World Health Organization
Regional Office for the Eastern Mediterranean

المجلة الصحية لشرق المتوسط

EMHJ

Eastern Mediterranean Health Journal

La Revue de Santé de la Méditerranée orientale

World Health Day, 7 April, 2013
Hypertension is a serious health problem both Regionally and globally but it is preventable and treatable. World Health Day 2013 aims to: raise awareness of hypertension and promote behavioural change with respect to its primary prevention, improve the chances of early detection and promote effective management for patients with hypertension.

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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

EST une revue de santé officielle publiée par le Bureau régional de l'Organisation mondiale de la Santé pour la Méditerranée orientale. Elle offre une tribune pour la présentation et la promotion de nouvelles politiques et initiatives dans le domaine des ser-vices de santé ainsi qu'à l'échange d'idées, de concepts, de données épidémiologiques, de résultats de recherches et d'autres informations, se rapportant plus particulièrement à la Région de la Méditerranée orientale. Elle s'adresse à tous les professionnels de la santé, aux membres des instituts médicaux et autres instituts de formation médico-sanitaire, aux ONG, Centres collaborateurs de l'OMS et personnes concernés au sein et hors de la Région.

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المجلة الصحية لشرق المتوسط

EMHJ

Editorial

Universal health coverage

Marie-Paule Kieny[1] and David B. Evans[2]

Universal health coverage (UHC), sometimes called universal coverage, is the aspiration that all people obtain the health services they need without suffering financial hardship paying for them. This requires coverage with a range of promotive, preventive, curative, rehabilitative and palliative services, and in particular coverage with services linked to the current health-related Millennium Development Goals (MDGs) and to noncommunicable diseases and injuries.

UHC is increasingly seen by countries at all income levels as an important goal for their health system development, as reflected in resolutions of governing bodies of the World Health Organization (WHO) (e.g. WHA 58.33 of 2005 and 64.9 of 2011; EM/RC59/R.3 of 2012) and in five recent global ministerial-level meetings, including a joint WHO/World Bank meeting between ministries of health and finance in Geneva in February 2013.

But UHC is also broader than health. By improving people's health, it enables adults to work and earn an income and children obtain an education – allowing many to escape from poverty. By protecting people from financial hardship as a result of paying for health services, it prevents others from being pushed into poverty [1]. Recognizing this, the Member States of the United Nations adopted a resolution in December 2012 (A/67/L.3) emphasizing that UHC was important to overall human development and suggesting that it should be included in the post-2015 development agenda.

Moving closer to UHC contributes to "the enjoyment of the highest attainable standard of health" which, as stated in the WHO constitution, is "one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition" [2]. It is consistent with the concept of "health for all" and the Alma Ata Declaration of 1978 [3].

In addition, within the concept of UHC it is recognized that achievement of the highest attainable level of health is not possible without health financing systems that guarantee financial risk protection and health systems that function appropriately. Only then can people access the health services they need secure in the knowledge that they will not suffer financial hardship as a result of paying for them.

Many factors help countries move closer to UHC and help protect the gains they have already made in coverage with needed services and financial risk protection. Social determinants – the conditions under which people are born, grow up, live, work and age (e.g. levels and inequalities in income, wealth, education and power structures in society) – are important [4]. For example, education helps people not only protect their own health, but to access health services when they need them. Within health systems, the World Health Report of 2010 (*Health systems financing: the path to universal coverage*) focused largely on health financing and more than 80 countries have since requested WHO for technical support to help modify their health financing systems to: raise sufficient funds for health; reduce financial barriers and spread risks across the population through prepayment and pooling; and use the available funds efficiently and equitably [5].

Other parts of the health system are also critical. Service delivery at the primary care level is crucial, ensuring access to integrated health services across all priority health problems. This requires motivated and responsive health workers located close to the population they service [6,7] and adequate supplies of good quality essential medicines and technologies for diagnosis and treatment [8]. A well-functioning referral system allowing integrated management and care supports this, as does sufficient funding for prevention and health promotion services. Systems for generating evidence through research and for collating and analysing the data necessary for informed decision-making and for governing all parts of the health system complete the picture.

It can be technically and politically difficult to adapt all the various components of the health system at the same time while also engaging in intersectoral actions targeting the social determinants of health. Countries must themselves lead in this process, but some will also require support from the global community.

[1]*Assistant Director-General, Health Systems and Innovation, World Health Organization, Geneva, Switzerland.*
[2]*Director, Health Systems Financing, World Health Organization, Geneva, Switzerland.*

The steps that countries can take, with support from WHO where desired, are:

- Undertake a situation analysis of UHC and identify the main obstacles and opportunities within the health system for moving closer to UHC;
- Engage in inclusive policy dialogue with all stakeholders to assess policy options for moving closer to UHC or maintaining existing gains;
- Develop and implement holistic strategies and plans for health systems strengthening to move closer to UHC;
- Engage in intersectoral action designed to encourage health-in-all policies for UHC, focusing on the areas that are likely to have the biggest impact first;
- Monitor, evaluate and adapt plans and strategies as necessary.

People cannot enjoy the greatest attainable level of health, or live long, dignified, healthy, and productive lives without being able to use the health services they need. They cannot use these services if financial barriers threaten them with financial ruin each time they seek care. People want the assurance that good quality health services are available and affordable, the aspiration of UHC.

Moving closer to UHC is not a dream. Momentum is building and increasingly countries at all income levels are developing strategies and policies to move forward and make progress towards UHC.

