult as the gold standard method used and the study population differ in different studies. Taking into consideration financial and other resources, Sahli's method is widely used at health centres in our study area. So Sahli was taken as the gold standard in the present study although it is not considered the gold standard for Hb estimation. Although laboratory technicians were previously trained for Sahli's method and MPHW/HV were trained for HCS, there might be minor differences due to subjective preferences.

As per the present study, assessment by clinical signs is a better method for diagnosing anaemia as compared to HCS. The scope of HCS seems to be limited because of its need for precise application and proper, more stringent training for the health workers is needed with further comparison with the standard method. Accuracy in both methods may be improved as examiners acquire more experience, enabling them to reduce classification errors. It is recommended that the MPHW/HV diagnose anaemia by looking for clinical signs and should start treatment on that basis; the patient can then be referred to the laboratory for confirmation and follow up. HCS can be used in cases where there is no possibility of the patient getting to a laboratory for follow up and in uncertain cases to support clinical examination.

Because detection of anaemia is important in order to prevent its adverse consequences, further studies are required to determine the effect of the various screening methods on longer term clinical outcomes, i.e. less anaemia at time of delivery among pregnant women, increased birth weight of babies, reduced maternal mortality, along with consideration of cost, rather than focussing only on diagnostic accuracy. Such studies will help health planners in choosing the cost-effective screening method for anaemia.

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Les môles hydatiformes partielles au Maroc : étude épidémiologique et clinique

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الكيسة العدارية الجزئية في المغرب: دراسة وبائية وسريرية

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الخلاصة: استعرض الباحثون في هذه الدراسة الاستعادية حالات الكيسة العدارية الجزئية التي شخصت في المستشفى الجامعي في ا لدار البيضاء في الفترة 2000-2010 بُغْيَة دراسة العوامل الوبائية والسريرية والعلاجية والباثولوجية التفاقمية المرتبطة بالكيسة العدارية الجزئية. وكانت جميع الحالات مثبتة سريرياً وبالفحص بأمواج فوق الصوت وبالفحص الباثولوجي. وتعرف الباحثون على 24 حالة من الكيسات العدارية الجزئية من بين 60748 ولادة و1704 إسقاط مما يجعل تواترها 0.4 بكل ألف حمل و1.4٪ بكل إسقاط. وقد كان العمر الوسطي 26 عاماً (المجال: 16-55 عاماً). وكانت ظروف اكتشاف الحالات وإجراء الفحص بالأمواج فوق الصوت مختلفة، فقد التمس 79.2٪ من المريضات المشورة بسبب النـزف، ولوحظت المتلازمة السريرية للانسمام الدرقي لدى مريضة واحدة (4.2٪). أما الفحص الجسدي فأظهر زيادة في حجم الرحم لدى 83.3٪ من الحالات، متـرافقة بكتلة رحمية جانبية في 25٪ من الحالات. وقد تم دعم التشخيص بالفحص بالأمواج فوق الصوتية مشفوعاً بقياس مستوى موجِّهة الغدد التناسلية المشيمائية البشرية بيتا BHCG. وتم التأكُّد الهستولوجي في جميع الحالات، وكانت المعالجة بالرشف من باطن الرحم. وقد لوحظ انزياح ورمي في حالة واحدة (4.2٪) وتراجَعَ بالمعالجة الكيميائية.

RÉSUMÉ La présente étude rétrospective a examiné les cas de môle hydatiforme partielle (MHP) diagnostiqués au CHU de Casablanca de 2000 à 2010 et rapporte le profil épidémiologique, clinique, thérapeutique et évolutif de cette entité pathologique. Ont été inclus tous les cas de MHP évoqués échographiquement et cliniquement puis confirmés à l'examen anatomo-pathologique. Nous avons recensé 24 cas de MHP parmi 60 748 accouchements et 1704 avortements spontanés, ce qui donne une fréquence de 0,4 pour 1000 grossesses et 1,4 % des avortements. La moyenne d'âge était de 26 ans (extrêmes 16-55 ans). Les circonstances de découverte clinique et échographique étaient variées : 79,2 % des patientes consultaient pour des métrorragies ; un syndrome thyrotoxicosique clinique était retrouvé chez une patiente (4,2 %). L'examen physique montrait un utérus augmenté de taille dans 83,3 % des cas associé à une masse latéro-utérine dans 25 % des cas. Le diagnostic était étayé par un examen échographique associé à un dosage de β-HCG plasmatique. La confirmation était histologique dans tous les cas et le traitement était une aspiration endo-utérine. La dérive néoplasique a été observée dans un cas (4,2 %) qui a évolué vers la rémission sous chimiothérapie.

Partial hydatidiform mole in Morocco: an epidemiological and clinical study

ABSTRACT This retrospective study reviewed cases of partial hydatidiform mole (PHM) diagnosed at the University Hospital in Casablanca from 2000 to 2010 in order to examine the epidemiological, clinical, therapeutic and progressive pathological factors associated with PHM. All PHM cases confirmed clinically and sonographically at pathological examination were included. We identified 24 cases of PHM among 60 748 births and 1704 abortions, giving a frequency of 0.4 per 1000 pregnancies and 1.4% of abortions. The mean age was 26 years (range: 16–55 years). The circumstances of discovery and clinical ultrasound varied: 79.2% of patients sought consultation for bleeding; clinical thyrotoxicosis syndrome was found in 1 patient (4.2%). Physical examination showed increased uterine size in 83.3% of cases associated with a latero-uterine mass in 25%. The diagnosis was supported by an ultrasound examination combined with measurement of plasma βHCG. Histological confirmation was made in all cases and treatment was endo-uterine aspiration. Neoplastic drift was observed in 1 case (4.2%) which went into remission with chemotherapy.

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Introduction

La maladie trophoblastique gestationnelle (MTG) correspond à une transformation kystique des villosités choriales associée à une prolifération du trophoblaste avec sécrétion excessive de l'hormone choriogonadotrophine [1]. Les môles hydatiformes complètes (MHC) et partielles (MHP) sont des entités bénignes. Elles peuvent évoluer, avec des probabilités différentes, vers des entités cliniquement malignes appelées tumeurs trophoblastiques gestationnelles (TTG) [1,2].

La MHP est généralement une triploïdie diandrique. Elle dérive de la fécondation d'un ovule normal par deux spermatozoïdes (dispermie) ou un spermatozoïde dupliqué, demeuré diploïde [3]. Elle est caractérisée par une hyperplasie focalisée et discrète du trophoblaste, une dégénérescence localisée des villosités choriales, une structure fœtale ou un tissu embryonnaire identifiable [1,4].

Les MHP et MHC présentent des caractéristiques histopathologiques et cytogénétiques ainsi qu'une évolution très distinctes. L'étude de la MHP et de la MHC séparément montre une différence importante en ce qui concerne l'association de facteurs, notamment l'âge maternel, la parité, le groupe sanguin, le rôle des facteurs exogènes, cette association étant plus fréquente dans l'une que dans l'autre [1,2].

Nous rapportons une série de môles hydatiformes partielles, à travers laquelle nous allons présenter nos résultats épidémiologiques, cliniques, thérapeutiques et évolutifs et distinguer les particularités de cette entité.

Méthodes

Cette étude rétrospective des MHP marocaines porte sur une période de 11 années, qui s'étale de janvier 2000 à décembre 2010. Elle a été réalisée sur la base de l'activité du service de gynécologie-obstétrique « C » du Centre Hospitalier Universitaire Ibn Rochd de Casablanca au Maroc, où 24 cas de MHP ont ainsi pu être colligés.

Les critères d'inclusion étaient les suivants : toutes les MHP évoquées échographiquement et cliniquement puis confirmées à l'examen anatomo-pathologique. Nous avons étudié en particulier les données épidémiologiques, cliniques, thérapeutiques et évolutives des MHP. Le test du χ^2 a été utilisé pour les comparaisons statistiques de certains résultats.

Résultats

Épidémiologie

Durant la période d'étude, 60 748 femmes ont été admises pour accouchement et 1704 pour avortement spontané. Pendant cette même période, nous avons recensé 24 cas de môle hydatiforme partielle (MHP) et 267 cas de môle hydatiforme complète (MHC). Les MHP représentent ainsi 0,04 % des accouchements normaux, soit 1/2500.

La moyenne d'âge des patientes est de 26 ans. Une part numériquement importante des patientes admises pour une grossesse molaire partielle appartient aux tranches d'âge des 20-29 ans (50,0 %) et 30-39 ans (45,8 %), mais aucune différence significative n'est observée pour le risque relatif en fonction de ces tranches d'âge (Tableau 1).

Le tableau 2 montre la répartition des patientes selon la parité ; cette dernière ne semble pas être liée au développement d'une MHP.

À leur première admission dans notre structure, aucun antécédent de MHP n'a été retrouvé chez nos patientes ; par contre, quatre avaient déjà subi un avortement spontané non molaire.

Le groupage ABO était précisé chez toutes les patientes. Le groupe sanguin O était le plus fréquent et représentait 54,1 % des cas, suivi par le groupe A qui représentait 25,0 % et le groupe B qui représentait 16,7 %. Ces différences ne sont pas significatives par rapport à la population générale (Tableau 3).

Données cliniques

Les différents motifs de consultation sont représentés dans le tableau 4 : les métrorragies représentaient de loin le motif le plus fréquent (79,2 %). Les algies pelviennes étaient retrouvées dans 62,5 % des cas. Elles étaient en rapport avec la présence de kystes lutéiniques (Figure 1) ou l'expulsion de vésicules et d'embryon. Le syndrome toxique était présent chez 12,5 % des patientes. Un syndrome thyrotoxicosique clinique était retrouvé chez une patiente. Ce syndrome comportait une tachycardie, une thermophobie, un tremblement des extrémités et un amaigrissement. La taille utérine était plus élevée par rapport à l'âge gestationnel chez 83,3 % des cas de MHP.

Examens paracliniques

Excepté pour les patientes arrivant avec un tableau évident d'expulsion d'embryon et de vésicules (8,3 %), les dosages de β-hCG réalisés dès l'admission pour les autres ont mis en évidence des taux élevés par rapport à l'âge gestationnel chez 91,7 % d'entre elles.

L'échographie pelvienne et/ou endovaginale a été pratiquée chez toutes les patientes. Elle permettait d'évoquer le diagnostic de MHP dans 87,5 % des cas en objectivant des images dites en « flocons de neige » ou en « nid d'abeilles » avec un embryon. Les kystes lutéiniques étaient retrouvés à l'échographie chez 12,5 % des patientes.

La numération formule sanguine montrait une anémie chez 29,2 % de nos patientes.

Tableau 1 **Fréquence de la môle hydatiforme partielle (MHP) en fonction de l'âge maternel et du nombre de grossesses**

Âge maternel (ans)	MHP		Grossesses normales		Incidence relative des MHP (n/100)	Comparaison par rapport aux accouchements
	Nbre	%	Nbre	%		
< 20	0	0,0	1 269	2,1	0,0	-
20-29	12	50,0	33 286	54,8	0,04	NS
30-39	11	45,8	25 581	42,1	0,04	NS
≥ 40	1	4,2	612	1,0	0,16	-
Total	24	100,0	60 748	100,0	0,04	-

NS = différence non significative.

Tableau 2 **Fréquence de la môle hydatiforme partielle (MHP) en fonction de la parité et son incidence parmi l'ensemble des échecs à la reproduction par avortement**

Parité	MHP		Avortements non molaires	
	Nbre	%	Nbre	%
0	4	16,7	307	18
1	6	25,0	392	23
2	8	33,3	324	19
3	5	20,8	289	17
≥ 4	1	4,2	392	23
Total	24	100	1704	100

Une hyperthyroïdie biologique était retrouvée chez une patiente de notre série, avec un taux élevé des hormones thyroïdiennes et une TSH (*thyroid stimulating hormone* – thyréostimuline hypophysaire) basse.

Traitement et résultats histologiques

Un curetage aspiratif était réalisé chez 83,3 % des patientes. Trois patientes avaient expulsé spontanément, et de ce fait, une intervention ne semblait pas requise. Une patiente était traitée par césarienne devant une hauteur utérine très élevée (36 cm) avec un utérus cicatriciel. Le diagnostic de MHP était ainsi confirmé à l'examen anatomo-pathologique pour toutes les patientes incluses dans cette série.

Surveillance post-môlaire et évolution

Elle consistait en une surveillance clinique (persistance des métrorragies, involution utérine), biologique (dosage hebdomadaire de β-hCG, puis mensuel jusqu'à la négativation) et radiologique (échographie pelvienne de contrôle). Toutes les patientes étaient suivies cliniquement et biologiquement. L'échographie pelvienne était demandée chez toutes les patientes tous les trois mois pendant un an.

À court terme (durant l'hospitalisation), l'évolution était marquée par la disparition des métrorragies avec une involution utérine dans tous les cas ; une régression des taux élevés de β-hCG était notée chez toutes les patientes.

À long terme (en extra-hospitalier), 95,8 % des cas de MHP évoluaient

Tableau 3 **Répartition des groupes sanguins des patientes par rapport à la population générale**

Groupe sanguin	Population générale de 10 000 femmes enceintes normales		MHP		*p*
	Nbre	%	Nbre	%	
O	5000	50,0	13	54,1	NS
A	2600	26,0	6	25,0	NS
B	1711	17,1	4	16,7	NS
AB	689	6,9	1	4,2	NS
Total	10 000	100	24	100	–

MHP : môle hydatiforme partielle.
NS = différence non significative.

favorablement avec disparition des métrorragies, involution utérine et négativation du taux de β-hCG. Une patiente avait évolué vers une tumeur trophoblastique gestationnelle qui était traitée par monochimiothérapie. Elle avait bien réagi au traitement.

Le suivi de nos patientes révélait que 18 d'entre elles (75 %) ont eu une grossesse clinique après la guérison de la MHP. Parmi elles, 14 patientes avaient mené à terme une grossesse normale alors que deux avaient eu une fausse couche spontanée.

Discussion

Le nom de môle hydatiforme vient du mot grec « môle » qui signifie masse et du mot « hydatide » qui signifie sac hydrique. La MHP est un œuf humain pathologique comportant des villosités en transformation vésiculaire, môlaire, mais conservant une forme placentaire reconnaissable et une cavité amniotique avec un embryon, ou des traces d'embryon [1]. Dans le cas des MHC, la dégénérescence hydropique est totale et l'on n'observe aucune trace d'embryon, de cavité amniotique et même de vascularisation [1,2,5,6]. Les MHP représentent 85 % des triploïdies [6], la triploïdie étant définie par un caryotype à 69 chromosomes [1,2]. C'est une situation relativement rare [6,7].

Les MHP, ou môles embryonnées ou encore incomplètes, sont souvent amalgamées avec les môles hydatiformes qui sont complètes, diploïdes et sans embryon. L'ensemble des môles hydatiformes est une entité distincte de la triploïdie, tant anatomopathologiquement que sur le plan diagnostique et évolutif [1,2].

Les MHP surviennent plus chez la femme jeune (pic de fréquence à 27 ans), ayant souvent des antécédents d'avortement spontané [8,9]. Dans notre série, cet antécédent était retrouvé dans 16,7 % des cas. Cette fréquence élevée dans cette tranche d'âge est probablement expliquée par la fréquence de reproduction élevée à cet âge. D'ailleurs, dans notre série, la différence n'est pas significative entre la survenue de MHP et de grossesse normale. Le cas est différent pour la MHC, dont la survenue est très élevée dans les tranches d'âge extrêmes, comparée à la survenue de grossesses normales (différence significative) [2].

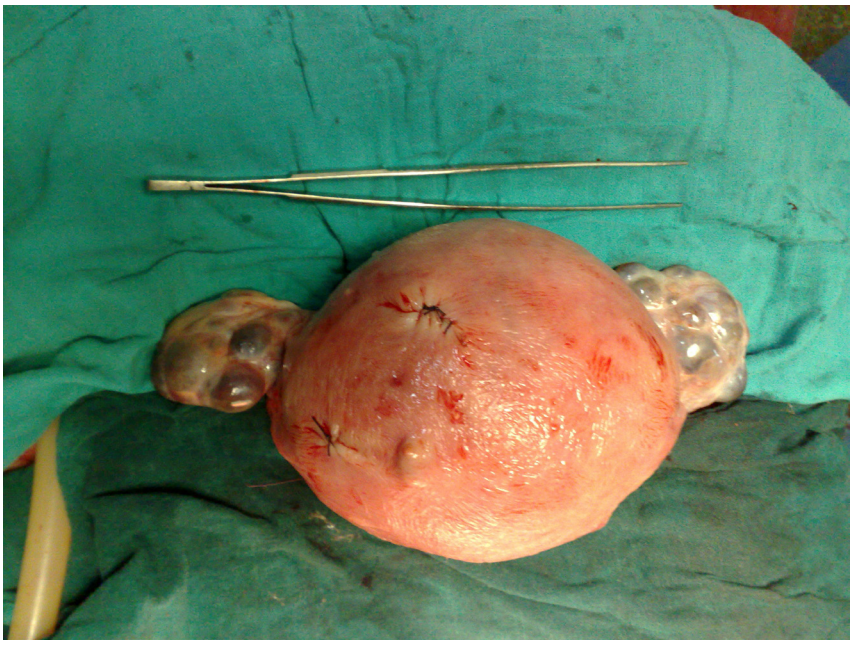

Figure 1 Photo per-opératoire montrant des kystes lutéiniques bilatéraux au cours d'une môle hydatiforme partielle

Dans les MHP, les facteurs de risque connus des môles hydatiformes complètes, notamment l'âge maternel supérieur à 40 ans, la susceptibilité familiale et le groupe sanguin A, ne sont pas retrouvés [1,2]. En effet, l'âge est un facteur plus fortement associé à la MHC qu'à la MHP [2]. Ceci conforte l'hypothèse selon laquelle le risque de fécondation d'un ovocyte anormal est plus élevé au commencement et à la fin de la vie reproductive d'une femme. Il est exceptionnel de décrire une MHP chez une femme âgée de plus de 40 ans [9,10].