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Factors affecting the prevalence of chronic diseases in Palestinian people: an analysis of data from the Palestinian Central Bureau of Statistics

H.F. Abukhdeir,[1] L.S. Caplan,[1] L. Reese[1] and E. Alema-Mensah[1]

العوامل التي تؤثر على معدل انتشار الأمراض المزمنة بين الفلسطينيين: تحليل للبيانات المستمدة من المكتب المركزي الفلسطيني للإحصاء

هشام فهمي أبو خضير، لي كابلان، لروي ريس، إيرنست أليما منسا

الخلاصة: تهدف هذه الدراسة إلى التعرُّف على ما إذا كان ثمَّة اختلافات يُعْتَدُّ بها إحصائياً في معدل انتشار السكري، وارتفاع ضغط الدم، والمرض القلبي الوعائي، والسرطان، بين الفلسطينيين، وعلاقتها بالمتغيرات الديموغرافية المختلفة، وذلك باستخدام البيانات الثانوية المستمدة من المكتب المركزي الفلسطيني للإحصاء. وقد تبيَّن للباحثين أن العيش في قطاع غزة هو عامل يضمن الوقاية، إذْ تقل احتمالات إصابة المجموعة التي تعيش في القطاع عن إصابة من يعيش في الضفة الغربية بالسكري بمقدار 21٪، وبارتفاع ضغط الدم بمقدار 35٪، وبأمراض القلب والأوعية بمقدار 48٪. ولم يجد الباحثون اختلافاً يُعْتَدُّ به إحصائياً في ما يتعلق بالسرطان. ولُوحِظ أن كون المرء لاجئاً كان يمثل عامل اختطار يُعتدّ به بالنسبة للسكري والمرض القلبي الوعائي. كما أن الزواج والخطوبة والطلاق والترمل كانت من عوامل الاختطار التي يُعْتَدُّ بها إحصائياً للإصابة بالسكري، وارتفاع ضغط الدم. وكان الجندر من عوامل الاختطار للإصابة بارتفاع ضغط الدم، إذْ إن الإناث معرَّضات أكثر بمقدار 60٪ من الذكور للإصابة بارتفاع ضغط الدم. ثم إن العيش في المواقع الريفية كان عاملاً وقائياً من ارتفاع ضغط الدم، وكما هو المتوقع، فإن العمر أحد عوامل اختطار السكري وارتفاع ضغط الدم وأمراض القلب والأوعية، إلا أن الازدياد في معدل الاختطار كان مثيراً للتحذير؛ إذ وصل لدى من هم في عمر 40–65 عاماً إلى 36 – 434 ضعف ما هو عليه مقارنةً بمن هم في عمر 0–19 عاماً.

ABSTRACT This study determined whether there are significant differences in the prevalence of diabetes, hypertension, cardiovascular disease (CVD) and cancer among Palestinians with respect to different demographic variables using secondary data from the Palestinian Central Bureau of Statistics. Living in the Gaza Strip was a protective factor, with this group being 21% less likely to have diabetes, 35% less likely to have hypertension, and 48% less likely to have CVD than those living in the West Bank. No significant difference was found for cancer. Being a refugee was a significant risk factor for diabetes and CVD while being married/engaged or divorced/separated/widowed was a risk factor for diabetes and hypertension. Gender was a risk factor for hypertension with females being 60% more likely to have hypertension than males. Living in a rural setting was protective against hypertension. As expected, age was a risk factor for diabetes, hypertension and CVD; the magnitude of this increased risk was alarming, 36 to 434 times greater in those aged 40–65 years compared with those aged 0–19 years.

Facteurs affectant la prévalence des maladies chroniques dans la population palestinienne : analyse des données du Bureau central palestinien des statistiques

RÉSUMÉ La présente étude a déterminé l'existence ou l'absence de différences significatives dans la prévalence du diabète, de l'hypertension, des maladies cardio-vasculaires et du cancer chez les Palestiniens par rapport à différentes variables démographiques, à l'aide de données secondaires du Bureau central palestinien des statistiques. Vivre dans la Bande de Gaza était un facteur de protection, car ce groupe avait 21 % moins de risque d'avoir un diabète, 35 % moins de risque de souffrir d'hypertension et 48 % moins de risque d'être atteint d'une maladie cardio-vasculaire que la population cisjordanienne. Aucune différence significative n'a été observée pour le cancer. Être un réfugié représentait un facteur de risque pour le diabète et les maladies cardio-vasculaires, alors que le fait d'être marié/fiancé ou divorcé/séparé/veuf était un facteur de risque pour le diabète et l'hypertension. Être une femme était un facteur de risque pour l'hypertension, celles-ci étant 60 % plus susceptibles d'en souffrir que les hommes. Vivre en milieu rural était un facteur de protection contre l'hypertension. Comme on pouvait s'y attendre, l'âge était un facteur de risque pour le diabète, l'hypertension et les maladies cardio-vasculaires ; l'ampleur de ce risque était alarmante : les Palestiniens âgés de 40 à 65 ans présentaient un risque 36 à 434 fois plus élevé que ceux âgés de 0 à 19 ans pour ces trois problèmes de santé.

[1]*Morehouse School of Medicine, Atlanta, Georgia, United States of America (Correspondence to H.F. Abukhdeir: heshamabukhdeir@gmail.com).*
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Introduction

There are currently 3 separate communities of Palestinians: those living in the West Bank, those living in the Gaza Strip, and those living in Israel. Palestinians living in Israel are under Israeli rule, while those living in the West Bank and Gaza Strip are under Fatah and Hamas rule respectively. Fatah and Hamas have separate health care systems to provide medical care to their citizens. The disease epidemiology of Palestinians is undergoing rapid change as noncommunicable diseases such as diabetes, hypertension, cardiovascular disease (CVD) and cancer are replacing communicable diseases as the main causes of morbidity and mortality [1].

Due to the unavailability of data on Palestinians living in Israel, this study compared Palestinians living in the West Bank and the Gaza Strip. These 2 groups are in fact 1 population separated by geographic and political boundaries. The differences between them with respect to overall quality of health have never been examined extensively.

This study compared the effect of a number of factors, including location, on the prevalence of chronic diseases in Palestinians living in the Gaza Strip and the West Bank using data from the Palestinian Central Bureau of Statistics.

Methods

This study used existing data sets to describe the current health status of the Palestinian people across 2 distinct environmental contexts. Secondary data from the Palestinian Central Bureau of Statistics [2] were obtained. The data had been collected using cross-sectional surveys to gather general health information on the populations of the Palestinian territories. The surveys contained questions asking respondents whether they had been diagnosed with certain diseases, including diabetes, hypertension, CVD, and cancer. The survey questionnaire was designed to be answered by a head of household, who provided information for all other family members. In the absence of the head of household, the person with the highest authority in the household was interviewed.

The target population of the Palestinian Central Bureau of Statistics survey was all Palestinian households within the West Bank and the Gaza Strip. The sampling frame was 260 enumerated areas constructed from the Population, Housing, and Establishment Census 1997 [3]. These enumerated areas were geographic regions similar in size, each containing an average of 150 households. The enumerated areas were divided into smaller units called cells containing an average of 25 households, with 1 cell per enumerated area being surveyed. For the part of Jerusalem that was annexed by Israel after the 1967 war, 30 households were selected from each enumerated area. Interviews were carried out by mobile teams between 20 May 2004 and 7 July 2004.

The number of households in the sample was 6574: 4456 in the West Bank and 2118 in the Gaza Strip. The response rates for the 2 regions were 84.1% and 96.9% respectively [2].

Statistical analysis

The dependent variables in this study were presence or absence of diabetes, hypertension, CVD and cancer. The independent variables included region, sex, returnee status, refugee status, school attendance status, educational attainment, labour force status, smoking status, number of cigarettes smoked daily, marital status, locality type, age grouping, and type of health insurance.

Region defined where the respondent lived and was categorized into the West Bank and the Gaza Strip. Returnee status defined those surveyed as being a returnee or a non-returnee. A returnee is someone who returned to Palestine after moving to another country during times of war. Educational attainment was a measure of the level of education attained by the respondent. Locality type (domicile) was categorized as urban, rural, and refugee camp. Age was categorized into young people (0–19 years), young adults (20–39 years), older adults (40–64 years) and seniors (65+ years).

Frequency distributions were run on each of these variables to ensure they were representative of the population. Bivariate analyses were performed comparing each of the independent variables with each of the dependent variables, and chi-squared analysis was used to determine any statistically significant associations.

The results were used to guide the selection of independent variables to be included in the logistic regression models, which were constructed to determine the effects of each of the independent variables on the prevalence of diabetes, hypertension, CVD and cancer, controlling for all the other variables in the models.

All analyses were conducted using *SPSS*, version 17.0. $P < 0.05$ was considered statistically significant.

Results

The prevalence of diabetes, hypertension, CVD and cancer are shown in Figure 1. People living in the Gaza Strip were less likely to have diabetes, hypertension and CVD than those living in the West Bank.

Table 1 shows the results of the bivariate analyses performed for diabetes, hypertension, CVD and cancer. Females were more than twice as likely to have hypertension as males and were also more likely to have diabetes. Those who had never attended school were about 3 to 4 times more likely to have diabetes, hypertension and CVD and twice as likely to have cancer as those who attended school and either dropped out or graduated. Those who were illiterate were 4 or more times

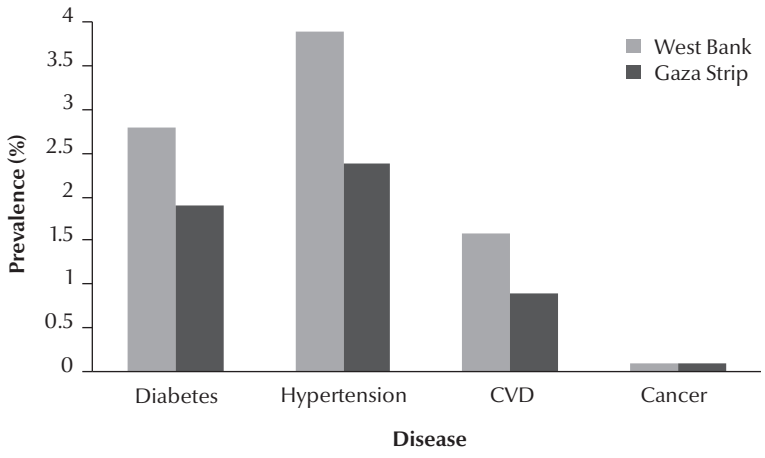

Figure 1 Disease prevalence in the West Bank and the Gaza Strip, 2004 (CVD = cardiovascular disease)

more likely to have diabetes, hypertension, CVD and cancer than those with higher levels of educational attainment. Those who were unemployed were at least 3 times more likely to have all 4 diseases compared to employed people. Ex-smokers were about 4 times more likely to have diabetes, 3 times as likely to have hypertension, 7 times as likely to have CVD, and 7 times as likely to have cancer as those who had never smoked. Prevalence of all 4 diseases increased in those who smoked at least 40 cigarettes a day.

Those who were divorced/widowed/separated were many times more likely to have diabetes, hypertension or CVD than those in the other marital status categories and 50 times as likely to have cancer as single people. Seniors were about twice as likely to have diabetes, hypertension, and cancer and about 3.5 times more likely to have CVD than older adults, who were in turn much more likely to have these diseases than those under 40 years old.

Table 2 shows the results of the multivariate modelling using logistic regression. None of the variables for cancer were statistically significant, thus, only the results for diabetes, hypertension and CVD are shown. Females were 60% more likely to have hypertension than males. Non-refugees were 33% less likely to have diabetes and 46% less likely to have CVD than refugees. Full time students were 90% less likely to have hypertension and 80% less likely to have CVD than unemployed people. People involved full-time in household chores were about 25% less likely to have diabetes and hypertension and 37% less likely to have CVD. People living in the Gaza strip were about 21% less likely to have diabetes, 35% less likely to have hypertension, and 48% less likely to have CVD than people living in the West Bank.

Being married/engaged was shown to be a significant risk factor for diabetes and hypertension, with the odds of each of these diseases being about 2.9 and 2.6 times as high, respectively compared with single people. The odds of having diabetes and hypertension were over 3.5 times as high in divorced/widowed/separated as in single people, and this was statistically significant ($P < 0.0001$).

Those living in a rural setting were 23% less likely to have hypertension. The odds of diabetes, hypertension and CVD tended to increase with increasing age.

Having Ministry of Health insurance was a significant risk factor for diabetes and CVD and having Israeli health insurance was a significant risk factor for diabetes and hypertension, while having Social Welfare Health insurance was a significant risk factor for diabetes, hypertension, and CVD.