Les mécanismes des accidents chromosomiques conduisant à une MHP sont le plus souvent la fécondation d'un ovule haploïde par deux spermatozoïdes haploïdes, c'est la dispermie, ou bien par un spermatozoïde diploïde, c'est la diandrie [11]. La répartition des chromosomes sexuels donne trois types de triploïdies : 69 XXX, 69 XXY,

Tableau 4 Fréquence des circonstances de diagnostic positif de la môle hydatiforme partielle

Circonstances de diagnostic	Nbre	% (*n* = 24)
Métrorragies	19	79,2
Douleurs pelviennes	15	62,5
Exagération des signes sympathiques	3	12,5
Expulsion de vésicules	2	8,3
Thyrotoxicose	1	4,2
Hypertension artérielle	1	4,2

69 XYY. On estime à 70 % les XXY. Les XYY seraient beaucoup plus rares car leur évolution au-delà de quatre semaines seraient impossible. Une nette prédominance de la formule XXX avec des durées de gestation plus longues en cas de triploïdie XXY est retrouvée [12]. La population triploïde a un temps de dédoublement augmenté, ce qui explique l'hypotrophie fœtale, la fréquence des malformations et les taux persistants d'hCG par longévité cellulaire excessive du trophoblaste résiduel [13]. Les taux sanguins maternels très élevés de β-hCG et d'œstriol seraient expliqués par l'expression de gènes portés par le bras long du chromosome 19 paternel, impliqués dans la production hormonale [12].

Le diagnostic des MHP est souvent difficile en début de grossesse, les signes cliniques et paracliniques étant peu caractéristiques [13,14]. Seul un caryotype fœtal permet un diagnostic prénatal de certitude [14]. La présentation clinique est habituellement celle d'une menace d'avortement ou de fausse couche spontanée du premier trimestre avec métrorragies [1]. On retrouve parfois des signes cliniques évoquant le caractère môlaire de la grossesse (vomissements très marqués, hauteur utérine excessive pour le terme et métrorragies d'abondance variable) [14, 15]. Dans ce contexte, c'est l'échographie qui suspecte le diagnostic de môle partielle [7-9,16].

Au premier trimestre, les MHP sont souvent des avortements spontanés, avec des embryons normaux mais hypotrophes dans deux tiers des cas, ou malformés dans un tiers des cas [1,2]. Le placenta est épais, avec parfois des images vésiculaires évocatrices. Le diagnostic de môle embryonnée peut être suspecté dès la dixième semaine de gestation [7,8].

Au deuxième trimestre, les MHP peuvent associer une néphropathie gravidique précoce, sous forme d'une néphropathie gravidique classique (association d'une protéinurie supérieure à 1g/L, d'œdèmes des membres inférieurs et d'une hypertension artérielle) [15] ou d'une atteinte rénale pseudo-glomérulonéphrétique, plus rare mais plus spécifique de la MHP [1]. Cette néphropathie serait due à une colonisation trophoblastique pathologique. Quelques cas de pré-éclampsie, voire de syndrome HELLP, sont décrits avec des MHP tardives [16]. Des métrorragies persistantes, des vomissements rares mais graves et incoercibles, et un excès de volume utérin, qui est dû le plus souvent à l'évolution d'un hydramnios aigu (la hauteur utérine peut être normale ou faible en cas d'hypotrophie ou de mort fœtale), sont retrouvés dans ces cas [16,17]. Une hypertrophie thyroïdienne a été rapportée [17]. Les kystes ovariens lutéiniques sont rares [1,2] ; ils étaient retrouvés dans un cas de notre série.

Les taux excessifs d'hormone gonadotrophine chorionique reflètent l'importance de l'hyperplasie trophoblastique [1]. Le retour à la normale s'effectue en six semaines en moyenne. Le délai de régression est corrélé à l'importance des chiffres initiaux [1,2]. L'alpha-fœto-protéine sérique est élevée même en l'absence de malformation fœtale associée.

L'échographie est extrêmement sensible et spécifique avec des critères diagnostiques bien définis : le placenta est volumineux et hétérogène, une partie du trophoblaste est d'aspect normal tandis que l'autre comprend un tissu d'échogénicité différente, comblant la majeure partie de la cavité et d'aspect en flocons de neige. On y retrouve de nombreuses cavités kystiques caractéristiques [5,7,8]. La présence d'un sac gestationnel est obligatoire pour définir une môle embryonnée. Le fœtus présente un retard de croissance intra-utérin et la grossesse est le plus souvent non évolutive. Deux critères échographiques, lorsqu'ils sont présents, distinguent une MHP dans 87 % des cas [7,8] : d'une part, le rapport mesure transverse sur mesure antéropostérieure du sac gestationnel, qui est supérieur à 1,5 dans les môles ; d'autre part, les modifications morphologiques du sac gestationnel qui est plus irrégulier et l'échogénicité de la réaction décidiuale qui est plus importante au niveau de l'interface placenta-myomètre. La taille disproportionnée de la vésicule vitelline oriente vers une grossesse molaire partielle [7].

Au second trimestre, un retard de croissance intra-utérin (RCIU) sévère et des anomalies morphologiques sont visualisées dans 93 % des cas [1,7]. L'aspecten « gruyère » etl'élargissement du placenta (plus de 4 cm entre 18 et 22 semaines d'aménorrhée) conforte le diagnostic [17]. Cet aspect peut poser le problème du diagnostic différentiel avec dégénérescence hydropique bénigne des villosités placentaires. Dans cette situation, les taux d'hCG sont normaux et le caryotype fœtal, s'il est réalisé, est normal [1].

L'échographie ne dispense pas de l'histologie. Macroscopiquement, le matériel de la MHP est généralement moins abondant que dans la MHC avec un mélange de villosités môlaires et non môlaires. Le fœtus comporte des anomalies, un hygroma cervical [18]. Microscopiquement, contrairement à la MHC, il existe un mélange de villosités môlaires et non môlaires. Le revêtement villositaire forme des invaginations et kystes à double revêtement cytotrophoblastique et syncytiotrophoblastique. Une cavité amniotique et des débris fœtaux sont fréquemment retrouvés [1]. Au caryotype, la MHP est généralement triploïde (69 XXX, 69 XXY ou 69 XYY) [1,2]. L'étude cytogénétique des MHP montre une triploïdie diandrique : deux lots de chromosomes d'origine paternelle et un lot d'origine maternelle [10].

Le diagnostic différentiel de la MHP se pose avec la triploïdie non molaire. Dans cette dernière, deux lots de chromosomes maternels sont retrouvés (triploïdie digynique) et l'arrêt de l'embryogenèse est précoce. Il se pose aussi avec la rétention intra-utérine prolongée avec placenta hydropique [1]. L'étude immunohistochimique à l'aide d'anticorps anti-phosphatase alcaline placentaire montre de petits foyers marqués dans le placenta de décès *in utero* alors que ce marquage est plus diffus dans la môle partielle. Dans ce cas, le caryotype est normal et les taux de β-hCG sont normaux. Les grossesses môlaires partielles peuvent aussi prêter à confusion avec une môle hydatiforme complète associée à une grossesse normale. Dans ce cas, on retrouve un fœtus et un placenta normaux et une môle hydatiforme complète. Les taux de β-hCG sont très élevés et l'alpha-fœto-protéine est normale [19].

Surveillance post-thérapeutique

Une surveillance clinique, échographique et biologique s'impose après évacuation d'une grossesse môlaire afin de détecter précocement toute évolution vers la tumeur trophoblastique gestationnelle [20-22]. Le risque de tumeur trophoblastique gestationnelle (TTG) après une MHP est de 2 à 4 %. Ce risque augmente avec la durée de la grossesse [22-24] et la rapidité de l'intervention humaine. Dans notre série, une patiente avait évolué vers la TTG, qui avait bien répondu sous monochimiothérapie. Les autres cas avaient évolué favorablement après l'évacuation molaire. Nos résultats rejoignent ceux de la littérature qui rapportent une évolution favorable dans plus de 96 % des MHP [1,2]. Le délai entre l'évacuation utérine et le passage à la TTG est court (entre 5 et 18 semaines) par rapport aux MHC. Dans tous les cas rapportés, la rémission a été obtenue par une chimiothérapie [1,22].

La majorité des auteurs suggère de suivre la décroissance du taux de β-hCG plasmatique jusqu'à ce qu'il soit indétectable durant trois à six mois suivant l'évacuation utérine [19].

Une grossesse après l'évacuation môlaire se déroule souvent sans anomalie, mais elle risque de retarder le diagnostic d'une éventuelle tumeur trophoblastique gestationnelle post-môlaire en obscurcissant le monitoring du taux de β-hCG [1,2]. Ainsi, une contraception orale doit être démarrée dès l'évacuation et se maintenir pendant six mois jusqu'à un an après la normalisation du dosage de β-hCG [23].

La récidive d'une MHP est rare. Le risque de récidive est de 0,6 % à 2 % selon les études [1,2]. Sur une série exhaustive de cas, Sebire et al. [24] rapportent un risque de récidive, après un antécédent de MHP, de 1,7 % (25/1512). Ce risque est de 1,9 % après une MHC (27/1417). Le risque de récidive est beaucoup plus élevé chez les patientes ayant une mutation du gène NLRP7 [25].

Le type de môle récidivant est le plus souvent identique au cas antécédent. Sebire et al. montrent que 69 % des récidives sont des MHP et 23 % sont des MHC après un antécédent de MHP, alors que 77 % des récidives sont des MHC et 23 % sont des MHP après un antécédent de MHC [24]. Des cas de récidive à répétition de MHP ont été rapportés. Slim et al. ont montré que certains ovocytes d'une patiente avec mutation du gène NLRP7 ne sont pas en mesure d'empêcher la fécondation polyspermique. Cette mutation expliquerait les récidives de MHP, de même que de MHC, ainsi que l'association de plusieurs types de môles hydatiformes. La mise en évidence de ces gènes permettrait de caractériser la complexité génétique des tissus molaires et d'éviter le gaspillage en matière de reproduction chez certaines patientes [25].

Fertilité après môle hydatiforme partielle

Une grossesse après l'évacuation môlaire est possible et se déroule souvent sans anomalie pourvu qu'elle soit bien suivie. En revanche, une nouvelle grossesse précoce risque de retarder le diagnostic d'une éventuelle tumeur trophoblastique gestationnelle post-môlaire en obscurcissant le monitoring du taux de β-hCG [1]. Un délai de six mois à un an, assorti d'une contraception dont le choix doit être discuté avec la patiente, semble la norme à respecter en cas de MHP. La contraception orale n'augmente pas l'incidence de tumeur gestationnelle trophoblastique post-môlaire. Elle permet de détecter un éventuel regain prolifératif de la môle et de le traiter précocement. Elle doit être démarrée dès l'évacuation et se maintenir de six mois à un an après la normalisation du dosage de β-hCG[23]. Il n'y a pas d'augmentation de fréquence d'avortement spontané, ni de prématurité, ni de malformations congénitales par rapport à la population générale [1,2,23]. Parmi nos patientes qui ont eu une grossesse après leur première prise en charge dans notre service, aucun avortement ni aucune malformation n'étaient notés. En cas de grossesse, une échographie obstétricale doit être effectué le plus tôt possible ; après l'accouchement, le placenta doit être envoyé à l'anatomo-pathologiste et un dosage de β-hCG doit être réalisé à six semaines du post-partum [1,2].

Conclusion

Les MHP constituent un accident génétique relativement rare. Elles présentent des caractéristiques histopathologiques et cytogénétiques ainsi qu'une évolution relativement distinctes des MHC. Des facteurs, notamment l'âge maternel, la parité,

le groupe sanguin, le rôle des facteurs exogènes, ne se trouvent pas associés à la MHP, contrairement à la MHC. Des évolutions au-delà du premier trimestre sont rares mais possibles dans la MHP ; elles se présentent sous forme de môle embryonnée avec un retard de croissance fœtal précoce et majeur. L'échographie tient une place essentielle dans le diagnostic, qui est fortement suspecté sur les critères cliniques et échographiques, et confirmé par l'obtention rapide d'un caryotype fœtal par amniocentèse.

Le pronostic maternel est rarement menacé par l'évolution vers une môle invasive ou une tumeur trophoblastique gestationnelle. Les récidives sont exceptionnelles. Le pronostic fœtal est caractéristique (malformations). La révélation de l'origine paternelle par étude des caryotypes paternels et recherche des marqueurs génétiques ne modifie pas le pronostic, et est donc sans intérêt pratique. Ainsi, accompagnées d'une surveillance et de soins particuliers, les MHP ont souvent une évolution favorable et n'altèrent pas, *a priori*, l'avenir obstétrical de la femme, ni du nouveau-né.

La création d'un centre de référence des maladies trophoblastiques gestationnelles dans notre pays s'avère nécessaire, non seulement pour améliorer le diagnostic et la prise en charge des patientes mais aussi pour élucider certains phénomènes qui génèrent cette maladie.

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تنظيم الأسرة من وجهة نظر طلاب العلوم الدينية: الـمَعَارف والـمَوَاقف والـمُمارَسات

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Knowledge, attitudes and practices among religious students concerning family planning

ABSTRACT To determine the knowledge, attitude and practices concerning family planning of students attending religious schools in Lebanon, we conducted a cross-sectional study of 450 male and female students. A validated structured questionnaire was completed by the students. The majority of the students (65%) had a moderate level of knowledge, males more than females, but females had more positive beliefs and attitudes. More females agreed with family planning programmes and methods than males, but 35% had a negative attitude to family planning; a significant percentage had negative attitudes to contraceptive methods based on their view that they are not allowed (haram) in Islam. Among the married students, less than 40% used a family planning method; of those, the majority used a female method. Religion plays an important role in the health behaviour of religious students. Religious leaders can therefore inhibit or promote family planning, which will affect the success of family planning programmes. Thus, they should be included in the development and promotion of family planning programmes.

الخلاصة: في سبيل تحديد معارف ومواقف وممارسات طلاب العلوم الدينية بالنسبة لموضوع تنظيم الأسرة، أُجرِيَتْ دراسة مستعرضة شملت عينة مؤلفة من 450 طالباً وطالبة مِن طَلَبَة العلوم الدينية من الحَوْزَات العلمية المنتشرة في لبنان. وقد تمت الموافقة على الاستمارة واستكمالها من قبل العينة، وأظهرت النتائج أن غالبية أفراد العينة (65٪) كان لديهم مستوى متوسط من المعارف حول برنامج تنظيم الأسرة، وكان مستوى الإناث أفضل من الرجال. أما بالنسبة للمواقف والممارسات فإن نسبة النساء الـمُتَوافقات مع البرنامج كانت أكثر من نسبة الرجال؛ ومع ذلك كانت هناك نسبة 35٪ من العينة ذات نظرة معارضة أو محايدة للبرنامج، وهي نسبة تستَوْجب تسليط الضوء عليها لأن أفرادها كانوا معارضين للبرنامج من أساسه يعتقدون بالحرمة الشرعية في الإسلام لمختلف وسائل منع الحمل، الوسائل التي ذكرت مباحة في الإسلام بلا خلاف. أما بالنسبة للطلبة المتزوِّجين، فقد أظهرت النتائج أن أقل من 40٪ يستعملون وسائل لمنع الحمل والأكثرية من هؤلاء تستعمل الوسائل المتعلقة بالمرأة، وكانت النساء في العينة أكثر استعمالاً لوسائل منع الحمل من الرجال. وخلصت الدراسة إلى أنه نظراً لأهمية الدين في التأثير على السلوك الصحي، فإن النتائج سوف تساعد على إظهار وفهم دور طلاب العلوم الدينية [الذين سيصبحون مستقبلاً قادة ومراجع دينية مما يستوجب] في إفشال أو إنجاح عملية تبنِّي برامج تنظيم الأسرة، الذي قد يؤثر على تعزيز وإنجاح برنامج تنظيم الأسرة بشكل عام، مما يستوجب إشراكهم في عملية تحضير وتخطيط البرامج، والعمل على الارتقاء بمستوى المعلومات وتحسين المعارف المتعلقة بتنظيم الأسرة.

Connaissances, attitudes et pratiques des étudiants religieux en matière de planification familiale

RESUME Pour évaluer les connaissances, attitudes et pratiques en matière de planification familiale des étudiants fréquentant des écoles religieuses au Liban, nous avons mené une étude transversale auprès de 450 étudiants des deux sexes. Un questionnaire structuré et validé a été rempli par les étudiants. La majorité d'entre eux (65 %) possédait un niveau de connaissances moyen, les étudiants plus que les étudiantes, mais ces dernières avaient des croyances et des attitudes plus positives. Les filles étaient plus nombreuses à approuver les programmes et les méthodes de planification familiale que les garçons, mais 35 % avaient une attitude négative envers la planification familiale ; un pourcentage important avait des attitudes négatives vis-à-vis des méthodes de contraception parce que selon eux, ces dernières sont interdites par l'islam (*haram).* Parmi les étudiants mariés, moins de 40 % utilisaient une méthode de planification familiale ; parmi ceux-ci, la majorité avait recours à une méthode de contraception féminine. La religion joue un rôle important dans le comportement des étudiants religieux en matière de santé. Les chefs religieux peuvent par conséquent freiner ou promouvoir la planification familiale, influant ainsi sur le succès desdits programmes. Il convient donc de les associer à l'élaboration et la promotion des programmes de planification familiale.

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المقدمة

شهد عدد سكان العالم نمواً مستمراً منذ انتهاء المجاعة الكبرى والموت الأسود في 1350، عندما بلغت نحو 370 مليون [1] التوقعات الحالية تدل على الزيادة المستمرة في عدد السكان، مع عدد سكان العالم المتوقع أن يصل إلى ما بين 7.5 و 10.5 مليار بحلول عام 2050 [2]. ولقد دعا بيان الفريق المشترك بين الأكاديميات في النمو السكاني، التي تم التصديق عليها من قِبَل الأكاديميات الوطنية للأعضاء ال 58 في عام 1994، أن هناك نمو في أعداد البشر "غير مسبوق"، وقال إن المشاكل البيئية كثيرة، مثل ارتفاع مستويات ثاني أكسيد الكربون في الغلاف الجوي، والاحتباس الحراري، والتلوث، والتي تفاقمت من جراء التوسع السكاني [3] من مشاكل التزايد السكاني أيضاً ارتفاع في معدل الفقر والبطالة والتي تؤثر على صحة المواطن وارتفاع نسبة الموت والمراضة [4] وقد أخذ صندوق الأمم المتحدة للسكان على عاتقه مهمة التخيف من حدة مشاكل التزايد السكاني في وضع استراتيجيات وتنفيذها في مختلف البلاد [5] تاريخياً. تم البدء بالسيطرة على الازدياد السكاني عن طريق الحدّ من معدل المواليد أو عن طريق الخطط التي وضعت من قِبَل الحكومات، للتخفيف من حدة العوامل مثل المستويات المتزايدة من الفقر، والمشاكل البيئية باستخدام وسائل منع الحمل [6] حيث أن 24000 من النساء يموتون كل عام، 87 في المئة من الوفيات يمكن تجنبه. من هنا تكمُن أهمية تنظيم الحمل [7] وقد ذكرَت منظمة الصحة العالمية في تقاريرها أن حوالي خمس مئة ألف امرأة توفيت سنوياً خلال السنوات العشر الماضية بسبب الحمل والولادة [2] كما ذكرت أن الأطفال الذين يولدون بعد حمل سابق مباشرة أي بعد فترة زمنية تقل عن سنتين هم معرَّضون للهلاك أو المرض خلال السنة الأولى من حياتهم أكثر من غيرهم من الأطفال. كما أن المباعدة بين الأحمال وتجنِّب الحمل المبكر جداً أو المتأخر جداً أي قبل 18 سنة وبعد 35 سنة، تساهم في حماية الأم من المخاطر والمشاكل الصحية [2, 3, 5, 8] وبما أن التزايد السكاني يؤثر على المجتمع فهو بالتالي يؤثر على الأسرة التي هي أقدم بناء إنساني عبر التاريخ وهذا البناء كان وما زال البناء الوحيد الذي يؤمن الحاجات الإنسانية والحياتية للبشرية والمجتمع. ويُعتبر التوالد والإنجاب من أهم وظائف الأسرة، وهي مهمَّةٌ بدأت منذ بدء الخليقة حيث هبط سيدنا آدم إلى الأرض بأمر من ربه وكوَّن الأسرة التي كانت النواة الأولى لتشكيل المجتمع حسبما وَرَدَ في القرآن الكريم: [خَلَقَكُمْ من نفسٍ واحدةٍ وخَلَقَ منها زَوْجَها وبَثَّ منهما رجالاً كثيراً ونساءً ...] [النساء: 1]؛ [واللهُ جَعَلَ لكم مِنْ أنفُسِكم أزواجاً، وجَعَلَ لكم مِنْ أزواجِكُمْ بَنِينَ وحَفَدَة] [النحل: 72].

ولذلك يُقسِمُ الله عزَّ وجلَّ بمَنْ وَلَد وما وَلَد، ويتحدث عن الإنجاب بوصفه بُشرَى وقُرَّةِ عين وزينة الحياة الدنيا: [لا أُقسم بهذا البَلَد، وأنت حِلٌّ بهذا البَلَد، ووالدٍ وما وَلَد] [البلد: 3-1]؛ [يا زكريّا إنا نُبَشِّرُك بغُلام] [مريم: 7]؛ [فبشَّرْناها بإسحقَ ومن وراء إسحقَ يعقوب] [هود: 71] [ربَّنا هَبْ لنا من أزواجنا وذُرّياتِنا قرَّة أعْيُن] [الفرقان: 74].

أما المهمة التالية للأسرة بعد التوالد والإنجاب فهي تأمين الحياة الكريمة للعائلة من حيث الغذاء، والمسكن، والصحة، والتربية والتعليم وتوفير الأمن والسلامة جميعها تقع على عاتق الوالدين، كما أن للمرأة في الأسرة أهميتها أكثر من الرجل فالمرأة صانِعَةُ المستقبل، وهي صلة الوصل بين الأجيال، وحامِيَة الأطفال وراعيَتُهم منذ اللحظات الأولى لاستقرار النطفة الأمشاج في رحمها، مروراً بزمن الحمل ثم الولادة ثم تربية الطفل حتى سن البلوغ وسن الاستقلال عن الأسرة. لذا يجب أن نحمي هذا المخلوق من أي أذى أو ضرر يهدد سلامتها ويبعدها عن تأدية وظيفتها ورسالتها في المجتمع [9].

وقد ذكرت الأبحاث التاريخية أن التزايد السكاني منذ 300 عام كان يسير ببطء جدا ولكن من النصف الثاني للقرن العشرين بدأ هذا التزايد يسير بشكل أسرع، بحيث إن قبل مليون سنة تقريبا بلغ عدد سكان الأرض 10 ملايين شخص وفي زمن النبي عيسى المسيح [ع] ازداد عدد السكان ليصبح 250 إلى 300 مليون شخص وفي سنة 1650 م وصل هذا العدد إلى 500 مليون شخص وهكذا ومع مرور الأيام ازداد عدد السكان بشكل ملحوظ وإذا نظرنا إلى كيفية تطور التزايد السكاني منذ بدء الخلق نجد أن هناك ثلاث فترات لهذا التطور: الفترة الأولى منذ بدء الخلق حتى النصف الأول من القرن التاسع عشر وهذه الفترة تميزت بالتزايد السكاني غير الملحوظ بسبب تفشي الأمراض والأوبئة في تلك الأزمنة والكوارث الطبيعية وعدم وجود الإمكانات الطبية للعلاج والوقاية لذا فان ملايين السنين مرت حتى سنة 1830 حين وصل عدد السكان لمليار نسمة وبعد 11 سنة أضيف لهذا العدد مليار آخر خاصة بعد اكتشاف الميكروب واللقاح وازدادت المعرفة والوعي الصحي بين البشر حيث بدأت الفترة الثانية لتزايد السكان وارتفعت نسبة المواليد مع تدني نسبة الوفيات. أما الفترة الثالثة في السنوات الأخيرة حيث ترافقت مع انتشار وسائل الإعلام وازدياد نسبة التعليم والوعي الصحي وتطور التقنيات ومع وعي أكثر لمشاكل تزايد السكان والمشاكل الاجتماعية والاقتصادية للأسرة ترافقت مع شيوع البطالة وارتفاع سن الزواج وغلاء المعيشة كل ذلك أدى إلى انخفاض ملحوظ في معدل النمو السكاني وهذا الانخفاض المحسوس في نمو السكان ليس هو المطلوب فهو مازال 2.2 كمعدل نمو والمطلوب أن لا يتعدى 1.2 [10].

ولقد انقسم علماء الاجتماع، الاقتصاد، السياسة والدين إلى فريقين موافق على ازدياد السكان ومخالف، ومنذ القدم لفتت هذه المسألة انتباه الفلاسفة وعلماء الأخلاق فمنهم من رأى بازدياد السكان البركة والقدرة للتطور والترقي أما الفريق الآخر فرأى أن التزايد يبعث على فقدان الإمكانات والتهديد بالفقر والفساد الأخلاقي وكان هناك فريق ثالث يعتقد بضرورة ثبات عدد السكان أما بالنسبة إلى الفريق المعارض للتزايد السكاني كان مالتوس أبرز أعضائه وعرف بنظريته عن التزايد السكاني نسبة لتزايد الموارد الذي يشير إلى ازدياد السكان بشكل هندسي أي 2 تصبح 4 ثم 8 وبعد تتضاعف إلى 16 وهكذا وهو يقول إذا أصبحت الأسرة تتألف من ولدين فإن عدد أفراد الأسرة المحتم سوف يقل أو يتزايد بشكل جزئي جداً [10].

وفي هذا المجال ذكرت منظمة الصحة العالمية أن من الحلول المهمة للحد من التزايد السكاني وبالتالي الحد من المشاكل والمخاطر الصحية والنفسية والاجتماعية التي تهدد الأسرة خاصة الأم والطفل، الاستفادة من برامج تنظيم الأسرة وقد وضع هذا البرنامج ضمن استراتيجية وخطة عمل لتحقيق هدف البلدان في تأمين الصحة والسلامة لأفرادها عبر تقديم خدمات الرعاية الصحية الأولية ولقد عرف برنامج تنظيم الأسرة بأنه التخطيط والتنظيم الذي يجده الوالدان من اجل اختيار عدد الأولاد المناسب لهما ومنع الحمل غير المرغوب فيه، كما عرف هذا البرنامج الذي يساعد الزوجين على كيفية الاستفادة من وسائل منع الحمل وإنجاب الأطفال في الوقت

المناسب والملائم لهم وتنظيم الفترات بين الحمل كما يشمل البرنامج المشورة والتثقيف الصحي بالنسبة لتنظيم الأسرة ووظائف الأب والأم [9]. وقد أظهرت الدراسات أهمية الاستفادة من برنامج تنظيم الأسرة وفوائد المباعدة بين الولادات، والتخفيف من الفقر ونتائجه وأيضاً تأمين الأمومة المأمونة والتقليل من نسبة مراضة ووفيات الأمهات [11–14].

أما بالنسبة إلى تاريخ تنظيم الأسرة والاستفادة من وسائل منع الحمل فهو تاريخ قديم، فلقد وجدت في الكتابات الفرعونية قبل 4000 عام بعض النصائح والتعليمات تساعد على منع الحمل مثل تناول حبوب زيت الخروع يومياً خلال الفترة التي يودون عدم الإنجاب خلالها وفي التلمود الكتاب المقدس لليهود قد أوصى النساء بأن يستعملن بعض الأعشاب المغلية كما ذكرت أيضاً كتب أرسطو الفيلسوف اليوناني أساليب متنوعة لمنع الحمل مثل زيت السدر وزيت الزيتون وماء النعناع المقطر مع العسل وغلي أعواد الرمان مع عصير الحامض والكحول أو الخل كما أن في كتاب القانون لابن سينا كثير من وصفات منع الحمل، من هنا نرى أن وسائل منع الحمل كانت موجودة منذ القدم إذا لماذا هذا التزايد السكاني وهل هناك عوامل أخرى ساعدت على ذلك للإجابة على هذا السؤال نرى أن بعض الدراسات ذكرت أن التزايد السكاني يتأثر بثلاث عوامل ومتغيرات هي الولادات والوفيات والهجرة وتكوين هذه المتغيرات يتأثر بعوامل داخل المجتمع مثل العادات والتقاليد، المعتقدات والمواقف والدين ومتغيرات فردية مرتبطة بالمستوى العلمي والاقتصادي أيضاً [10, 15, 16].

مما سبق يمكن أن نقول أن واحداً من الأبعاد المهمة لتنظيم الأسرة هو البعد الثقافي للمجتمع الذي يمثل المواقف، الآراء والقيم والأعراف فمن هذا المنطلق فان ثقافة المجتمعات تلعب دوراً مهماً في طريقة تلقي و قبول أو رفض ومخالفة كل الطرق المطروحة في برنامج تنظيم الأسرة لذا وبناء على ما ذكر فان على الدول التي تود النجاح في تطبيق برامج تنظيم الأسرة أن تجمع أكبر قدر من المعلومات المتعلقة بالمتغيرات المذكورة لاتخاذ الإجراءات المناسبة [17, 18] ومع وجود وسائل متنوعة وطرق مختلفة تتناقلها الثقافات كأساليب لمنع الحمل، إلا أن المعلومات المتناقلة يمكن أن تكون مغلوطة وتشوبها الخرافات وترتبط بالقيم الثقافية واختلاف المذاهب والطوائف ورأي الأديان، لذا فإنها تهدد الاستفادة الصحيحة لوسائل منع الحمل وبالتالي ترتفع نسبة الحمل غير المرغوب فيه [19, 20] كما يجب أن لا ننسى مواقف كثير من الرجال من وسائل منع الحمل حيث يشوبها كثير من الرفض والممانعة وكثير من النساء لا تستعملن وسائل منع الحمل إلا بعد موافقة أزواجهن وقد أجريت كثير من الدراسات لتظهر أهمية دور الرجل في اتخاذ القرار وتبرير السلوكيات المتعلقة بالصحة [21–24] وبما أن الدين يعتبر من العوامل المهمة التي تؤثر على سلوك أفراد المجتمع، كما يعتبر قسم كبير من أفراد المجتمع أن النصوص والأحكام الدينية هي المرجع الوحيد لاتخاذ قراراتهم أو لاتخاذ سلوك معين فهناك كثير من الدراسات أظهرت أهمية الدين في اتخاذ قرارات متعلقة بالصحة وليس فقط تنظيم الأسرة، فقد أظهرت نتائج دراسة أجريت عن تأثير الدين في التوقف عن التدخين نتائج ايجابية [25] وأيضاً عن تأثير الدين الايجابي في اتخاذ القرار لتحصين الأولاد [26] كذلك في الممارسات الجنسية ومرض الإيدز واستعمال الواقي الذكري [27–29] كما أثبتت الدراسات أهمية الدين وأثره الايجابي على نتائج العلاجات الصحية كتخفيض الحرارة، تقليل نسبة البقاء في المستشفى، التخفيف من التهاب المفاصل بالإضافة إلى التخفيف من القلق والاضطراب [30, 31].

وفي الدين الإسلامي هناك نظريات واجتهادات كثيرة ولكن انطلاقا من القرآن الكريم ليس هناك أية تدل على منع أو تحريم استعمال أساليب منع الحمل أو معارضة لتنظيم الأسرة بل هناك بعض الآيات في القرآن الكريم تشجع على الموضوع ولكن بصورة غير مباشرة "..والوالدات يرضعن أولادهن حولين كاملين ... لا تضار والدة بولدها ولا مولود له بولده ...[البقرة 233]...وفصاله في عامين ...[لقمان 14]... حمله وفصاله ثلاثون شهرا... [الأحقاف 15] نلاحظ في الآيات المذكورة إن الله يأمر الأمهات بإرضاع أولادهن حولين كاملين وكما نعلم أن الرضاعة الصحيحة والمتتالية ترفع نسبة هرمون البرولاكتين في الدم مما يؤدي إلى عدم حصول الإباضة لدى المرأة المرضعة وبالتالي لا يحصل الحمل، مع أن الدراسات أثبتت أن الطفل لا يحتاج لحليب الأم كغذاء بعد مرور السنة الأولى من العمر إذا فلماذا أمر الله عز وجل بالإرضاع حولين كاملين؟ فلنتابع الآية الكريمة في سورة البقرة التي ذكرناها بعد الأمر بالإرضاع هناك الأمر بعدم ضرر الأم بالولد أي يجب أن لا يتسبب الحمل للأم التي ترضع أي التي أنجبت حديثا ولا للأب الذي سينفق على الأم والطفل الرضيع والذي سيأتي بعده ولقد ذكرنا مدى الضرر التي تصاب به الأم عند عدم مراعاة الفواصل بين الأحمال وقد طلب منا الله عز وجل مراعاة المباعدة بين الولادات بطريقة غير مباشرة في القرآن حين أمر الولادات بمدة رضاعة وهذا نوع من تنظيم الأسرة وخاصة أن أول من أمر بنظم الأمور هو الدين الإسلامي ولم يأخذ بعين الاعتبار صحة الأم فقط بل وضعية الأب المسؤول عن تأمين حاجات الأسرة . ".. لا يكلف الله نفسا إلا وسعها...[البقرة 286]. حيث تشمل القدرة الجسدية، الصحية، الاقتصادية والاجتماعية [27]. أن القرآن الكريم ذكر أهمية الإنجاب وعدم الرهبنة ولكن مع عدم منافاة لتنظيم الأسرة لأنها لا تمنع إنجاب الأولاد بل ينظمه بنحو عدم إلحاق الضرر بالأم وبرب الأسرة ... المال والبنون زينة الحياة الدنيا ...[الكهف 46]... لا تقتلوا أولادكم خشية إملاق نحن نرزقهم وإياكم ...[الإسراء 31] ...وانكحوا الأيامى منكم والصالحين ...[النور 32, 33]...ولا تقتلوا أولادكم من إملاق نحن نرزقهم ...[الأنعام 151].

ومن ناحية أخرى نجد أحاديث كثيرة للرسول [ص] في نهج الفصاحة عن استحباب إنجاب الأطفال مثل "تناكحوا تناسلوا فاني مباهي بكم الأمم يوم القيامة" وأيضا "تزوجوا الولود الودود" فإنها لا تعني أنها أيضاً مخالفة لتنظيم الأسرة بل تعني مخالفة لعدم إنجاب الأطفال بتاتاً، كما أن الولود هي التي تنجب الأطفال أي عكس العاقر ولكن لا تعني كثرة الإنجاب بدون دراسة أو تنظيم ومن الأكيد أن الرسول[ص] لن يباهي بأمة كثر عددها وقلة حيلتها فأصبحت ضعيفة وواهية بل سيباهي بأمة منظمة قوية وسليمة ويباهي بنوعية الأمة وليست كميتها كما أنه يجب أن لا ننسى أن من أسباب التكاثر والتناسل في صدر الإسلام أن المسلمون كانوا يعانون من القلة في العدد والأعداء كانوا أكثر عدداً "إن يك منكم عشرون صابرون يغلبوا مائتين" مع كثرة الحروب كان من الواجب في حينها تكاثر عدد المسلمين [32, 33]. وعن الرسول [ص] أيضاً في نهج الفصاحة "قلة العيال إحدى اليسارين" هنا يوصي الرسول [ص] بشكل غير مباشر بالتقليل من الأولاد لأنها تساعد في تيسير أمور كثيرة صحياً، اقتصادياً واجتماعياً [33] في الفتاوى الشرعية لمراجع

وعلماء دين طوائف مختلفة ذكروا أن ليس هناك مانع من استعمال وسائل تنظيم الأسرة بشرط عدم ضررها وعدم مخالفة الأحكام الشرعية العامة عند استعمالها مثل استخدام اللولب يحرم استخدامه إذا ترافق ذلك النظر أو ملامسة العورة لدى النساء حتى من قِبَل طبيبة أو قابلة أنثى إلا إذا روعي النظر والملامسة للعورة فيصبح حلالا [35,34]. بالنسبة إلى نظرة علماء الدين من ناحية القوانين والأنظمة الاجتماعية في الدول فقد ذكر في إحدى خطب الجمعة عن موضوع تنظيم الأسرة أن على كل دولة وضع القوانين والأنظمة التي تساعدها على التطور والرقي وان الإسلام لم يحرم تنظيم الأسرة بل يوصي بتنظيم الأمور الحياتية وان الذين يريدون تحريم تنظيم الأسرة عليهم أن لا يلصقوه بالدين الإسلامي [32] كما جرى إصدار فتاوى بخصوص الإسقاط في اندونيسيا من قبل مجلس الأمة لتظهر ضرورة تدخل الدين في أمور الصحة الإنجابية [36].