Discussion

This study was unique in that it focused on comparing the Palestinians living in the West Bank and the Gaza Strip as 2 different entities, as opposed to lumping all the Palestinians together. Husseini et al.'s study on cardiovascular diseases, diabetes mellitus, and cancer did give some prevalence statistics comparing the Gaza Strip and the West Bank, but they were limited to people over 40 years who were registered refugees [1]. Given the fact that each region is controlled by a different political party and that the effects of this extend all the way to the health systems, it seems more appropriate to consider the 2 groups separately.

Our results showed significant differences in the prevalence of cancer, hypertension, CVD and diabetes between Palestinians living in the Gaza Strip and those in the West Bank, with those living in the Gaza Strip having a lower prevalence of all 4 diseases. Further studies are required to understand these findings because data from the Food and Agriculture Organization of the United Nations (2003) state that the Gaza Strip has a higher rate of food insecurity, is poorer, and has an overall lower socioeconomic status [4].

Being a refugee tended to be a risk factor, as would be expected. Refugees often live with poor housing conditions, which are not favourable to long term healthy outcomes [5].

Smoking is a proven risk factor for diabetes, CVD, and cancer and is associated with hypertension, so its protective effect against hypertension in this study is surprising [4]. Smoking in this culture has many different uses. For many people, it is way to feel accepted, or to show off, or is a response to peer pressure

Table 1 Bivariate analyses of diabetes, cardiovascular disease (CVD), and cancer according to selected variables

Factor	Diabetes		Hypertension		CVD		Cancer	
	No.	%	No.	%	No.	%	No.	%
Region								
West Bank	570	2.8	802	3.9	337	1.6	21	0.1
Gaza Strip	247	1.9	306	2.4	112	0.9	13	0.1
P-value	0.0001		0.0001		0.0001		0.981	
Sex								
Male	374	2.2	367	2.2	214	1.3	19	0.1
Female	443	2.7	741	4.5	235	1.4	15	0.1
P-value	0.005		0.0001		0.205		0.54	
Returnee status								
Returnee	16	3.4	20	4.2	7	1.5	3	0.6
Non-returnee	801	2.4	1088	3.3	442	1.3	31	0.1
P-value	0.201		0.289		0.821		0.013	
Refugee status								
Refugee	365	2.6	471	3.3	208	1.4	19	0.1
Non-refugee	452	2.4	637	3.4	241	1.3	15	0.1
P-value	0.318		0.754		0.148		0.128	
School attendance status								
Currently attending school	10	0.1	7	0.1	12	0.1	3	0.01
Attended school and dropped out	292	4.4	379	5.7	148	2.2	10	0.2
Attended school and graduated	247	3.7	311	4.6	113	1.7	11	0.2
Never attended school	263	11.1	409	17.3	165	7.0	9	0.4
P-value	0.0001		0.0001		0.0100		0.0001	
Educational attainment								
Illiterate	268	16.9	418	26.3	165	10.4	7	0.4
Can read or write	140	4.0	179	5.1	77	2.2	5	0.1
Elementary[a]	161	2.7	211	3.6	85	1.4	4	0.1
Preparatory[b]	106	1.7	128	2.0	48	0.8	6	0.1
Secondary	61	1.7	84	2.3	27	0.7	2	0.1
Intermediate associated level diploma[c]	39	4.1	46	4.9	14	1.5	3	0.3
Bachelor degree	34	2.5	39	2.9	14	1.0	2	0.1
P-value	0.0001		0.0001		0.0001		0.008	
Work status[d]								
Employed	151	2.9	164	3.1	57	1.1	7	0.1
Unemployed	371	9.3	480	12.0	252	6.3	15	0.4
Full-time student	4	0.01	1	0.01	4	0.01	1	0.01
Involved full time in household chores	283	4.9	460	7.9	117	2.0	6	0.1
P-value	0.0001		0.0001		0.0001		0.0001	
Smoking status[d]								
Mostly cigarettes	130	3.5	119	3.2	70	1.9	9	0.2
Mostly pipe/hookah	17	5.4	28	8.9	9	2.9	1	0.3
Ex-smoker	74	12.1	76	12.4	67	10.9	4	0.7
Never smoked	588	3.2	882	4.7	284	1.5	15	0.1
P-value	0.0001		0.0001		0.0001		0.0001	

Table 1 Bivariate analyses of diabetes, cardiovascular disease (CVD), and cancer according to selected variables (*concluded*)

Factor	Diabetes		Hypertension		CVD		Cancer	
	No.	%	No.	%	No.	%	No.	%
No. cigarettes/day (n = 130								
≤ 10	25	3.0	23	2.8	14	1.7	2	0.2
11–20	54	2.8	43	2.3	25	1.3	4	0.2
21–40	41	4.8	44	5.2	25	2.9	3	0.4
40+	10	6.3	9	5.7	6	3.8	0	0
P-value	0.01		0.001		0.008		0.824	
Marital status[e]								
Single	20	0.2	34	0.4	25	0.3	2	0.01
Engaged/married	624	5.5	784	7.0	299	2.7	22	0.2
Divorced/ widowed/separated	163	17.7	287	31.2	106	11.5	5	0.5
P-value	0.0001		0.0001		0.0001		0.0001	
Locality type								
Urban	472	2.6	654	3.5	243	1.3	22	0.1
Rural	210	2.3	291	3.2	140	1.5	3	0.01
Camp	135	2.4	163	2.9	66	1.2	9	0.2
P-value	0.351		0.035		0.182		0.034	
Age group (years)								
Young people (0–19)	12	0.1	5	0.01	23	0.1	6	0.01
Young adults (20–39)	47	0.5	77	0.8	31	0.3	3	0.01
Older adults(40–64)	510	11.4	633	14.1	204	4.5	16	0.4
Senior (65+)	248	20.9	393	33.1	191	16.1	9	0.8
P-value	0.0001		0.0001		0.0001		0.0001	
Type of health insurance								
Ministry of Health	322	2.9	402	3.7	184	1.7	12	0.1
Military	25	1.8	26	1.9	8	0.6	2	0.1
UNRWA	211	2.1	273	2.7	121	1.2	9	0.1
Social welfare/elderly	52	6.2	89	10.6	35	4.2	3	0.4
Israeli	72	3.7	97	5.0	24	1.2	4	0.2
Private/from abroad	14	2.4	15	2.6	8	1.4	1	0.2
None	120	1.6	204	2.7	67	0.9	3	0.01
P-value	0.0001		0.0001		0.0001		0.086	

[a] *Includes kindergarten through 5th grade; children under 5 years old not included.*
[b] *Includes 6th through 8th grade.*
[c] *A 2-year degree awarded after secondary school.*
[d] *Includes only those aged ≥ 10 years.*
[e] *Includes only those aged ≥ 12 years.*

[6]. It is also used as an escape from everyday life, a stress reliever. This may explain its surprisingly protective effect on hypertension, as those who smoke may use it as psychological escape from their troubles [6]. Few people see it as a risk factor owing to the number of older people who smoke. They do not realize that these long-time smokers have health problems.

Being an ex-smoker was associated with a higher prevalence for CVD. Ex-smokers may have had additional stress as a result of their quitting, and they may have begun eating as an outlet for their addiction. Being an ex-smoker was associated with a higher prevalence for CVD. Smoking cessation has been linked to an increase in obesity and diabetes, both of which are risk factors for CVD [7]. These findings could be the focus of a new study in the region dealing with the perceptions of smoking and its repercussions.

Being married has been shown to be a protective factor for cancer and CVD [8]. Considering that hypertension and diabetes are predisposing factors to CVD and some types of cancer, presumably, marriage would

Table 2 Logistic regression predictor model for region, refugee status, mid age groupings

Factor	Diabetes	Hypertension	CVD
	Adjusted for all variables OR (95% CI)	Adjusted for all variables OR (95% CI)	Adjusted for all variables OR (95% CI)
Region			
West Bank	1.000	1.000	1.000
Gaza Strip	0.785 (0.658–0.936)**	0.646 (0.548–0.762)****	0.522 (0.411–0.662)****
Sex			
Male	1.000	1.000	1.000
Female	–	1.585 (0.269–1.980)****	–
Refugee status			
Refugee	1.000	1.000	1.000
Non-refugee	0.658 (0.552–0.784)****	–	0.539 (0.428–0.677)****
Work status			
Unemployed	1.000	1.000	1.000
Employed	0.519 (0.418–0.646)****	0.548 (0.443–0.678)****	0.339 (0.247–0.465)****
Full-time student	–	0.100 (0.014–0.733)*	0.207 (0.074–0.583)**
Involved full time in household chores	0.782 (0.651–0.938)**	0.751 (0.606–0.930)**	0.630 (0.491–0810)****
Smoking status			
Never smoked	1.000	1.000	1.000
Mostly cigarettes	–	0.538 (0.428–0.676)****	–
Mostly pipe/hookah	–	1.571 (1.001–2.466)*	–
Ex-smoker	–		2.603 (1.920–3.529)****
Marital status			
Single	1.000	1.000	1.000
Married/engaged	2.918 (1.825–4.666)****	2.634 (1.800–3.854)****	–
Divorced/widowed/ separated	3.631 (2.195–6.008)****	3.735 (2.492–5.597)****	–
Locality type			
Urban	1.000	1.000	1.000
Rural	–	0.777 (0.657–0.920)**	–
Age group (years)			
Young people (0–19)	1.000	1.000	1.000
Young adult (20–39)	4.783 (2.269–10.083)****	14.511 (5.522–38.132)****	3.186 (1.810–5.608)****
Older adult (40–64)	89.878 (43.338–186.397)****	209.604 (80.631–544.878)****	35.655 (22.254–57.126)****
Senior (65+)	138.141 (65.978–289.231)****	433.597 (166.186–1131.302)****	95.047 (59.819–151,021)****
Type of health insurance			
None	1.000	1.000	1.000
Ministry of Health	1.563 (1.302–1.877)****	–	1.607 (1.277–2022)****
Social Welfare	1.708 (1.225–2.381)**	2.049 (1.546–2.716)****	1.958 (1.316–2.913)***
Israeli	1.819 (1.362–2.428)****	1.406 (1.087–1.818)**	–

**P < 0.05; **P < 0.01; ***P < 0.001; ****P < 0.0001.*
– = not statistically significant.
CVD = cardiovascular disease; OR = odds ratio; CI = confidence interval.

have similar protective effects against them. We found that people who were married/engaged were almost 3 times as likely and that people who were separated, divorced, or widowed were almost 4 times as likely to have diabetes and hypertension as single individuals The impact of marriage, divorce, and the lifestyles associated with them on chronic diseases is an area of study that requires more investigation and is out of scope for this paper.

We found that living in a rural environment was protective against hypertension. Living in a rural environment allows for an easier ability to grow food and cost of living is lower [9]. Meat is not the primary source of protein as it is expensive. These slightly better living conditions could be the reason for the protective effect.

Having any type of health insurance was associated with a higher prevalence of all diseases. However, it does not seem plausible that a person without health insurance would pay out of pocket on a consistent enough basis to be diagnosed with a chronic disease. Even if this were the case, it is a very difficult assumption to make for every person without health insurance, which would be necessary for this result to be accurate. The latter would also have to be true: those with insurance have to be getting consistent enough care to be diagnosed with a chronic disease. A questionnaire accompanied by medical tests would clear up many of these questions and should be the goal for future studies."

As would be expected, older people had higher disease prevalence than younger people for all 3 diseases. However, the degree to which being older was a risk factor was quite alarming, with those aged 40–65 years and over being anywhere from 36 to 434 times as likely as people aged 0–19 years to have diabetes, hypertension, or CVD. This, coupled with the fact that quality of health care has been decreasing since 2000 is very frightening for this age group [10].

A major strength of this study was that it compared Palestinians living in the Gaza Strip and the West Bank and identified the possible presence of health disparities between them. A limitation of the study was that it was limited to prevalence, as opposed to incidence data, which limited the ability to assess the risk of disease associated with potential risk factors. Another limitation was that disease data were obtained through self-reporting of medical diagnoses, which could have introduced reporting errors that might have biased the data. Despite the limitations, this study had a number of interesting results and can form the basis for future studies. In addition, it would be useful to include Palestinians living in Israel proper.