من هنا وإذا أردنا اللجوء إلى سياسة تطبيق برامج تنظيم الأسرة في المجتمع علينا أن ندرس المجتمع والعوامل المؤثرة على سلوك أفراده حتى يتسنى لواضعي الخطط والبرامج وضع خطة مبنية على تعزيز العوامل الايجابية في المجتمع وحذف العوامل السلبية فمن هنا ومن هذا المنطلق ونظرً لأهمية الدين وبرنامج تنظيم الأسرة اعتمد الباحث على الدراسات المشابهة التي أجريت في السابق في اختيار متغيرات البحث والتي تحد من قبول أفراد المجتمع لبرامج تنظيم الأسرة فكان من العوامل المهمة لقبول أو عدم قبول برامج تنظيم الأسرة أو استخدام وسائل منع الحمل هو عامل الدين ولهذا وبحيث إن طلاب العلوم الدينية سيتحولون في المستقبل إلى مراجع أو مرشدون أو مستشارون وسيكون رأيهم مسموع ومقبول لدى فئة كبيرة من الناس لذلك رأى الباحث ضرورة تقييم المعلومات والمواقف وكيفية تطبيق تنظيم الأسرة لدى هذه الفئة من المجتمع وعلى أساس النتائج يمكن وضع البرامج والخطط فيما بعد عبر إجراء دراسة تهدف إلى تقييم مستوى المعرفة وتحديد المواقف الايجابية والسلبية والسلوك الإنجابي لدى الفئة المستهدفة. [30,28,25] وستكون أول دراسة عملت على تحديد وجهات نظر فئة معينة من أفراد المجتمع تؤثر بشكل مباشر على وجهات نظر من حولهم بحيث لم يجد الباحث دراسات على هذه الفئة من قبل.

أهداف الدراسة

- تحديد مستوى المعلومات ونوعية المواقف والسلوك نسبة إلى موضوع تنظيم الأسرة
- تبيين العلاقة بين العوامل الدموغرافية والمتغيرات المرتبطة [معرفة، مواقف، سلوك]
- شرح تحليلي من وجهة نظر الباحث لتنظيم الأسرة في الإسلام من خلال المراجع المتوفرة.

نوع الدراسة

من النوع المقطعي الوصفي التحليلي والتي تعتمد على تحديد المتغيرات المرتبطة بموضوع تنظيم الأسرة كالمعرفة والسلوك ودراستها وتوصيفها ودراسة العوامل المحيطة والمؤثرة وتحليلها.

طريقة إجراء الدراسة واختيار العينة

أثبتت الدراسات الأولية بالنسبة إلى موضوع تنظيم الأسرة أن 18٪ من الطلاب لديهم قليل من المعلومات و28٪ مواقف مخالفة لموضوع تنظيم الأسرة لذا ومع احتساب 5٪ نسبة الخطأ كان حجم العينة 450 طالباً، أجريت الدراسة على 450 طالباً من طلبة العلوم الدينية في الحوزات العلمية الموجودة في مناطق الجنوب والبقاع وبيروت في لبنان حيث وزعت الاستمارة بعد الحصول على الموافقة من مدراء الحوزات ومن الطلاب أنفسهم وشرح أهداف الدراسة وأهميتها وضمان سرية المعلومات وعدم ضرورة ذكر الاسم على الاستمارة تم اختيار العينة بشكل عشوائي طبقي نسبة لعدد الإناث والذكور لمجتمع الدراسة في مختلف الحوزات والموزعون على مختلف السنين الأربعة الدراسية فكان المجموع 150 طالبة و300 طالب حوزوي.

وسيلة جمع المعطيات

استُعملت استمارة الاستبيان لجمع المعطيات، وكانت تحتوي على أربعة أقسام تشمل ثمانين سؤالاً: قسم يحتوي على أسئلة ديموغرافية وتشمل العمر والجنس والسنة الدراسية والحالة الاجتماعية وعدد الأولاد في حال الزواج ومدة الزواج؛ وقسم يحتوي على الأسئلة المتعلّقة بالمعارف، وهي تشمل أسئلة عن برنامج تنظيم الأسرة: الفوائد والمضارّ، وعن أساليب منع الحمل وفوائدها ومضارِّها؛ وقسم يتناول الأسئلة المتعلِّقة بالمواقف وهي تشتمل على أسئلة تتعلق بوجهات النظر بالنسبة لتزايد السكان وبرامج تنظيم الأسرة، وأساليب منع الحمل. وقد وُزِّعت الإجابات حسب طريقة لا يكرت من 0 إلى 4. والقسم الأخير يتناول الأسئلة المتعلِّقة بالممارسات وتشمل مدى تطبيق برنامج تنظيم الأسرة، ودرجة الاستفادة من وسائل الحمل، وأسباب عدم الاستعمال. وقد تم إجراء دراسة ارتيادية واختبار إحصائي بالإضافة إلى مراجعة أصحاب الاختصاص والدراسات السابقة لتحضير الاستبيان وتحديد مصداقيته وصلاحيته.

النتائج

تم استرجاع 329 استمارة وكانت نتائج التوزُّع بالنسبة للعمر بين الإناث والذكور على الوجه التالي: 49٪ ذكور و41٪ إناث توزعت بين 17 إلى 22 سنة و 45٪ ذكور و38٪ إناث توزعت بين 23إلى 28 سنة و9٪ ذكور 17٪ إناث.

أما بالنسبة للتوزُّع النسبي لوضع التأهل حسب الذكور والإناث فكانت النتائج على الوجه التالي: المتزوجون: 55٪ ذكور و80٪ إناث 39٪ ذكور و12٪ إناث؛ مُطَلَّقون أو غير مذكور: و6٪ ذكور 8٪ إناث.

أما نتائج مستوى المعرفة فإنها تظهر في المخطط رقم [1] بالنسبة للذكور والإناث.

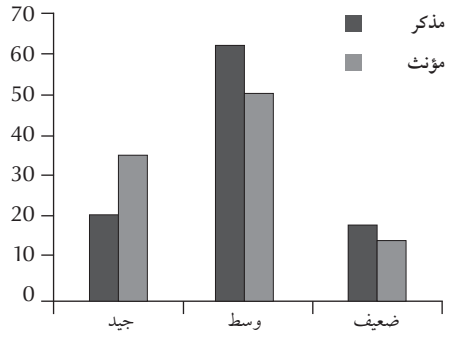
أساليب منع الحمل حسب الذكور والإناث لطلاب الحوزات العلمية للعينة

وأما نتائج نوعية المواقف من حيث الموافقة أو المخالفة لموضوع تنظيم الأسرة، فإنها مبنيَّة في الشكل – 2.

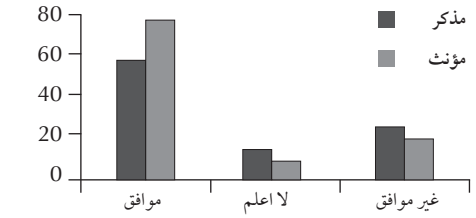
لموضوع تنظيم الأسرة مصنَّفةً حسب الجنس لطلاب الحَوْزات العلمية للعينة

وأما النتائج من حيث ممارسات تنظيم الأسرة واستعمال وسائل منع الحمل، فإنها مبيَّنة في الشكل – 3.

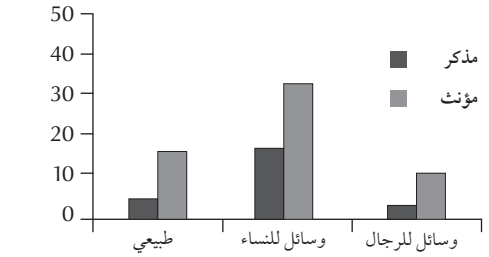
وأخيراً فإن الشكل – 4 يبيِّن وجهات النظر المخالفة لوسيلة منع الحمل على خلفية الحرمة الشرعية.



الشكل 1 التوزُّع النسبي لمستوى المعارف بالنسبة لموضوع تنظيم الأسرة: أساليب منع الحمل حسب الذكور والإناث لطلاب الحوزات العلمية للعينة



الشكل 2 التوزُّع النسبي لنوعية المواقف الموافقة من حيث أو المخالفة لموضوع تنظيم الأسرة مصنَّفةً حسب الجنس لطلاب الحَوْزات العلمية للعينة

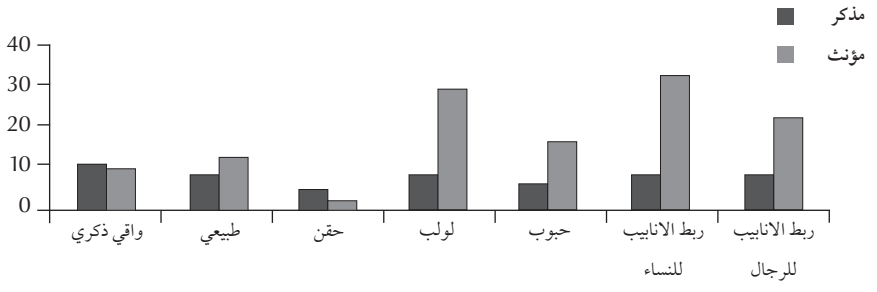


الشكل 3 التوزُّع النسبي لطرق منع الحمل المستعملة مصنَّفة حسب الجنس لطلاب الحوزات العلمية للعينة

على خلفية الحرمة الشرعية مصنَّفة حسب الجنس لطلاب الحَوْزات العلمية للعينة. كما أن النتائج قد أظهرت ارتباط العوامل المحيطة بمستوى المعارف، الموقف والممارسات بالنسبة لتنظيم الأسرة. فقد لُوحِظَ ترابُطٌ يُعْتَدُّ به إحصائياً [$P<0.001$] بين العمر، وسن الزواج، والجنس، وعدد الأولاد، السنة الدراسية وبين المواقف بالنسبة إلى تنظيم الأسرة وقُلْ مثل ذلك بين مستوى المعارف والعمر، وسن الزوج أو الزوجة وعدد الأولاد الذكور والإناث، عدد الأولاد المطلوب والمستوى الدراسي. في حين لُوحِظَ ترابُط عكسي بين سن الزواج والمواقف، علماً بأن نسبة المواقف الإيجابية قد ارتفعت بارتفاع مستوى المعارف.

المناقشة

يتبيَّن من النتائج أن هناك نسبة كبيرة من العيّنة تتراوح بين 17 إلى 28 سنة لدى الذكور والإناث بنسب متقاربة؛ وهي – كما لا يَخْفَى – شريحةٌ من المجموعات الشابة التي هي على طريق تحصيل العلم واكتساب الخبرة. مما يستدعي العمل أكثر على هذه الفئة لتحقيق الهدف المطلوب كما يُلاحظ أن نسبة المتزوجات الإناث كانت 80٪ مقابل 55٪ للمتزوجين من الذكور مما يعزِّز بعض الأرقام التي حصلنا عليها بالنسبة لاختلاف المواقف. ولقد كانت نسبة المعارف لدى الأكثرية متوسطة، وكانت نسبة المعلومات الجيدة لدى الإناث 30٪ مقابل 20٪ للذكور. ومع ذلك فقد كانت هناك نسبة 18٪ من الذكور مقابل 16٪ من الإناث ممَّن كانت نسبة معارفهم متدنِّيَة يجب العمل على الارتقاء بها وتحسينها تمشِّياً مع ما ذكرته منظمة الصحة العالمية عن نشر الوعي والمعرفة لدى فئات المجتمع عن موضوع تنظيم



الشكل 4 التوزُّع النسبي لوجهة النظر المخالفة لوسيلة منع الحمل على خلفية الحرمة الشرعية مصنَّفة حسب الجنس لطلاب الحَوْزات العلمية للعينة

الأسرة. كما تشابهت النتائج بالنسبة إلى المعارف مع معظم الدراسات السابقة [17].

أما بالنسبة للمواقف بالنسبة لتنظيم الأسرة، فإن الأكثرية كانت لديها مواقف إيجابية من برامج تنظيم الأسرة [62٪ ذكور مقابل 70٪ إناث]، ومع ذلك فيجب أن نلاحظ أيضاً أن هناك نسبة 38٪ من الذكور و30٪ من الإناث وهي نسبة لا بأس بها، لديها نظرة مُعارِضة لتنظيم الأسرة أو مُحايِدَة، مما يستوجب التوقف عند هذه النتائج والتفكير في كيفية تحسين تلك المواقف التي تؤثر في المستقبل على نجاح تطبيق أيِّ برنامج يتعلق بتنظيم الأسرة، بالنسبة للمخالفين فكانت أسباب مخالفتهم حسب ما أظهرت النتائج، الضرر، مخالفة الزوج، الألم، والخوف والحرمة الشرعية والتي تهم الباحث لإلقاء الضوء عليها أكثر فحسب ما ذكرنا في المخطط فهناك نسب مئوية لا بأس ممَّن بها يعتقدون بالحرمة الشرعية للواقي الذكري أو حرمة الوسائل الطبيعية أو الحقن، و32٪ يعتقدون بحرمة اللولب، و22٪ يعتقدون بحرمة الأقراص، و29٪ يعتقدون بحُرْمة تعقيم الرجال. مما يدل على وجود نسب كبيرة تعتقد بحُرْمة وسائل لم يحرِّمها الدين تحريماً صريحاً. ومن هنا تتَّضح أهمية وخطورة هذا الموضوع الذي قلَّما تناوله الباحثون في الدراسات السابقة؛ لاسيَّما وأن هؤلاء الطلاب سيكونون أبواقاً مُعارِضة لبرامج تنظيم الأسرة ولن يَرُدُّوا على أفراد المجتمع بشكل إيجابي عند سؤالهم من قِبَل الأهل والأصحاب والجيران وسائر المستمعين لهؤلاء الطلاب. ومن المعلوم أن طالب الهندسة هو عند عامّة الناس: مهندس، وطالب الطب عند العامَّة طبيب وطالب العلوم الدينية مرجع ديني ومن الملفت أن مع قلة عدد الأولاد وانخفاض سن الزواج تزداد نسب المعارضين لبرامج تنظيم الأسرة، ومع ارتفاع عدد الأولاد وسن الزواج تزداد نسب الموافقين لبرامج تنظيم الأسرة. فهل ينبغي الانتظار سنوات لتحسين المواقف؟

توصيات

- السعي إلى إشراك علماء الدين في وضع السياسات الخاصة بمواضيع تنظيم الأسرة، وشرح أساليب منع الحمل وكيفية استعمالها، لتحديث الفتاوى والاجتهادات.
- دعوة علماء الدين إلى حلقات عملية بُغْيَةَ تحسين معارفهم وتعزيز المواقف الإيجابية لديهم بالنسبة للمواضيع الخاصة بتنظيم الأسرة.
- تعزيز دور الممرضات والقابلات بالمشاركة في تغيير السلوك المجتمعي بالنسبة لبرامج تنظيم الأسرة، من خلال تعزيز الزيارات المنزلية ونشر التوعية الصحية.

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Insecticide susceptibility status of the malaria vector *Anopheles arabiensis* in Khartoum city, Sudan: differences between urban and periurban areas

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حساسية الأنوفيلة العربية الناقلة للملاريا لمبيدات الحشرات في مدينةالخرطوم، السودان: الاختلافات بين المناطق الحضرية ومحيطها

أسامة سيد أحمد، محمد عبد الماجد، ماشير مصطفى، أبراهام منزافا

الخلاصة: أصبحت مقاومة العوامل الناقلة للأمراض لمبيدات الحشرات من العوائق الرئيسية التي تقف في مواجهة تدابير الوقاية من الملاريا. وقد أجرى الباحثون مسحاً للمعلومات الأساسية في مدينة الخرطوم في السودان خلال الفترة أيلول/ سبتمبر – تشرين الثاني/ نوفمبر 2007، لتحديد مواقع حساسية الأنوفيلة العربية الناقلة للملاريا لمبيدات الحشرات، ولدراسة ارتباط ذلك باستخدام مبيدات الحشرات في الزراعة الحضرية. وقد أجريت اختبارات الحساسية لمبيدات الحشرات في ستة مواقع خافرة تمثل طبقات حضرية ومحيطة بالحضر من المدينة. وتمَّ حساب معدلات موت وسقوط النواقل الناجمة عن ثمانية من مبيدات الحشرات في 9820 عينة. واتضح أن الأنوفيلة العربية حسّاسة للبنديوكارب (98.1٪)، وللبروبوكسور (100٪)، وللفينتروثيون (100٪)، وللدلتامثرين (99.88٪)، وللامبدا–سيهالوثرين (99.2٪). وكانت معدلات الحساسية تختلف اختلافاً يُعْتَد به إحصائياً بين المواقع الحضرية والمحيطة بالحضر بالنسبة للمَلاثيون (80.8٪ مقابل 56٪)، وللددت (99٪ مقابل 95٪)، وللبيرمثرين (98.5٪ مقابل 96.3). وكان عدد مرات سقوط الحشرات أعلى بمقدار يُعْتَد به إحصائياً في المناطق المحيطة بالحضر منه في الحَضَر بالنسبة للأنوفيلة العربية عند استخدام الدلتامثرين واللامبدا–سيهالوثرين والـمَلاثيون.

ABSTRACT Vector resistance to insecticides is becoming a major obstacle to malaria prevention measures. A baseline survey was carried out in Khartoum city, Sudan, during September–November 2007, to map the insecticide susceptibility status of *Anopheles arabiensis* and to examine the correlation with insecticide usage in urban agriculture. Susceptibility tests were conducted in 6 sentinel sites representing urban and periurban strata of the city. Mortality rates and knockdown times were calculated for 8 insecticides on a total of 9820 specimens. *An. arabiensis* was susceptible to bendiocarb (98.1%), propoxur (100%), fenitrothion (100%), deltamethrin (99.8%) and lambda-cyhalothrin (99.2%). Susceptibility rates were significantly different between urban and periurban sites for malathion (80.8% vs 56.0%), DDT (99.0% vs 95.0%) and permethrin (98.5% vs 96.3%). The 50% knockdown times were significantly higher in periurban than urban populations of *An. arabiensis* for deltamethrin, lambda-cyhalothrin and malathion.

Sensibilité du vecteur du paludisme *Anopheles arabiensis* aux insecticides dans la ville de Khartoum, Soudan : différences entre les zones urbaines et périurbaines

RÉSUMÉ La résistance du vecteur aux insecticides devient un obstacle majeur à l'efficacité des mesures de prévention du paludisme. Au début de l'étude, une enquête a été menée dans la ville de Khartoum (Soudan), de septembre à novembre 2007, pour cartographier la sensibilité d'*Anopheles arabiensis* aux insecticides et examiner la corrélation de cette sensibilité avec l'utilisation des insecticides dans l'agriculture urbaine. Les tests de sensibilité ont été conduits sur six sites sentinelles représentant des strates urbaines et périurbaines de la ville. Les taux de mortalité et les effets de choc ont été calculés à partir de l'étude de 9820 spécimens au total et de huit insecticides. *An. arabiensis* était sensible au bendiocarbe (98,1 %), au propoxur (100 %), au fénitrothion (100 %), à la deltaméthrine (99,8 %) et à la lambda-cyhalothrine (99,2 %). Les taux de sensibilité étaient très différents entre les sites urbains et les sites périurbains pour le malathion (80,8 % contre 56,0 %), le DDT (99,0 % contre 95,0 %) et la perméthrine (98,5 % contre 96,3 %). Les effets de choc de 50 % étaient nettement plus longs pour les populations d'*An. arabiensis* dans les zones périurbaines que dans les zones urbaines pour la deltaméthrine, la lambda-cyhalothrine et le malathion.

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Introduction

Vector resistance to insecticides is becoming a major obstacle to malaria prevention measures especially in periurban ecosystems in the main cities of Africa [1]. Khartoum, the capital of Sudan, has grown from a population of 245 000 in 1955 to 5.27 million in 2008 [2]. Both built-up and urban agricultural areas have expanded in response to high demand for accommodation and food. However, the relative rate of expansion varies between the city's districts, due to differences in landscape and the livelihoods of the local community [3]. Concurrently, urban agriculture has been pushed from the metropolitan zone (urban areas) to the peripheral zone (periurban areas).

Malaria constitutes a major public health problem in Khartoum, leading to about 300 000 cases and 500 deaths each year on average [4]. *Anopheles arabiensis* is the sole malaria vector species in Khartoum [5]. The main vector control intervention in Khartoum city is larval control using Temephos® EC50, with a focus of intervention activity in the urban areas of the city. Environmental management through weekly drying of irrigation canals (intermittent irrigation) is practised in the periurban areas of the city. Space spraying of insecticides and insecticide residual spraying is occasionally used when adult mosquito densities increase or when a malaria outbreak is expected. Coverage with insecticide-treated bednets is still very low in the city despite ongoing scale-up in other parts of Sudan [6].

Effectiveness of malaria vector control requires sound management of the use of insecticides to avoid or delay the development of vector resistance [7]. Elucidating the susceptibility status of local populations of *An. arabiensis* to insecticides is therefore essential, particularly in urban settings that may be influenced by small-scale landscape and livelihood variations. In the present study a baseline survey was carried out in Khartoum city, during the period September to November 2007, to elucidate the susceptibility status of *An. arabiensis* to 8 different insecticides. The results were examined with respect to potential pressure of insecticide usage in urban agriculture.

Methods

Study area

Khartoum city lies within the savannah region of Sudan, characterized by a short rainy season (July to September), a short winter season (December to February) and a relatively longer summer season. Two types of study sites were selected, urban and periurban, based on the presence and magnitude of urban agriculture compared with the built-up area, and the usage of insecticides in the site. Accordingly, the following 6 sites were selected in greater Khartoum: Arkewiet and Soba West (Khartoum); Abu'siid and Essalamania West (Omdurman); Elmaygoma and Eltmanyat (Bahry).

Qualitative data on urban agriculture and insecticide usage

Qualitative data on usage of insecticides for urban agriculture were obtained from site visits, interviews, the records of the National Pesticides Council, the Sudanese Agrochemical Association, and sellers in the local market of pesticides in Khartoum city. Of all the 17 agricultural pesticides registered for use in the Sudanese market we tested the 8 insecticides recommended by WHO for use in public health and malaria control.

Mosquito collection and rearing

Mosquito specimens were collected from the field as larvae and pupae using scoops, pipettes and collection nets [8]. These were reared in trays on rice powder, and then transferred to adult cages as pupae. Emerging females and males were fed on sucrose 10% solution until they were ready for testing (1–3 days old). In accordance with World Health Organization (WHO) recommendations [9], susceptibility tests were conducted on F1 generations of larvae collected from the monitored sites. The tests were conducted in the entomology facility in the malaria department of Khartoum state.

Identification and molecular work

Polymerase chain reaction (PCR) assays in sub-samples of tested specimens (n = 990), using taxonomic keys [10], confirmed identification of *Anopheles arabiensis* as the sole member of *An. gambiae* complex. PCR method was based on specific DNA nucleotide differences in the intergenic spacer of ribosomal DNA (rDNA) [11]. The identification of each *An. gambiae* complex specimen to the level of molecular requires 2 PCR reactions [12]. The DNA was extracted from a single mosquito using a DNA extraction kit (Qiagen) with 1 uL of the DNA amplified in a 24 uL PCR mix containing PCR buffer, 2.5 mM $MgCl_2$, 0.2 mM of each dNTP, 12.5 ng primer UN 5′-GTG TGC CCC TTC CTC GAT GT-3′, 6.25 ng primer AR 5′-AAG TGT CCT TCT CCA TCC TA-3′, 25 ng primer QD 5′-CAG ACC AAG ATG GTT AGT AT-3′, 12.5 ng primer ME 5′-TGA CCA ACC CAC TCC CTT GA-3′ and 0.9 U DNA polymerase (AmpliTaq). The PCR condition with an initial step of 10 min at 94°C, followed by 30 cycles each consisting of 30 s denaturation at 94 °C, 30 s annealing at 50 °C and 30 s extension at 72 °C with the final cycle products extended for 7 min at 72 °C . All identified specimens belonged to *An. arabiensis* (Figure 1).

Insecticide susceptibility tests

Insecticide susceptibility tests were conducted following WHO standard procedures [13] using impregnated papers provided by WHO in March 2007.

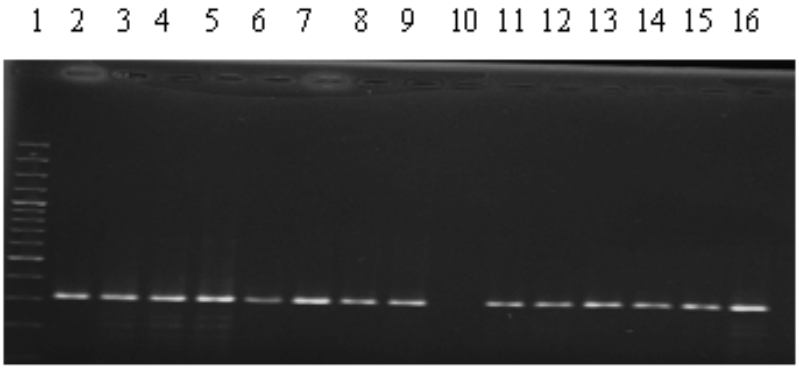

Figure 1 Two PCR assays confirm identification of *Anopheles arabiensis* as the sole member of *An. gambiae* complex in greater Khartoum. Lane 1: 100 kb molecular markers; lanes 2, 3, 4: Shambat and Eltamanyat samples; lanes 5, 6, 7: Soba West; lanes 8, 9: Almaygoma; lane 10: negative control; lanes 11, 12: Alhaj Yousif; lanes 13,14: Alshegalab; and lanes 15, 16: Arkewit

Insecticidal activities of the papers were confirmed by testing a sample against a reference colony of *An. arabiensis* (Dongola strain) previously identified as free of resistance.

Adult females and males aged 1–3 days old were tested separately by aspirating 15–25 mosquitoes each into exposure and control tubes. In each sentinel site, similar sample sizes of 100 specimens of females and males were conducted, where this was attainable.

A standard exposure time of 1 hour was used for all the tested insecticides except for fenitrothion 1.0% for which the exposure was 2 hours. During the exposure time, the numbers of knocked down mosquitoes were recorded after 10, 15, 20, 30, 40, 50 and 60 min. At the end of the exposure time, mosquitoes were transferred into holding tubes, provided with 10% sucrose solution and allowed a 24 h recovery period, after which mortality was recorded.

Control groups were composed of either adult females or males (where appropriate). These were exposed to control papers (impregnated with silicone oil, Risella oil or olive oil depending on tested insecticide group) for 1 h or 2 h. Temperature and relative humidity were measured during the test period using a thermohygrometer.

Test conditions

The mean ambient temperature and humidity recorded inside the laboratory at the start of the test were 26.7 [standard deviation (SD) 0.6] °C and 46.4% (SD 2.4%) respectively. Similarly, the mean temperature and humidity inside the testing room after 24 h of the test were 27.5 (SD 0.7) °C and 45.7% (SD 2.2%), respectively.

Data analysis

Mortality rates after insecticide exposure were calculated as the number of dead mosquitoes/total tested for each test replicate, where no mortality in the control replicate was found. In the case of 5%–20% mortality in the control group, the mortality rate of the test group was adjusted using Abbott's formula [14]. Mortality > 20% was not observed in any of the control replicates. The mean mortality rate was determined across all cohorts of mosquitoes tested for a particular insecticide in a specific sentinel site. Mann–Whitney analyses were used to verify whether there were significant differences between females and males, while Kruskal–Wallis tests were used to determine if there were any significant differences between sentinel sites. WHO criteria were used to evaluate the resistance/susceptibility status of the tested mosquitoes: susceptible (≥ 98% mortality), suspected resistance (97%–80% mortality) and resistance (< 80% mortality).

The exposure times to achieve 50% and 90% knockdown (KDT50 and KDT90) were estimated by the log-time probit model using the *LdP Line*® software. Calculations of knockdown resistance ratio (KRR) were made with reference to the sentinel site with the shortest time. Student t-tests were conducted to compare the results from urban and periurban sentinel sites.

Results

Urban agriculture and insecticide pressure in urban and periurban sites

Table 1 presents a summary of the landscape of the study areas (geographical coordinates, types of breeding sites, population density and land use). The census from the administrative localities shows that total cultivated area in the urban sites represented 3.8% compared with 63.5% of the total area in the periurban sites. Transformation of land usage into a built-up area was reported at 2 urban sites: Soba West and Abu'siid, where the agriculture area had decreased along the Nile banks to less than 10% of the total land area. Agriculture in periurban sites comprised large private and cooperative schemes. Field crops (wheat and maize), vegetables and fodders (clover, alfalfa and sorghum bicolour) were the main cultivated plants.

The total planted area and pesticides usage at the study sites are summarized in Table 2. It is clear from the subtotals of the insecticide concentrations that on average about 90% of the total quantities of agricultural insecticides were used in periurban sites compared with about 10% in the urban ones. The 2 organophosphates, mainly malathion, represented about 93% of the sprayed agricultural insecticide concentrations,

Table 1 Landscape of the study areas of Khartoum city: geographical location, types of breeding sites for *Anopheles arabiensis*, human population density and land use

Area	Geographical coordinates	Main breeding sites[a]	Population density[b] (/km²)	Agricultural area[c] (ha)	Built-up area (ha)
Arkewit	15°53′ N 32°56′ E	Water tanks; indoor sites; broken pipes	> 750	0	5000
Soba West	15°49′ N 32°67′ E	Reservoirs; tanks	> 750	199	4000
Abu'siid	15°59′ N 32°45′ E	Broken pipes; tanks	> 750	317	4000
Elmaygoma	15°65′ N 32°65′ E	Canals; pools	101–250	989	700
Esalamania West	15°36′ N 32°45′ E	Canals; ditches; pools	101–250	1376	800
Eltamanyat	15°99′ N 32°56′ E	Canals; pools; ditches	51–100	1113	500

[a]Main types of breeding sites are listed according to their importance: reservoirs = reservoirs of brick-making factory; broken pipes = broken water pipelines; indoor sites = inside houses and public and private institutions; tanks = watertanks in buildings under construction; canals = leaks from irrigation canals; ditches = water ditches on riverbanks; pools = pools inside the planted area.

[b]Population density provided from the census of the Sudan Central Bureau of Statistics.

[c]Crop composition in the study sites included: vegetables (mainly potatoes, onions, egg plant, okra, tomatoes, leafy vegetables, cucumbers and spices), fruits (bananas, citrus and mangoes) and crops (sorghum, alfalfa and maize).

while pyrethroids represented 7% of the total quantities used at the study sites.

Descriptive data

The total number of tested specimens was 9820, of which 4842 were females. Specimens were grouped into 396 exposure replicates, with 194 of these consisting of female exposures. No significant differences were observed in the mortality of males and females tested for particular insecticides, nor within each sentinel site ($P > 0.05$). The numbers of specimens tested for each insecticide in the sentinel sites are shown in Table 3. Control cohorts included 3085 specimens (151 replicates).

Results of susceptibility tests

In all areas of Khartoum city combined, *An. arabiensis* was susceptible to all the tested insecticides with the exception of suspected resistance to dichlorodiphenyl-trichloroethane (DDT) (total mortality rate 96.9%) and permethrin (97.4%), and confirmed resistance to malathion (69.1%) (Table 3). Profiles of mortality rates of tested females and males against these 3 insecticides in periurban and urban sentinel sites are shown in Figure 2.

Both male and female *An. arabiensis* were susceptible to DDT in all the urban sites (Table 3). However, some tolerance was observed for specimens from the 3 periurban sites of Eltamanyat (mean mortality rate for females 91.0%, 95% CI: 91.2%–90.8%, and for males 93.0%, 95% CI: 93.2%–92.8%), Elmaygoma (mean mortality rate for females 96.0%, 95% CI: 96.1%–95.9% and for males 96.0%, 95% CI: 96.1–95.9%) and Essalmanya West (mean mortality rate for females only 96.0%, 95% CI: 96.1%–95.9%). The tolerance of DDT correlated with usage of pyrethroids in urban agriculture in the study areas (Spearman rho = 0.88, $P < 0.05$).

An. arabiensis was also tolerant to permethrin in the 3 periurban sites of Elmaygoma (mean mortality rate for females 95.0%, 95% CI: 95.1%–94.9% and for males 97.0%, 95% CI: 97.1%–96.9%), Eltamanyat (mean mortality rate for females 96.8%, 95% CI: 98.9%–94.6% and for males 95.0%, 95% CI: 95.1%–94.9%) and Essalmanya West (mean mortality rate for males only 95.0%, 95% CI: 96.8%–94.6%). The tolerance of permethrin was moderately correlated with usage of pyrethroids in the study areas (Spearman rho = 0.71, $P = 0.11$).

Lower mortality rates for malathion were observed in the periurban sites (mean mortality rate 59.7%, 95% CI: 56.9%–62.5%) compared with the urban sites (mean mortality rate 80.8%, 95% CI: 77.8%–83.9%), and the resistance was strongly correlated with agricultural usage of organophosphates in the study areas (Spearman rho = 0.91, $P < 0.05$). In addition, females in the periurban areas were significantly more resistant to malathion (mean mortality rate 52.3%, 95% CI: 50.8%–53.8%) than were males (mean mortality rate 67.0%, 95% CI: 66.4%–67.6%) ($t = 10.07$; $P < 0.001$).

The resistance differences between urban and periurban areas in Khartoum were statistically significant for malathion ($t = 8.57$, df = 46, $P < 0.001$), DDT ($t = 4.17$, df = 31, $P < 0.001$) and permethrin ($t = 2.03$, df = 39, $P < 0.05$).

Table 2 Estimated quantities of insecticides used in urban agriculture in the 6 study areas of Khartoum city as per spraying cycle

Area	Insecticide EC (dosage rate)[a,b]						
	Organophosphates		Pyrethroids				
	Malathion 57% (4.77 L/ha)	Chlorpyrifos (4.76 L/ha)	Cybermethrin 10% (0.24 L/ha)	Deltamethrin 25% (0.36 L/ha)	Lambda-cyhalothrin 5% (0.36 L/ha)	Alpha-cybermethrin 10% (0.34 L/ha)	Permethrin 10% (0.34 L/ha)
Urban							
Soba West	429	0	17	9	9	5	4
Arkewiet	0	0	0	0	0	0	0
Abu'siid	232	0	9	5	5	3	2
Subtotal	661	0	26	13	14	7	6
Periurban							
Esalamania	1883	283	71	21	21	20	20
Elmaygoma	2621	393	98	30	30	28	28
Eltmanyat	1627	200	62	30	30	15	12
Subtotal	6131	875	231	82	82	63	60
Total	6792	875	257	95	96	70	66

[a]*Types of pesticides and usage dosage rates were verified by retailers of the pesticides market in Khartoum city, and National Pesticides Council, Ministry of Agriculture;*
[b]*Dosage rates calculated as litres per planted hectare for each spraying cycle with respect to types of protected plants (Schumacher et al. [3]) (number of spraying cycles varied between the summer/winter seasons).*
EC = emulsifiable concentration.