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WHO MPOWER tobacco control scores in the Eastern Mediterranean countries based on the 2011 report

Gh. Heydari,[1,2] F. Talischi,[2] H. Algouhmani,[3] H.A. Lando[4] and A. Ebn Ahmady[5]

الدرجات التي أحرزتها سياسة منظمة الصحة العالمية السداسية MPOWER في مكافحة التبغ في بلدان إقليم شرق المتوسط على أساس تقرير 2011

غلامرضا حيدري، فيروزة تليسجي، هاني الجوهماني، هري آ. لندو، آرزو ابن أحمدي

الخلاصة: كان الهدف من هذه الدراسة المستعرضة التعرف على درجة تنفيذ سياسات مكافحة التبغ السداسية في بلدان إقليم شرق المتوسط. وقد حصل الباحثون على المعلومات من تقرير منظمة الصحة العالمية حول السياسات الستة MPOWER عام 2011، فصمموا قائمة تفقُّدية حازت أحرازُها على موافقة الاختصاصيين الإيرانيين والدوليين في مكافحة التبغ. واشتملت القائمة على سبعة أسئلة تتراوح أحرازُها من 0-4، وثلاثة أسئلة تتراوح أحرازُها من 0-3. وتم توزيع البلدان وعددها 22 بلداً وفقاً للأحراز (درجات) الإجمالية التي أحرزتها ضمن مجال يتراوح من 0-37، وتبيَّن أن جمهورية إيران الإسلامية قد حققت أعلى الأحراز (29) إلى جانب مصر (28) والأردن (26). وأن اثني عشر بلداً (55٪) أحرزت أكثر من نصف الأحراز الممكنة (19)، وأن أخفض الأحراز في جميع البلدان كانت في المجالات التي تتعلق بحظر التبغ في الأماكن العامة (18)، وأن أعلاها في مجالات حظر الإعلان عن التبغ (66)، وأن أحراز الامتثال لسياسات التحرُّر من التبغ خاصة كانت منخفضة على وجه الإجمال. وتحظى برامج السياسات السداسية MPOWER بالقبول في الإقليم، إلا أن المطلوب تحقيق المزيد من التحسين والإسهام من قِبَل البلدان، على أساس النجاحات والتحديات في هذه البلدان، من أجل تعزيز تلك البرامج.

ABSTRACT The aim of this cross-sectional study was to quantify the implementation of MPOWER tobacco control policies among Eastern Mediterranean Region countries. Information was obtained from the 2011 WHO MPOWER report. A checklist was designed and its scoring was agreed by Iranian and international tobacco control specialists. Seven questions were scored from 0–4 and 3 from 0–3. The 22 countries were ranked by their total score on a scale of 0 to 37. The highest scores were achieved by the Islamic Republic of Iran, Egypt and Jordan 29, 28 and 26 respectively. Twelve of the countries (55%) scored more than half of the possible score (19). The lowest and highest scores for all countries summed were on sections related to banning smoking in public places (18) and tobacco advertising bans (66) respectively. Compliance with smoke-free policies was especially low. MPOWER programmes are accepted in the Region but there is considerable room for improvement. Input from countries based on their successes and challenges is needed to strengthen the programmes.

Scores MPOWER OMS pour la lutte antitabac dans les pays de la Méditerranée orientale issus du rapport 2011

RÉSUMÉ La présente étude transversale visait à évaluer la mise en œuvre des politiques de lutte antitabac MPOWER dans les pays de la Région de la Méditerranée orientale. Les informations ont été obtenues à partir du rapport MPOWER de 2011 de l'Organisation mondiale de la Santé. Une liste de vérification a été élaborée et sa notation a été décidée en accord avec des spécialistes de la lutte antitabac internationaux et iraniens. Sept questions ont été notées sur une échelle allant de 0 à 4 et trois questions sur une échelle de 0 à 3. Les 22 pays ont été classés en fonction de leur score total sur une échelle allant de 0 à 37. Les scores les plus élevés ont été obtenus par la République islamique d'Iran (29), l'Égypte (28) et la Jordanie (26). Douze pays (55 %) ont obtenu des scores supérieurs à la moitié du score maximal (19). Les scores les plus faibles et les plus élevés cumulés pour l'ensemble des pays concernaient l'interdiction de fumer dans les lieux publics (18) et l'interdiction de la publicité en faveur du tabac (66). Le respect des politiques d'interdiction du tabagisme était particulièrement faible. Le programme MPOWER est accepté dans la Région mais beaucoup d'améliorations peuvent encore être apportées. Il est souhaitable que les pays mettent en commun leurs succès et leurs difficultés en la matière pour renforcer les programmes.

[1]Tobacco Prevention and Control Research Center; [2]National Research Institute of Tuberculosis and Lung Diseases, Shahid Beheshti University of Medical Sciences, Tehran, Islamic Republic of Iran . [3]Framework Convention Alliance (FCA), Tehran, Islamic Republic of Iran. [4]Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, United States of America. [5]Community Oral Health Department, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Islamic Republic of Iran (Correspondence to A. Ebn Ahmady: a.ebnahmady@sbmu.ac.ir; aebnahmady@yahoo.com).

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Introduction

There is ample and indisputable evidence of the dangers of tobacco smoking [1–10]. Tobacco use kills half of those who smoke [2] and it decreases life expectancy on average by 15 years [2–4]. Worldwide 5 million people currently die from tobacco every year [1]. Without effective tobacco control measures, it is estimated that by the year 2030 the annual global death toll will reach 8 million [1,5]. In the absence of effective tobacco control measures, consumption is likely to increase in many countries [11]. Indeed, developing countries are facing an increased prevalence of tobacco consumption, but unlike developed countries have not yet faced the full burden of resulting illness and morbidity [5,7]. In our Region, according to the latest data, smoking prevalence is still increasing or has plateaued [8].

To counter the global tobacco epidemic, the World Health Organization (WHO) developed the WHO Framework Convention on Tobacco Control (WHO FCTC) to provide new legal dimensions for international health cooperation. As of 12 February 2012 the treaty has been ratified by 174 parties who wish to decrease the supply and demand of tobacco [12]. In this regard, WHO introduced a package of measures under the acronym of MPOWER with the aim of reducing tobacco consumption and prevalence [13]. This package focuses on 6 proven policies for tobacco control to reduce consumption which include: monitoring tobacco use and prevention policies, protecting people from tobacco smoke, offering help to quit tobacco use, warning about the dangers of tobacco, enforcing bans on tobacco advertising, promotion and sponsorship, and raising taxes on tobacco.