Knockdown results

KD50 times were higher for specimens from periurban sites compared with urban sites for deltamethrin (t = 2.71, df = 45, P < 0.001) and lambda-cyhalothrin (t = 3.96, df = 46, P < 0.001) (Table 4). Similarly, the KRR of malathion was around 1.6-fold higher in periurban sites compared with the most

Table 3 Mean mortality rates from 8 insecticides of *Anopheles arabiensis* from the different study areas of Khartoum city

Site	Mean mortality rate (%)							
	Bendiocarb 1.0%	DDT 4%	Deltamethrin 0.05%	Fenitrothion 1.0%	Lambda-cyhalothrin 0.05%	Malathion 5.0%	Permethrin 0.75%	Propoxur 0.1%
Urban								
Abu'siid	98.5 (100:100)	99.0 (100:100)	100 (100:100)	100 (100:100)	99.0 (100:100)	76.0 (100:100)	100 (100:100)	100 (100:100)
Arkweit	97.7 (100:200)	99.0 (100:100)	100 (100:100)	100 (100:100)	98.8 (100:100)	78.0 (100:100)	98.4 (100:100)	100 (100:100)
Soba West	98.3 (100:165)	99.0 (100:112)	100 (100:100)	100 (100:100)	99.5 (100:100)	85.5 (100:100)	99.5 (100:100)	100 (114:100)
Periurban								
Elmaygoma	99.0 (100:100)	96.0 (100:100)	99.5 (105:100)	100 (100:100)	98.9 (100:95)	61.0 (107:100)	96 (100:100)	100 (100:100)
Eltmanyat	98.5 (100:100)	92.0 (100:100)	99.5 (100:100)	100 (100:86)	99.5 (100:100)	59.5 (100:100)	95.9 (100:100)	100 (100:100)
Essalamania West	97.5 (100:100)	97.0 (100:100)	100 (100:100)	100 (100:96)	100 (100:100)	58.5 (100:118)	98.0 (100:100)	100 (116:100)
Total	98.1 (1365)	96.9 (1212)	99.8 (1211)	100 (1182)	99.23 (1195)	69.1 (1225)	97. 4 (1200)	100 (1230)

Figures in parentheses (F:M) are numbers of female and male mosquitoes exposed: mortality rate per site was calculated as a mean of males and females. Mann–Whitney and Kruskal–Wallis tests showed no significant difference between females and males (P > 0.05), and between sentinel sites (P > 0.05).
DDT = dichloro-diphenyl-trichloroethane.

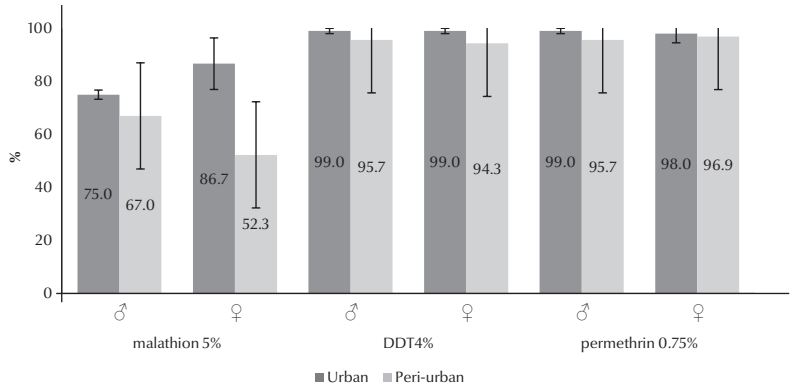

Figure 2 Mortality rates of *Anopheles arabiensis* from urban and periurban areas of Khartoum city after exposure to malathion (5.0%), dichloro-diphenyl-trichloroethane (DDT) (4.0%), and permethrin (0.75%) in World Health Organization insecticide susceptibility tests

susceptible urban site ($t = 6.25$, df = 44, $P < 0.001$) (Table 5).

Discussion

Development of urban agriculture in Khartoum city has coincided with increasing use of insecticides in periurban areas compared with urban ones, where agriculture practices for the latter are now halted or diminished. In this study no chemical analyses for residues of insecticides in the breeding containers were done. However, it was apparent there was an impact of agricultural pesticides on susceptibility of *Anopheles* spp., as shown by differences in the insecticide susceptibility of these populations in agricultural periurban areas and non-agricultural urban ones.

According to the WHO criteria for insecticide susceptibility, evidence for resistance to malathion in *An. arabiensis* in Khartoum city was identified. In addition, suspected resistance to DDT and permethrin was also reported for *An. arabiensis* from periurban areas of Khartoum. On the other hand, *An. arabiensis* in urban areas was susceptible to malathion, DDT and permethrin. In addition, significant differences in knockdown rates between periurban and urban sites were observed for malathion and other 2 pyrethroids. In Nigeria and Ghana, Kristan et al. observed slight differences in the urban/periurban distributions of anopheline fauna and pyrethroid molecular resistance [15].

The results reported here for malathion agree with both historical and recent studies from neighbouring

Table 4 Differences in knockdown times of urban and periurban populations of *Anopheles arabiensis* after exposure to the 4 knockdown insecticides in World Health Organization insecticide susceptibility tests

Insecticide/area	KDT50 (95% CI) (min)	Index	KRR	KDT9 (min)	*t*-test	*P*-value
Deltamethrin 0.5%						
Urban	15.1 (14.7–15.6)	100.0	1	28.6	2.71	0.002
Periurban	18.2 (16.5–20.0)	83.0	1.20	29.8		
Lambda-cyhalothrin 0.05%						
Urban	20.6 (19.1–22.2)	100.0	1	33.2	3.96	< 0.001
Periurban	24.3 (23.2–25.4)	84.8	1.18	37.9		
Permethrin 0.75%						
Urban	22.9 (21.6–24.3)	93.8	1.07	37.5	1.24	0.22
Periurban	21.7 (19.7–23.8)	100.0	1	41.7		
DDT 4%						
Urban	35.4 (33.4–37.5)	94.1	1.06	56.0	1.45	0.154
Periurban	33.4 (31.4–35.4)	100.0	1	60.1		

KDT50 = exposure time for 50% knockdown; KDT90 = exposure time for 90% knockdown; CI = confidence interval; index = the comparative potency index calculated with reference to the lowest KDT50 for the type of insecticide; KRR = knockdown resistance ratio calculated with reference to the lowest KDT50 for the type of insecticide; DDT = dichloro-diphenyl-trichloroethane.

Gezira state [16,17]. However, there is no evidence that malathion resistance is geographically widespread. Based on the reported use of malathion in agriculture [17], resistance is likely to be influenced by land use in periurban parts of Khartoum where there is no aerial spraying of malathion in vector control. In contrast, Lines had argued that in the irrigated scheme in Gezira, malathion resistance was attributed to house spraying rather than aerial crop spraying [16].

The susceptibility pattern of *An. arabiensis* to pyrethroids in Khartoum is inconsistent with recent reports from neighbouring Gezira and Sennar states [17,18], where *An. arabiensis* was reported to be resistant to deltamethrin. It should be noted, however, that there is evidence of use of large quantities of pesticides in agriculture for a long time now in both Gezira and Sennar states. The use of pyrethroids in periurban areas of Khartoum for vegetable farming may be a more recent phenomenon, as confirmed by high knockdown times of deltamethrin and lambda-cyhalothrin from this study.

In this study, no molecular work was conducted to detect either the presence of knockdown resistance mutations or markers of metabolic resistance. Recent studies in Sudan have reported the occurrence of the 2 knockdown resistance mutations (Leu-Phe and Leu-Ser) in *An. arabiensis* populations [17,19]. Further molecular work is needed to explore the possibility of development of multi-resistance patterns of vectors in the city as a result of urban agriculture.

A case study has shown that farmers in Khartoum rely heavily on chemical control for crop protection. The reported misuse of insecticides by farmers is thought to be due to a lack of appropriate cultural practices as well as poor knowledge on pesticide hazards and safety precautions [20]. It is therefore recommended that future studies on insecticide resistance in Sudan should be linked to land use by the community so as not to miss out potential areas under insecticide selection pressure.

In conclusion, strengthened intersectoral collaboration between the agricultural and public health departments is recommended to monitor and manage the impact of the growing market and usage of agricultural pesticides on the emergence of vector resistance. This will ensure that the few arsenals of weapons available for vector control are appropriately preserved.

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Impact of health education on community knowledge, attitudes and behaviour towards solid waste management in Al Ghobeiry, Beirut

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أثر التثقيف الصحي على المعارف والمواقف والسلوك في المجتمع إزاء تدبير النفايات الصلبة في الغبيري، بيروت

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الخلاصة: يؤدي تراكم النفايات الصلبة إلى أخطار واضحة تواجهها البلدان النامية التي تعاني من القصور في جمع ومعالجة النفايات. وتهدف هذه الدراسة إلى التعرف على أثر التدخل بالتثقيف الصحي (القائم على المحاضرات والمناقشات ضمن مجموعات بؤرية) على المعارف والمواقف والسلوك في المجتمع إزاء معالجة النفايات الصلبة في الغبيري، في بيروت، لبنان. وقد قُسمَتْ عينة عشوائية تتضمن 320 من السكان، إلى مجموعتَيْ تدخُّل وشواهد، واستكمل أفرادُها استبياناً قبل التدخل وآخر بعد التدخل. وقد حضرت مجموعة التدخل حصصاً للتثقيف الصحي. وبالمقارنة بينها وبين مجموعة الشواهد تبين وجود تحسُّن يُعْتَد به إحصائياً في المعارف حول المشكلات وحول الأمراض التي تنتشر نتيجة تراكم النفايات الصلبة، وتحسُّن في المواقف تجاه جمع تجميع النفايات الصلبة، وتحسُّن في الممارسات من حيث التعاطي مع النفايات المنزلية وإعادة تدويرها. كما لوحظ ازدياد واضح في مساهمة الناس في حملات التنظيف، وفي العمل التطوعي في جميع الأنشطة البلدية.

ABSTRACT The risks posed by accumulation of solid waste are most obvious in developing countries, where waste collection and treatment is often inadequate. This study aimed to determine the impact of a health education intervention (based on lectures and focus group discussions) on community knowledge, attitudes and behaviours concerning solid waste management in Al Ghobeiry, Beirut. A randomly selected sample of 320 inhabitants were divide into intervention and control groups who completed the same questionnaire in the pre- and post-intervention phases. Compared with the control group the intervention group, who attended the health education sessions, showed: significantly better knowledge about the problems of and diseases spread by accumulation of solid waste; better attitudes to management of solid waste collection; and improved practices in terms of handling and recycling of household waste. There was an observed increased participation by people in cleaning campaigns and voluntary work in all the municipality activities.

Impact de l'éducation sanitaire sur les connaissances, les attitudes et les comportements de la communauté en termes de gestion des déchets solides, Al Ghobeiry (Beyrouth)

RÉSUMÉ Les risques posés par l'accumulation de déchets solides sont criants dans les pays en développement où le ramassage des déchets et leur traitement sont fréquemment inadéquats. La présente étude visait à déterminer l'impact d'une intervention d'éducation sanitaire (composée de conférences et de groupes de discussions thématiques) sur les connaissances de la communauté en termes de gestion des déchets solides, ainsi que sur leurs attitudes et comportements en la matière à Al Ghobeiry (Beyrouth). Un échantillon de 320 habitants a été sélectionné aléatoirement puis réparti soit dans un groupe bénéficiant d'une intervention, soit dans un groupe témoin. Les deux groupes ont rempli le même questionnaire au cours des phases précédant et suivant l'intervention. Par rapport au groupe témoin, le groupe ayant bénéficié d'une intervention sous la forme de sessions d'éducation sanitaire a présenté les caractéristiques suivantes : des connaissances nettement supérieures sur les problèmes causés par l'accumulation de déchets solides et notamment les maladies qu'ils propagent ; des attitudes plus positives à l'égard du ramassage des déchets solides ; et des pratiques améliorées en termes de stockage et de recyclage des déchets ménagers. La participation des habitants aux campagnes de nettoyage et aux travaux volontaires proposés par les municipalités s'est accrue.

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Introduction

Globally, the waste management sector is facing numerous challenges. At present, a staggering 3.4–4 billion tons of municipal and industrial solid waste and up to 300 million tons of hazardous waste is annually produced worldwide [1]. As the volumes and complexity increase, the environmental risks posed by the waste sector—including human health risks, ecosystem degradation, contamination of soils and water, as well as greenhouse gas emissions—also become more serious. These risks are most obvious in developing countries where waste collection and treatment is typically insufficient or even absent [2].

Municipal solid waste (MSW) makes up more than 80% of the total solid waste stream generated in Lebanon. The main sources of solid waste are households, commercial establishments, restaurants, hotels, street markets and street cleaning operations [3]. Currently, Lebanon lacks any comprehensive strategy or efficient system to handle industrial and hazardous waste. [4]. In 2009 Lebanon generated about 1.57 million tons of MSW, and this is expected increase by an estimated 1.65% per year to reach 1.92 million tons by 2020 [3]. The practice of open burning of MSW and old tyres, generates a number of air pollutants and pathogens, while open dumpsites spread bacteria and vector-borne diseases through rats, flies and insects, and also produce foul odours that have a negative impact on the quality of life for the local residents [5].

The awareness, attitudes and behaviours of people in the community are crucial to the management of MSW [6]. Reasons for individual participation in management of MSW are related to environmental motivation, social pressures, attitudes and economic incentives [7]. Problems with MSW management have arisen recently in developing countries where there is a little history of environmental awareness education [8] and where many members of the community are illiterate and unaware of the problem of solid waste accumulation [9]. The aim of this study was to determine the impact of a health education intervention on community knowledge, attitudes and behaviours concerning MSW management in Al Ghobeiry, Beirut.

Methods

Study design

This was a randomized semi-controlled intervention study in which subjects were prospectively and randomly assigned to an intervention or control group, with the intervention being a health education session.

Sample

A sample of 320 subjects was randomly selected from the inhabitants of Al Ghobeiry in the south Beirut suburbs during 2002. According to the relevant municipality report, the inhabitants of the area under investigation were about 1500 families that had come from different Lebanese ethnic and religious groups after the Lebanese war and from different socioeconomic strata. These families were characterized by a low income in comparison with other areas of Al Ghobeiry and a large number of scavengers living in the area [10]. Based on a study showing that 29.5% of women in Al Hermel city of Beqaa were aware about the disadvantages of solid waste, the minimum sample size was estimated as 320 with 95% confidence interval and 5% precision [11].

Subjects were randomly selected from the list of households provided by the municipality with a geographical map. The subjects were the housewives resident at the selected family households or in some cases unmarried male workers who lived on their own [10]. The participants were informed about the study, the main objective and the programme of health education from a municipality advertisement and written informed consent was obtained from all those willing to enter the trial.

Data collection

Implementation of the study was divided into 3 phases: pre-test, intervention and post-test.

In the pre-test phase a questionnaire was completed by the 306 people who agreed to participate in the study. The questionnaire aimed to determine their knowledge, attitude and practices concerning MSW as baseline information and to develop the content of the health education intervention (see later). A team of 3 trained and experienced interviewers completed the questionnaires in door-to-door visits to the selected households. Each questionnaire took about 1 hour to complete and the interviewers finalized data collection within 1 month.

The second phase of the study started after the results of the pre-test had been analysed. Using the sealed envelope technique the sample was randomly divided into 2 equal groups: intervention and control groups (153 subjects in each). Subjects in the intervention group were given the health education programme (see later) that was developed, prepared and tested by the researchers based on the data collected in the first stage and on references and recommendations of the World Health Organization Regional Centre for Environmental Health Activities (CEHA). The control group did not participate in any of the health education activities.

Three months after the educational sessions (starting summer 2002), during which time both groups were presumed to be exposed to the same influencing factors, the interviewers started the third phase of the study. In the post-test phase the questionnaires were redistributed door-to-door and filled in by interview. This questionnaire included direct observations to detect behavioural modifications for both groups. As some of the subjects

were unable to be contacted, only 296 recompleted the questionnaire.

Questionnaire

A structured questionnaire was prepared in Arabic language and reviewing and approved by a panel of specialists and experts from CEHA. It consisted of 4 sections:

- sociodemographic characteristics: 3 questions on participant's age, sex and educational level (close-ended);
- knowledge: 4 questions about problems caused by solid waste accumulation, diseases spread by solid waste and about hazardous wastes (open-ended questions);
- attitudes: a list of 15 questions assessed the inhabitant's opinion about to the importance of waste management, participation in management programmes in the community and community initiatives (closed questions, agree/disagree);
- practices: a list of 5 questions assessed how the inhabitant collected and eliminated household waste and reused solid waste (open-ended questions). At the same time direct observations were made about waste elimination practices using a checklist of items on collection, elimination, segregation and recycling.

Health education programme

The health education intervention was based on lectures and focus group discussion sessions under the supervision of 3 educators who were trained by the researcher. A training of trainers course was conducted during the first stage of the study with 10 volunteers with a health background (6 females and 4 males) who attended the course as a capacity building activity in order to prepare them for the community health education sessions. The course included knowledge about MSW based on CEHA materials and communication skills under the auspices of Al-Ghobeiri municipality and CEHA. After 2 weeks of training, 3 volunteer trainers were selected (2 females and 1 male), and were assigned to conduct sessions with 15–20 inhabitants (the male dealt with 2 groups of male subjects and 2 females each with 3 groups of female subjects).

A total of 8 sessions were conducted with the selected inhabitants over a 2-week period. The teaching materials, e.g. educational brochures, posters and books, used in the educational sessions were prepared and approved by CEHA. Various educational activities were initiated in the lectures and discussion sessions which focused on: kinds of MSW, composition and elements of MSW, disadvantages and diseases related to bad MSW, ways of accumulation, segregation, separation, elimination, reusing and recycling of MSW, the role of community-based initiatives in MSW and hazardous waste.

Data analysis

The data collected were coded, categorized and tabulated as percentages and means. Comparisons were made across 3 groups: the total group (before intervention), the intervention group (after intervention) and control group (after intervention). Chi-squared tests were used for assessing the association between groups and to assess the impact of the intervention, using *SPSS*, version 12.

Results

A total of 306 (95.6%) subjects from the calculated sample accepted to participate in the study and completed the questionnaire in the first phase and 296 (92.5%) completed the questionnaire in the third phase.