Several scoring systems have been developed in different countries to evaluate anti-tobacco activities and their implementation. Gilpin and colleagues developed an index for the United States (US) state tobacco control outcomes based on cigarette prices and workplace and home smoking bans [14]. Chriqui and colleagues [15] applied a rating system to state indoor air laws in the US, and the American Lung Association measures tobacco control activities at the state level based on spending, smoke-free air laws, cigarette excise tax and youth access laws [16]. Jossens and Raw developed a tobacco control scale according to a World Bank list of effective tobacco control interventions and applied it to 30 European countries [17]. Their initial results showed countries ranked by their score and discussed the merits and limitations of the scale.

No such study has been done in the Eastern Mediterranean Region. Thus the aim of our study was to compare MPOWER Programnes among the countries of the WHO Eastern Mediterranean Region to highlight what has been achieved and what still needs to be addressed by the countries to strengthen these programmes.

Methods

This was a cross-sectional study with collection of information from the WHO programme of tobacco prevention in the EMR countries found on pages 1–140, 9–128, 7–116, 3–102 from the MPOWER 2011 report [18].

A checklist of indicators was initially designed by Iranian and international tobacco control specialists and its cut-offs were set according to the scoring key sections of the MPOWER 2011 report. In order to score the checklist and create the scale, we convened a panel of experts [including 3 tobacco control experts, 1 public health specialists and 1 epidemiologist from the Tobacco Prevention and Control Research Center, National Research Institute of Tuberculosis and Lung Disease (NRITLD), Tehran] to determine the allocation of points to the scale. Thus, 7 questions were scored from 0–4 and 3 from 0–3, giving a maximum possible score of 37.

Five raters (medical doctors from the Tobacco Prevention and Control Research Center, NRITLD) were selected by the principle investigators. They went through a lengthy training process conducted by 1 experienced tobacco control expert (Head, Tobacco Prevention and Control Research Center) and 1 experienced rater (medical doctor from the Tobacco Prevention and Control Research Center). The training involved reading about the tobacco control policies that were the focus of the study and the scoring section of the MPOWER 2011 report. After the training and considered ready by the project coordinator, the raters carried out the subject review and their first scoring report was observed by the experienced rater. The reports were observed again by the project coordinator, who selected 2 final raters and determined when they were ready to work alone.

In order to achieve and maintain calibration between the 2 raters, the project coordinator gave them with 1 subject to report independently. Statistical analysis of the reliability of their ratings was used to maintain acceptable levels of reliability for the study. A correlation coefficient of 0.80 was calculated between these 2 raters. Data entry was done independently by the first selected rater and was checked by the second. At least 2 of these reports were selected randomly and observed in order to monitor their rating against those made by the original coordinator, the tobacco control expert and the experienced rater.

The scores were summed and the rankings were computed. The checklist, with its scoring and scale, is shown in Table 1.

Results

We uncovered large differences in scores across EMR countries. The results are shown in Table 2. Countries are ranked

Table 1 WHO MPOWER score on tobacco control in Eastern Mediterranean countries based on WHO 2011 report

Indicator	Point scoring
Adult daily smoking prevalence	(4)
Estimates not available	0
≥ 30% or more	1
20%–29%	2
15%–19%	3
< 15%	4
Monitoring: prevalence data	(3)
No known data or no recent data or data that is neither recent nor representative	0
Recent and representative data for either adults or youth	1
Recent and representative data for both adults and youth	2
Recent, representative and periodic data for both adults and youth	3
Smoke-free policies	(4)
Data not reported	0
Up to 2 public places completely smoke-free	1
3-5 public places completely smoke-free	2
6–7 public places completely smoke-free	3
All public places completely smoke-free	4
Cessation programmes	(4)
Data not reported	0
None	1
NRT and/or some cessation services (neither cost-covered)	2
NRT and/or some cessation services (at least 1 cost-covered)	3
National quit line, and both NRT and some cessation services cost-covered	4
Health warning on cigarette packages	(4)
Data not reported	0
No warnings or small warnings	1
Medium-sized warnings missing some appropriate characteristics	2
Medium-sized warnings with all appropriate characteristics	3
Large warnings with all appropriate characteristics	4
Anti-tobacco mass media campaigns	(4)
Data not reported	0
No campaign conducted between January 2009 and August 2010	1
Campaign conducted with 1–4 appropriate characteristics	2
Campaign conducted with 5–6 appropriate characteristics	3
Campaign conducted with all appropriate characteristics	4
Advertising bans	(4)
Data not reported	0
Complete absence of ban in print media	1
Ban on national television, radio and print media only	2
Ban on national and some international television, radio and print media	3
Ban on all forms of direct and indirect advertising	4
Taxation	(4)
Data not reported	0
≤ 25% of retail price is tax	1
26%–50% of retail price is tax	2
51%–75% of retail price is tax	3
75% of retail price is tax	4
Compliance with bans on advertising	(3)
Complete compliance (8/10 to 10/10)	3
Moderate compliance (3/10 to 7/10)	2
Minimal compliance (0/10 to 2/10)	1
Not reported	0
Compliance with smoke-free policy	(3)
Complete compliance (8/10 to 10/10)	3
Moderate compliance (3/10 to 7/10)	2
Minimal compliance (0/10 to 2/10)	1
Not reported	0
Total score	37

Table 2 Eastern Mediterranean Region countries ranked by total WHO MPOWER score on tobacco control in 2011