Table 1 shows the background characteristics of the groups before and after the intervention. Most of those who were responsible for dealing with MSW

Table 1 Background characteristics of the sample before and after the educational intervention about solid waste management

Variable	Before (total group) (n = 306)		After (intervention group) (n = 150)		After (control group) (n = 146)		Statistics	
							χ^2	P-value
	No.	%	No.	%	No.	%		
Sex								
Male	86	28.1	43	28.7	46	31.5	0.16	0.68
Female	220	71.9	107	71.3	100	68.5	0.16	0.68
Age (years)								
< 20	43	14.1	23	15.3	21	14.4	0.0	1.0
20–30	99	32.4	45	30.0	44	30.1	0.01	0.92
31–40	63	20.6	32	21.3	30	20.5	0.02	0.88
> 40	101	33.0	50	33.3	51	34.9	0.03	0.86
Education level								
No education	73	23.9	39	26.0	42	28.8	0.16	0.68
Secondary	195	63.7	92	61.3	84	57.5	0.3	0.58
University	38	12.4	19	12.7	20	13.7	0.01	0.92

were female (71.9%), a majority were aged less than 40 years old and with secondary level education (63.7%), although there was also a high proportion of uneducated subjects (23.6%). There were no significant differences in the distribution of the variables sex, age and educational level between the groups before the intervention (total group) and after the intervention (intervention and control groups) (Table 1).

Responses to the knowledge questions about handling MSW are shown in the Table 2. The percentage of participants scoring correctly in the intervention group (after intervention) was significantly higher for all knowledge items compared with the control group (after intervention) and with the total group (before intervention) (all $P < 0.005$). Before the intervention only 10.5% of participants saw water pollution as a problem caused by MSW accumulation and this increased to 61.3% after the intervention (versus 16.4% for the control group). Few people (3.3%) thought gastroenteritis was a possible kind of disease spread but this increased to 80.7% versus 8.9% in the control group. Medical waste was not seen as a kind of hazardous waste (0.7 %) until after the intervention, when 91.3% recognised it as a problem. Soil contamination by hazardous waste was only recognized by 2.0% before the intervention but by 90.7 % after it (versus 6.2% of the control group).

Table 3 shows the percentage of respondents with positive answers to the questions about attitudes to handling solid waste (combining agreed and strongly agreed responses). There was a significant difference between groups before and after intervention and between intervention and control groups (all $P < 0.005$). Before the intervention 90.8% of participants agreed that "Waste accumulation anywhere away from home does not lead to the spread of diseases", compared with 12.0% after the intervention (remaining at 92.8% among the controls). Those agreeing that collection of waste in closed container in the house prevents diseases rose from 47.7% before to 91.3% after the intervention. The statement "All family members can participate in reducing and reusing solid waste" was supported by only 5.8 % before the intervention but 90.6% afterwards.

Table 4 shows positive responses to the behaviour questions about solid waste. Calculation of the association between the variables showed that there was a significant difference between the answers before and after the intervention and between the intervention and control groups ($P < 0.005$ in all cases). The proportion of participants reporting that they collected household waste in a bag inside a closed container rose from 19.9% before to 89.3% after the intervention (versus 20.5% in the control group). Similarly removing household waste by placing it in the street when the bag was full fell from 52.9% to 6.0% (versus 52.1% the control group), and the percentages separating and reusing different kinds of solid waste rose from between 0.6% and 3.9% before the intervention to between 86.7% and 95.3% after it, but remained low among the control group (between 0.7% and 4.8%).

Behaviour change towards MSW led to following observed changes: reusing of waste material by collecting and separating the paper, metals, glass, plastic, batteries; reduction in the amount of plastic bags used and their replacement by canvas bags; house-to-house solid waste collection organized by the community; and assigning different colour codes to the litter bins to ease the waste separation process and therefore prevent mix-up of plastics, metals, hazardous and medical wastes.

Discussion

The risk of unhealthy disposal of solid waste is an important issue in many societies, and recycling is considered as a solution for managing solid wastes [12]. The current legislation systems and waste management practices in many developing countries require numerous improvements and modifications. It is argued that such changes need to be accompanied by a community environmental education programme designed to improve citizens' knowledge, attitudes and behaviour [13,14].

The results of our study showed that around 72% of the population sample were female. Women, as homemakers, can play a pivotal role in MSW in organizing waste collection campaigns and other activities related to MSW and helping to motivate other household members towards spreading awareness of good MSW. The important role of women in MSW has been shown in other literatures [15]. Also a large percentage of our participants were illiterate and this showed that to increase awareness about MSW information sources need to be adapted to suit all educational levels, for example using audiovisual media rather than books and brochures. Decision-makers need to take this issue into consideration when preparing television programmes, radio or any related activity. A previous study argued that raising awareness and health education via printed materials was not as effective as using modern promotional technologies [16].

Responses to the knowledge section of our questionnaire showed low awareness among Al Gobeiry city inhabitants about solid waste problems before the intervention. For example only 10.5% of the participants thought that water pollution could be a problem caused by solid waste accumulation, only 3.2% knew about the risk of spreading gastroenteritis, 0.6 % recognized medical waste as a type of hazardous waste and 1.9%.that soil contamination was a problem caused by hazardous waste. A similar study in Yazd, Islamic Republic of Iran about MSW showed that knowledge was low among 34.0% of males and 51.4% of females [12]. The results

Table 2 Correct responses to knowledge questions before and after the educational intervention about solid waste management

Knowledge item	Positive responses to item						Statistics					
	Before (total group) (n = 306)		After (intervention group) (n = 150)		After (control group) (n = 146)		Before vs intervention group		Before vs control group		Intervention vs control group	
	No.	%	No.	%	No.	%	χ^2	P-value	χ^2	P-value	χ^2	P-value
Problems caused by solid waste accumulation												
Spread of diseases	222	72.5	132	88.0	106	72.6	12.9	< 0.001	0.01	0.9	10.1	< 0.001
Water pollution	32	10.5	92	61.3	24	16.4	129	< 0.001	2.70	0.09	60.7	< 0.001
Increased insects	137	44.8	116	77.3	68	46.6	41.9	< 0.001	0.07	0.79	28.4	< 0.001
Increased rodents	52	17.0	60	40.0	34	23.3	155	< 0.001	42.4	0.001	28.4	< 0.001
Bad odours	183	59.8	114	76.0	90	61.6	10.9	< 0.001	0.07	0.79	6.46	0.01
Type of diseases spread												
Gastroenteritis	6	2.0	136	90.7	9	6.2	291	< 0.001	5.39	0.02	151	< 0.001
Eczema	9	2.9	136	90.7	9	6.2	64.8	< 0.001	0.61	0.43	34.4	< 0.001
Diarrhoea	6	2.0	147	98.0	15	10.3	170	< 0.001	2.63	0.10	83.1	< 0.001
Hepatitis	6	2.0	136	90.7	9	6.2	71.9	< 0.001	0.12	0.72	35.7	< 0.001
Scabies	9	2.9	136	90.7	9	6.2	8.7	0.003	0.01	0.92	5.75	< 0.001
Cancer	6	2.0	147	98.0	15	10.3	136	< 0.001	0.79	0.37	66.0	< 0.001
Respiratory disease	6	2.0	136	90.7	9	6.2	24.3	< 0.001	4.55	0.03	35.8	< 0.001
Tetanus	9	2.9	136	90.7	9	6.2	51.5	< 0.001	3.29	0.06	16.8	< 0.001
Type of hazardous waste												
Car batteries	8	2.6	142	94.7	7	4.8	382	< 0.001	0.33	0. 56	235	< 0.001
Industrial oils	14	4.6	138	92.0	17	11.6	342	< 0.001	6.66	0.009	188	< 0.001
Car tyres	6	2.0	118	78.7	6	4.1	295	< 0.001	1.03	0.31	166	< 0.001
Medical waste	2	0.7	137	91.3	2	1.4	386	< 0.001	0.05	0.82	237	< 0.001
Problems caused by hazardous waste												
Soil contamination	6	2.0	136	90.7	9	6.2	365	< 0.001	4.21	0.04	208	< 0.001
Groundwater contamination	9	2.9	136	90.7	9	6.2	354	< 0.001	1.91	0.16	208	< 0.001
Skin burns and patches	6	2.0	147	98.0	15	10.3	373	< 0.001	3.19	0.07	222	< 0.001

Table 3 Positive responses to questions before and after the educational intervention about solid waste management (combining agreed and strongly agreed responses)

Beliefs item	Positive responses to item						Statistics					
	Before (total group) (n = 306)		After (intervention group) (n = 150)		After (control group) (n = 146)		Before vs intervention group		Before vs control group		Intervention vs control group	
	No.	%	No.	%	No.	%	χ^2	P-value	χ^2	P-value	χ^2	P-value
Waste accumulation anywhere away from home does not lead to the spread of diseases	278	90.8	18	12.0	135	92.5	271	< 0.001	0.15	0.69	189	< 0.001
Collection of waste in closed container in the house prevents diseases	146	47.7	137	91.3	78	53.4	79.5	< 0.001	1.07	0.30	51.6	< 0.001
Solid waste management is not our concern	265	86.6	10	6.7	119	81.5	265	< 0.001	1.65	0.20	166	< 0.001
Solid waste management will not affect our health	296	96.7	17	11.3	137	93.8	337	< 0.001	1.4	0.23	198	< 0.001
Landscape outside the home does not matter; the important thing is to have the house clean	286	93.5	12	8.0	129	88.4	321	< 0.001	2.7	0.09	188	< 0.001
Solid waste management is important subject in our life	40	13.1	147	98.0	23	15.8	297	< 0.001	0.39	0.53	201	< 0.001
Maintaining the cleanliness of the area is the responsibility of the municipality only	288	94.1	46	30.7	132	90.4	204	< 0.001	1.54	0.21	108	< 0.001
Collecting the waste in big container in each street is better for the heath of the people	230	75.2	145	96.7	98	67.1	0.01	0.9	2.8	0.09	108	0.17
Neighbourhood committees share a responsibility to prevent waste accumulating	187	61.1	148	98.7	87	59.6	70.9	< 0.001	0.04	0.48	66.6	< 0.001
The best way to reduce waste is reusing and recycling	124	40.5	137	91.3	67	45.9	104	< 0.001	0.96	0.32	69.2	< 0.001
The inhabitants are involved in producing hazardous waste	34	11.1	132	88.0	18	12.3	254	< 0.001	0.05	0.82	166	< 0.001
Paying a penalty is the only way of waste management	26	8.5	23	15.3	14	9.6	4.22	0.04	0.04	0.84	1.74	0.18
All family members can participate in reducing and reusing solid waste	18	5.9	136	90.7	11	7.5	320	< 0.001	0.2	0.6	201	< 0.001
Segregation of solid waste gives additional income to the family	175	57.2	112	74.7	88	60.3	12.4	< 0.001	0.2	0.6	6.3	0.01
Plastic, metal, bottles glass, old clothes and textiles can be reused	287	93.8	148	98.7	116	79.5	4.3	0.03	19.6	0.01	26.3	< 0.001

Table 4 Positive responses to practices questions before and after the educational intervention about solid waste management

Practice item	Positive responses to item						Statistics					
	Before (total group) (n = 306)		After (intervention group) (n = 150)		After (control group) (n = 146)		Before vs intervention group		Before vs control group		Intervention vs control group	
	No	%	No	%	No	%	χ^2	P-value	χ^2	P-value	χ^2	P-value
Where do you collect household waste?												
In a bag inside closed container	61	19.9	134	89.3	30	20.5	195	< 0.001	0	1	139	< 0.001
In a bag inside open container	43	14.1	6	4.0	21	14.4	9.5	< 0.001	0	1	8.4	< 0.001
In a closed container	62	20.3	4	2.7	29	19.9	23.7	< 0.001	0	1	20.3	< 0.001
In an open container	106	34.6	4	2.7	50	34.2	54.4	< 0.001	0	1	47.3	< 0.001
In a bag	34	11.1	2	1.3	16	11.0	11.9	< 0.001	0	1	10.3	< 0.001
How do you eliminate household waste?												
Throw it in the nearest container	90	29.4	95	63.3	44	30.1	46.6	< 0.001	0.01	0.9	33.5	< 0.001
Place it outside door when collectors pass	54	17.6	46	30.7	26	17.8	9.2	< 0.001	0.01	0.9	5.9	< 0.001
Place it in the street when bag is full	162	52.9	9	6.0	76	52.1	92.6	< 0.001	0.01	0.9	13.1	< 0.001
Which kind of waste you separate from other household waste?												
Metal	12	3.9	138	92.0	7	4.8	395	< 0.001	0.03	0.8	222	< 0.001
Glass bottles	11	3.6	143	95.3	5	3.4	360	< 0.001	0.12	0.7	222	< 0.001
Paper and cartons	10	3.3	140	93.3	5	3.4	366	< 0.001	0.04	0.8	236	< 0.001
Batteries	3	1.0	138	92.0	2	1.4	386	< 0.001	0.01	0.9	240	< 0.001
Plastic containers	5	1.6	140	93.3	2	1.4	386	< 0.001	0.1	0.7	257	< 0.001
Organic materials	2	0.7	143	95.3	1	0.7	412	< 0.001	0.1	0.7	262	< 0.001
Medical waste	2	0.7	138	92.0	1	0.7	390	< 0.001	0.1	0.7	244	< 0.001
Textiles	2	0.7	130	86.7	1	0.7	358	< 0.001	0.1	0.7	218	< 0.001
Which kind of waste do you reuse?												
Glass bottles	3	1.0	143	95.3	5	3.4	407	< 0.001	2.1	0.1	246	< 0.001
Computer CDs	2	0.7	130	86.7	1	0.7	358	< 0.001	0.3	0.5	218	< 0.001
Paper and cartons	2	0.7	140	93.3	5	3.4	11.9	< 0.001	3.0	0.06	236	< 0.001
Plastic containers	5	1.6	140	93.3	2	1.4	386	< 0.001	0.04	0.8	247	< 0.001
Organic materials	2	0.7	143	95.3	1	0.7	412	< 0.001	0.3	0.5	247	< 0.001
Textiles	3	1.0	130	86.7	1	0.7	354	< 0.001	0.05	0.8	218	< 0.001

Table 4 **Positive responses to practices questions before and after the educational intervention about solid waste management (*concluded*)**

Practice item	Positive responses to item						Statistics					
	Before (total group) (n = 306)		After (intervention group) (n = 150)		After (control group) (n = 146)		Before vs intervention group		Before vs control group		Intervention vs control group	
	No	%	No	%	No	%	χ^2	P-value	χ^2	P-value	χ^2	P-value
If you reuse some waste how do you reuse them?												
Put the remaining of vegetables as agriculture fertilizers for plant	2	0.7	143	95.3	1	0.7	–	–	–	–	–	–
Offer the remaining of food (fish, meat, chicken, rice, bread) for domestic animals	2	0.7	143	95.3	1	0.7	–	–	–	–	–	–
Keep grains such as rice, lentil and wheat in plastic containers	5	1.6	140	93.3	2	1.4	–	–	–	–	–	–
Reserve liquids such as oils, syrup in glass bottles	3	1.0	143	95.3	5	3.4	–	–	–	–	–	–
Make decorative rugs from remaining clothes and textiles	3	1.0	130	86.7	1	0.7	–	–	–	–	–	–
Make decorative items and trash boxes from computer CDs and cartons	2	0.7	140	93.3	5	3.4	–	–	–	–	–	–

of our study also showed that the attitudes and practices about waste problems were poor among the majority of the inhabitants before the intervention and they had incorrect and inappropriate behaviours towards MSW.

After participating in the health education sessions the intervention group showed highly significant improvements in all items of knowledge. Increases in knowledge about types of diseases spread and types of hazardous waste were particularly pronounced; for example respondents' awareness of hazardous medical waste rose from 0.6% to 91.4%. A study of home-generated medical waste in Mauritius reported that a large proportion of medical waste arising from the domestic environment joined the common MSW stream and ended up in landfills [17]. The authors called for "a national policy on medical waste management be urgently implemented, proper training of waste haulers be offered and education campaign be carried out to sensitize the general public on safe disposal of medical waste" [17].

The health education sessions in our study were also followed by significant increases in awareness as illustrated by changes in attitudes towards MSW. For example before the intervention 90.8% did not agree that "waste accumulation anywhere away from home does not lead to the spread of diseases" and this fell to 12.0% after the intervention. A study in Accra found that the majority of households stored their waste in open containers and plastic bags in the home, which was associated with the presence of houseflies in the kitchen, which in turn was correlated with the incidence of childhood diarrhoea [18]. There were also very marked changes in practices of handling MSW in our study. For example at the start of the study 34.6% of the participants stored their waste at home in an open container. After intervention this decreased to 2.6% in the intervention group and remained at 34.2% in the control group. We also showed a huge improvement in reusing and segregation of MSW among participants after the intervention. Before the intervention only 2 or 3 of the respondents (< 1%) were recycling materials such as bottles and cartons, whereas after the educational sessions between 89%–95% reported recycling these items. This agrees with another study which showed the importance of recycling and segregation. In Agunwamba's cost-analysis in Nigeria the lowest cost option involved encouraging individual households to separate their recyclables, which were bought by scavengers [19].

Finally, our researcher observed many innovations that were introduced after the heath education, for example the old textile waste was used to produce beautiful rugs, the plastic tyres were used as coloured container for plants and swings for children in parks and fairs, dry seeds which usually were considered an useless waste were used

for decorating frames and bowls and the organic waste was used as a soil base for growing plants, etc. The impact of health education also revealed community-based initiatives which were seen in an increased participation by people in cleaning campaigns and voluntary work in all the municipality activities.

In conclusion, a health education programme about MSW based on lectures and discussion sessions was followed by a significant improvement in the knowledge, attitudes and practices towards waste management among participants and led to many reforms in reusing and managing solid waste within this community in south Beirut.

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Short communication

Attending to women's sexual health in Bahrain: does physician's gender make a difference?

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مراجعة النساء لأقسام الصحة الجنسية في البحرين: هل لجنس الطبيب أثرٌ على ذلك؟

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الخلاصة: إن معدلات حدوث العدوى المنقولة جنسياً في البحرين آخذة بالازدياد. وتهدف هذه الدراسة إلى التعرف على الممارسات التي يتبعها الأطباء في مجال الصحة الإنجابية والجنسية للنساء في مواقع الرعاية الصحية الأولية في البحرين، وما إذا كان لجنس الطبيب تأثير على تلك الممارسات. وقد شملت الدراسة جميع أطباء الأسرة المؤهلين في وزارة الصحة عام 2006، وعددهم 217 طبيباً وطبيبة، وجمع الباحثون المعطيات بواسطة استبيان يملأ ذاتياً، وقد بلغ معدل الاستجابة 90.3٪، وكان ما يزيد على نصف المستجيبين (58٪) من النساء، واتَّضح أن الأطباء الذكور لا يقومون بإجراء الفحوصات النسائية ولا بإجراءات التحرِّي عن العدوى المنقولة جنسياً لدى النساء اللواتي لا يشتكين من أعراض، وأن معدلات القيام بذلك منخفضة حتى لدى الطبيبات (28.9٪، و11.4٪ على التوالي). أما من حيث الحديث وتقديم المشورة في ما يتعلق بالصحة الجنسية وعوامل اختطار انتقال العدوى المنقولة جنسياً، فلم يكن هناك اختلافات بين الأطباء والطبيبات في التصدي لهذه القضايا، علماً بأن أقل من 25٪ يتصدّون لذلك. وسوف يستفيد جميع الأطباء والطبيبات من التثقيف المستمر في مجالات الطب الجنسي بغض النظر عن جنسهم.

ABSTRACT There is a rising incidence of sexually transmitted infections (STIs) in Bahrain. This study aimed to determine physician practices with regard to sexual and reproductive health in women in the primary care setting in Bahrain, and to ascertain if physician gender affected these. The study included all eligible Ministry of Health family physicians (217) in 2006 and data were collected by a self-completed questionnaire; the response rate was 90.3%. Over half (58%) of the responding physicians were female. Male physicians did not undertake gynaecological examinations nor carry out STI screening procedures for asymptomatic women, and rates for women physicians were low (28.9% and 11.4% respectively). As regards to identification of and counselling for sexual health and STI risk factors, there were no differences between male and female physicians in addressing these issues with less than 25% doing so. All physicians would benefit from continuing education in the area of sexual medicine regardless of their gender.

Prise en charge de la santé génésique et sexuelle des femmes à Bahreïn : consulter un médecin homme ou un médecin femme fait-il une différence ?

RÉSUMÉ L'incidence des infections sexuellement transmissibles est en augmentation à Bahreïn. La présente étude visait à déterminer les pratiques des médecins dans le domaine de la santé génésique et sexuelle des femmes en établissements de soins de santé primaires à Bahreïn, et cherchait à savoir si le fait que le médecin était un homme ou une femme faisait une différence. L'étude a inclus tous les médecins de famille éligibles travaillant dans des établissements dépendant du ministère de la Santé (217) en 2006. Les données ont été recueillies par auto-questionnaire. Le taux de réponse était de 90,3 %. Plus de la moitié (58 %) des médecins ayant répondu était des femmes. Si les médecins hommes ne réalisaient pas d'examen gynécologique ni de dépistage d'infections sexuellement transmissibles chez les femmes asymptomatiques, les médecins femmes, quant à elles, étaient peu nombreuses à les réaliser (28,9 % et 11,4 % respectivement). Aucune différence n'a été observée entre la pratique des médecins hommes et des médecins femmes concernant l'identification des facteurs de risque pour les infections sexuellement transmissibles et l'offre de conseils pour la santé sexuelle. En effet, ils étaient moins de 25 % à aborder ces questions avec leurs patientes. Tous les médecins, homme ou femme, tireraient avantage d'une formation continue dans le domaine de la médecine sexuelle.

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Introduction

The World Health Organization (WHO) estimates that 2.7 million new cases of HIV occurred throughout the world in 2008 in men and women aged 15–49 years, and in the Middle East, the estimated prevalence of HIV is 0.2% [1].

A rising incidence of sexually transmitted infections (STIs) in Bahrain is giving cause for concern. From 2005 to 2008, reported cases of gonorrhoea increased from 212 to 419 [2]. In the same year (2008), the total number of STIs reported was 918 and under-reporting has been identified as an issue. In one recent study, only 28% of STIs diagnosed by physicians were reported [Al-Dhubaib et al., unpublished audit, 2007]. Part of this problem may lie in the complexity of the reporting system used by the Ministry of Health (MOH). Physicians are required to complete a specific notification form and send it to the nursing section in the health centre for further action; some physicians choose to do so by asking the patient to deliver the form, whereas others complete the task personally. There is a risk that the former approach may result in data loss due to patient confusion, worry about confidentiality or mere lack of time. In short, the reporting system may compound physician reluctance to address sexual health and infection.

Women and men are equally vulnerable to STIs which can have adverse impacts on psychological, physical and reproductive health. STIs, and especially HIV, carry a social stigma, making them a sensitive issue to address for both physician and patient, and this dynamic can be complicated further by physician gender.

In Bahrain, where possible, women patients are cared for by women physicians who conduct all clinics related to women's reproductive health including ante- and postnatal care, and well-woman assessments. Male physicians, in general, care for women in non-elective situations, for example, in emergencies and for episodic care.

Although many patients initially attend primary care services for STIs [3], and primary care is an important and attractive setting for the delivery of sexual and reproductive health care (with the potential for STI control), many primary care physicians feel that they do not have the necessary training and experience to respond to these demands [4].

The aim of this study was to assess physician practices with regard to issues of sexual and reproductive health in women in the primary care setting in Bahrain, and to ascertain what role was played by physician gender.

Methods

A descriptive, cross-sectional survey was carried out in July 2006, in all 21 Ministry of Health primary health care centres in Bahrain, and involved all practising primary care physicians.

A questionnaire, adapted from a previous study and with the permission of the author [5], addressed demographic data and STI-related practice behaviour of those physicians who routinely encountered women patients in their clinical practice.

The self-completed questionnaire in English consisted of 7 statements and participants were asked to respond using a 5-point scale that ranged from "none of the time" to "all of the time". when appropriate The statements were as follows:

- I personally perform routine gynaecological examinations on my patients.
- I test asymptomatic sexually active females in my practice for gonorrhoea.
- I counsel my patients about STIs/HIV transmission and prevention.
- I ask my patients about sexual activity.
- I ask my patients about the use of condoms.
- I ask my patients about the number of past sexual partners.
- I ask my patients about past history of STIs.

A pilot study was carried out on 10 family practice residency programme physicians to assess the questionnaire and the practicality of completing it in the clinic setting. Following this, the questionnaires were personally distributed to and collected from all physicians eligible for inclusion in the study. All primary care physicians working during morning or afternoon shifts and registered with the MOH in 2006 were eligible for inclusion. Physicians who were not currently practising (being in administrative positions), those working as tutors in family practice programmes and those on leave were excluded.

Questions 1 and 2 involved clinical examination as opposed to communication behaviour and so were separated from the rest of the items for analysis. Responses were aggregated into "all of the time when appropriate" and 'less than all of the time" to highlight consistency of behaviour.

Ethical considerations

During the planning phase of the research, permission was sought from the Bahrain Ministry of Health ethical committee. Support for the study was sought and given by the chairmen of the health centres involved.

Participants were given a clear written account attached to the questionnaire of the nature of the study, measures to be taken to protect confidentiality, and the benefit and value of the study, and their informed verbal consent was requested.

Data analysis

SPSS, version 14.0 was used for data analysis. Counts and percentages were calculated for personal data, and chi-squared tests were applied to all items concerning practice behaviour.

Results

Out of a total of 250 physicians, 33 were excluded from the study because of their non-involvement in clinical work or absence on leave; this was ascertained by the official listing of physicians provided by MOH. Thus 217 eligible physicians received a copy of the questionnaire and 196 were returned, a response rate of 90.3%. The response rate among males and females was 94.3% and 87.7% respectively. Of the 21 eligible physicians excluded, 4 declined to participate at the outset and 17 did not complete the questionnaire due to lack of time or losing it. There was no follow-up of physicians who elected not to participate in the study.

Respondents' characteristics

As regards sex and age, 58% of respondents were female and 72.8% were over 35 years. Around 70% were graduates of the family medicine residency programme and the remainder were general practitioners, and 75% had been in primary care practice for more than 5 years.

Physician practices

With regard to the first item in the questionnaire, none of the male physicians undertook gynaecological examinations and few of the female physicians performed gynaecological examination and gonorrhoea screening (Table 1). Only 1 male physician answered positively to testing asymptomatic sexually active females for gonorrhoea.

No significant differences were found between male and female physicians with regard to STI counselling, and enquiring about history of sexual activity, condom use, sexual partners or past STIs (Table 2). Male physicians were less comfortable talking about sexual activity issues with their female patients. The Pearson chi-squared tests yielded no significant findings in any of the items.

Discussion

We found that no gynaecological examinations were carried out by male physicians, in keeping with local cultural norms. With regard to screening for gonorrhoea, only one male physician answered positively. It can be reasonably inferred that this did not include gynaecological examination. Rates for screening for gonorrhoea by female physicians, however, were low and much lower than rates for gynaecological examination (11.4% versus 28.9%). The reasons for this discrepancy are not clear and require further study.

As regards communication practices relevant to the identification of risks for STIs, preventive measures and sexual history, no significant differences were found that could be attributable to physician's gender. These results are in contrast to other studies' findings, where female gender has been shown to be an important positive factor in the provision of effective STI care and prevention for women [6–9].

In addition, in regions where the cultural norms are different from Bahrain, studies have shown that women patients have a preference for same gender care, which in turn delivers enhanced care [10]. In Bahrain despite the fact that women receive care from female physicians, equivalent "care benefits" are not being realized [Al-Alawi, unpublished research, 2003], and rates of desirable behaviours on the part of women physicians were low in comparison with other studies [11]. The reasons for this were not explored in our study, but the result was surprising given that women physicians have more opportunity to ask their female patients about sexual health issues, as they conduct all clinics pertaining to women's reproductive health.

Clinical practice guidelines regarding sexual health and disease, although not emphasized in antenatal and postnatal protocols, are present in Bahrain. However, it appears that the opportunity to address sexual health issues is not taken. Despite a local residency programme with emphasis on communication and sexual history taking skills, residency training was found not to convey any advantage in rates of desirable practice behaviours. In contrast, other studies, albeit carried out in different cultures, have shown that training in communication skills can have a positive influence on sexual history comfort levels [12].

A number of factors may be responsible for the low level of effective sexual health care behaviour. For example, there may be an over-riding problem in the area of knowledge and skills, as has been demonstrated in research studies carried out in countries as diverse as Pakistan and the United States of America (USA), as well as Bahrain

Table 1 Frequency of performing gynaecological examinations and screening for gonorrhoea by physician's gender

Gender	Performing gynaecological examinations		Screening for gonorrhoea	
	Less than all the time	All of the time	Less than all the time	All of the time
	No. (%)	No. (%)	No. (%)	No. (%)
Male (*n* = 82)	82 (100.0)	0 (0.0)	81 (98.8)	1 (1.2)
Female (*n* = 114)	81 (71.1)	33 (28.9)	101 (88.6)	13 (11.4)
Total	163 (83.2)	33 (16.8)	182 (92.9)	14 (7.1)

Table 2 **Frequency of counselling and history taking by physician's gender**

Gender	Counselling		History of sexual activity		History of condom use		History of previous sexual partners		History of previous STIs	
	Less than all the time	All time	Less than all the time	All time	Less than all the time	All time	Less than all the time	All time	Less than all the time	All time
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Male	69 (84.1)	13 (15.9)	70 (85.4)	12 (14.6)	67 (81.7)	15 (18.3)	70 (85.4)	12 (14.6)	64 (78.0)	18 (22.0)
Female	97 (85.1)	17 (14.9)	94 (82.5)	20 (17.5)	94 (82.5)	20 (17.5)	100 (87.7)	14 (12.3)	91 (79.8)	23 (20.2)
Total	166 (84.7)	30 (15.3)	164 (83.7)	32 (16.3)	161 (82.1)	35 (17.9)	170 (86.7)	26 (13.3)	155 (79.1)	41 (20.9)

P > 0.05 (chi-squared test).

[5,13, Al-Alawi, unpublished research, 2003]. In a study of 1600 physicians in the USA, Wiesenfeld found inadequacies in knowledge of treatment protocols and screening practices resulting in compromised care for women [5].

Further, the lack of emphasis on STI-related clinical practice guidelines for the more formal components of care, such as ante and postnatal care and well-woman examinations, may represent one aspect of care that needs to be addressed by policy-makers.

In Bahrain, in a study of physicians' perceptions of factors inhibiting discussion of sexual health issues with patients, Al-Alawi et al. reported that, in addition to knowledge and skill gaps in terms of human sexuality, limited consultation time, lack of privacy, language barriers and physician embarrassment were the main factors (Al-Alawi, unpublished research, 2003).

The first three of these problems (time, privacy and language) together with the somewhat confusing reporting system in the health centre which might result in negative feedback, are, at first glance, logistical but may veil a more fundamental type of problem. Many problems in the primary care setting are of a psychosocial nature, and time is needed to address them [14]. The need to acknowledge this fact and accommodate its implications is a matter for health care policy-makers to address.

The embarrassment factor is more complex. Its roots may lie in the culture, in ethics, e.g. conflict between individual rights and public health policy, or in an innate modesty and/or shame on the part of physicians and patients, and in physicians' perceptions of their patients' sensitivities (Al-Alawi, unpublished research, 2003). Physician gender as a cause of this reluctance is not well substantiated. For example, Aschka et al., in their study of the management by male physicians of sexual problems in male patients in family practice, found that physician reluctance to address sexual health issues exceeded that of their patients, a finding confirmed by the results that revealed that 84% of male patients considered it important to talk with their family physician about their sexual concerns [15]. More than two-thirds of the patients would have liked their physicians to signal their open-mindedness by directly addressing sexual topics during the consultation [15]. Qualitative research initiatives could shed light on both the roots of physicians' underlying discomfort as well as the expectations of patients, and provide some understanding of the inter-relationships of these interacting dimensions.

The primary health care setting provides an opportunity to attend to clients' sexual health. Given the still relatively low prevalence of HIV and AIDS in most countries in the Eastern Mediterranean region, utilizing this opportunity could help to prevent the spread of HIV/AIDS reaching epidemic status, when these diseases spread beyond the high risk groups [16].

There are some limitations to the study. The responses of the physicians were self-reported and may not correlate with their actual practice. In addition, some physicians may have been less likely to return the questionnaire as it may indicate poor performance.

In conclusion, physicians in primary care in Bahrain, whether male or female, are not giving adequate attention to women's sexual health. For these primary care physicians to perform at a higher functional level in the area of women' sexual health, several approaches should be considered. First, there is a need for physicians to learn the communication skills specific to the area of sexual health. Second, all primary care physicians should have access to continuing medical education workshops that focus on the content of sexual medicine and STIs. Third, women physicians involved in reproductive health should have special access to workshops that deal with current clinical practice guidelines.

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Sexual and reproductive health core competencies in primary care: attitudes, knowledge, ethics, human rights, leadership, management, teamwork, community work, education, counselling, clinical settings, service, provision

Sexual and reproductive health core competencies in primary care sets forth the core sexual and reproductive health (SRH) competencies that are desirable for use in primary health care (PHC). They reflect the attitudes, tasks, knowledge and skills that health personnel in PHC may need, to protect, promote and provide SRH in the community. These competencies serve as the first step for policy-makers, planners, service organizations and academic/training establishments to understand and meet both the education/training requirements and the service-delivery support needed by SRH staff to provide safe, quality SRH care.

The competencies have been developed through a technical consultation of SRH experts in research, education, policy and service, over more than 2 years. The consultation included 2 workshops and many rounds of review in a Delphi-research-style process. A survey on the role of PHC providers in SRH was also undertaken to inform the competency definitions.

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Letters to the Editor

Parental smoking and risk of childhood cancer: hospital-based case–control study in Shiraz

Sir,

I read with interest the paper entitled "Parental smoking and risk of childhood cancer: hospital-based case–control study in Shiraz" by M. Edraki and M. Rambod published in the *Eastern Mediterranean Health Journal* [1].

At the beginning of the manuscript, the authors highlighted the scientific foundations of the issue through a large review of the literature. However, for a case–control study, basic principles related to the methodology must be respected to ensure valid results in accordance with the recommendations of the Strengthening of Observational Studies in Epidemiology (STROBE) statement [2].

First, the authors did not clearly define cases and controls and only indicated the eligibility criteria. They introduce a selection bias in selecting cases from hospital patients and the control group from public schools. The right approach would be to select the control group from the hospital also. Thus, the 2 populations would be comparable in all respects except for the disease (cancer) [3]. Controls chosen from outside the hospital may be different from cases in a variety of respects apart from cancer.

The study appears to have matched cases and controls on age and sex; however the authors performed an unconditional logistic regression analysis. In matched case–control studies conditional regression it is advisable to use in order to avoid getting conservatively biased estimates.

Values from the calculation of the size of the study sample do not seem correct; considering the same parameters and using software such as *Epi-Info*, the sample size should be 108 cases and 108 controls instead of 120 [4].

Finally, the authors did not take into account other variables or potential confounders (e.g. alcohol, food, residence) and did not make adjustments during analysis, which may call into question the conclusions of the article.

Case–control studies should meet the principles of conduct and reporting as outlined in the STROBE statement guidelines.

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Dr Edraki and Dr Rambod were invited to respond to this letter, but no response was received.

Clinical management guidelines for pandemic (H1N1) 2009 virus infection in the Eastern Mediterranean Region: technical basis and overview

Sir,

The recent publication on clinical management guidelines for influenza is very useful and interesting [1]. However, some issues should be further discussed and added to the present guidelines. First, the guidelines should also address possible new or re-emerging influenza infections, not only the 2009 virus. At present, there are warning signs of a new bird flu occurring and this could be a worldwide problem again [2]. Second, the guidelines exist as literature. The important issue is how to implement them and put into actual practice. Assessment of the adherence of practitioners to the guidelines would be useful to perform and could predict their success. Also, a previous report found that different groups of practitioners managed cases differently despite using the same guideline [3]. Therefore it was recommended that specific guidelines be set for less experienced practitioners such as internists [3].

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Dr Al-Hajjar and colleagues were invited to respond to this letter, but no response was received.

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