Country	Smoking prevalence	Monitoring	Smoke-free policies	Smoke-free policy compliance	Cessation programmes	Health warning on cigarette packages	Mass media campaigns	Advertising bans	Advertising ban compliance	Taxation	Total No. (%)
Iran (IR)	4	3	4	2	4	4	0	4	3	1	29 (78)
Egypt	3	2	3	1	3	4	4	3	2	3	28 (75)
Jordan	2	3	2	2	3	2	3	4	2	3	26 (70)
UAE	4	1	2	2	4	1	2	4	2	2	24 (64)
Bahrain	3	1	1	0	4	1	3	3	3	2	21 (56)
Kuwait	3	2	1	0	3	1	3	4	2	2	21 (56)
Libya	2	2	4	2	2	1	1	3	3	1	21 (56)
Pakistan	3	0	4	1	2	3	1	1	2	3	20 (54)
Gaza & West Bank	0	0	3	3	2	1	1	3	3	4	20 (54)
Djibouti	0	3	3	0	2	4	1	4	0	2	19 (51)
Saudi Arabia	4	2	1	0	4	1	2	3	0	2	19 (51)
Sudan	4	1	1	0	1	1	2	4	2	3	19 (51)
Morocco	3	3	2	0	2	1	4	3	0	0	18 (48)
Syrian Arab Republic	0	1	3	2	3	1	0	4	2	2	18 (48)
Lebanon	1	3	2	1	2	1	4	1	0	2	17 (45)
Qatar	0	2	1	0	3	1	1	4	3	2	17 (45)
Tunisia	1	2	1	0	2	1	2	3	2	3	17 (45)
Yemen	2	1	1	0	1	2	2	3	2	3	17 (45)
Iraq	3	1	1	0	2	1	1	3	2	1	15 (40)
Oman	4	2	1	0	2	1	1	1	0	2	14 (37)
Afghanistan	0	0	2	0	2	1	0	3	0	1	9 (24)
Somalia	0	0	1	2	1	1	0	1	0	1	7 (18)
Total	44	35	44	18	54	35	38	66	34	43	

IR = Islamic Republic; UAE = United Arab Emirates.

by total score, and the score obtained for each indictor for each activity. The highest total scores were achieved by the Islamic Republic of Iran, Egypt and Jordan (29, 28, 26 respectively). Twelve countries (55%) achieved more than half of the maximum score (19). Despite its overall high score, the Islamic Republic of Iran did not score well on mass media campaigns and tobacco taxation. The Syrian Arab Republic, Afghanistan and Somali scored the lowest on mass media campaigns with no campaigns conducted between January 2009 and August 2010, while Morocco, Egypt and Lebanon scored highest. More than 50% of the countries (12) did not report on compliance on smoke-free policy; whereas Gaza reported complete compliance with smoke-free policy. All 22 countries reported having at least minimal restrictions on advertising. There was a considerable range of scores on most questions. The indictor with the lowest combined score for all countries was compliance with smoke-free policy (18) while the indicator with the highest combined score for all countries was tobacco advertising bans (66). Only 12 countries scored above 50%, and the countries could be roughly divided into 3 groups: those with ≥ 70 (3 countries), those with 37–64 (16 countries) and those with ≤ 24 (3 countries).

Discussion

This paper reports on the differences in implementing of 6 tobacco control policies in EMR countries based on the MPOWER 2011 report. It is the first study from MPOWER in the Region so there are no published comparison data for the Region. However, Heydari and colleagues [19] examined tobacco control scales in 2009 that showed a general view for tobacco control programme in countries which had the same finding.

It is noted that many countries scored the same and there was little difference in scores for several countries. For example, Bahrain, Kuwait and Lebanon scored 21, Pakistan and Gaza 20 and Djibouti, Serbia and Sudan scored 19.

In the studies of Gilpin and colleagues [14] and Chriqui and colleagues [15] their scoring systems compared tobacco control policies within the same legal system, so measurement of enforcement and comparisons were easier. In a study by Joossens and Raw [17], which used a different but similar methodology to our study, it was shown that only 50% of European countries scored more than 50%, which is similar to what we found for the EMR countries (55% or 12 countries scored higher than 50%). Yet, in the previous study, only 14% or 3 countries achieved this score [19]. It can be concluded that these countries (Islamic Republic of Iran, Jordan and Egypt) are more active in tobacco control programmes, but that there is still room for improvement.

The results of this study show that the Islamic Republic of Iran, despite ranking first, had low scores on mass media campaigning and taxation. This information can be helpful for health officials who might want to strengthen the tobacco control programmes in illustrating the measures that could be targeted. Similar suggestions for improvement can be made in other countries based on the results of this study.

Egypt, Jordan, Pakistan, Sudan and Yemen scored well in taxation and increased cigarette prices. West Bank and the Gaza scored the highest in these policies.

Our study found that many countries either have not banned smoking in public places or are weak in this regard (12 countries scored 0 and 3 countries scored 1 out of a total of 3). The average country score for this indicator was 18, which was the lowest for the categories assessed. On the other hand, bans on tobacco advertisements had a combined score of 66 and was the most popular legal effort undertaken.

The current data were gathered from the 2011 MPOWER report. We acknowledge that the developed scale depends critically on these data and this is the first time such a scale has been applied to EMR countries. As these data were collected from the WHO report and were clear and easy to understand, we see no serious limitation to the applicability of this scale.

In conclusion, tobacco control measures according to MPOWER are generally well accepted, permit comparisons across EMR countries and provide preliminary results using a systematic scoring system. The current findings indicate that although progress has been made, there is significant room for improvement and regional countries should take steps to build on their successes and should continue to work on strengthening their weak points.

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Note from the Tobacco Free Initiative programme

This article is based on the information in the *WHO report on the global tobacco epidemic, 2011*, which is also founded on legislations issued in 2010. Since then, many legislations have been adopted at the national level, which makes the profile of tobacco control measures different from that reflected in the article. However, the article may serve well as a baseline for data of 2011. In addition, due to new evidence on second-hand smoke mortality, the total global deaths attributed to tobacco use are now reaching 6 million, which is significantly different from the number included in the article which is based on old estimates.

Geographic epidemiology in a small area: cancer incidence in Baakline, Lebanon, 2000–2008

S.M. Adib,[1] N. Tabbal,[2] R. Hamadeh[3] and W. Ammar[4]

الوبائيات الجغرافية في منطقة صغيرة: معدل حدوث السرطان في بعقلين، لبنان: 2000–2008

سليم أديب، نبيل طبال، راندة حمادة، وليد عمار

الخلاصة: لا تتيح البيانات المتراكمة التي يقدّمها السجل الوطني للسرطان في لبنان تمييز معدلات حدوث السرطان في المناطق الصغيرة. وقد أجرى أعضاء مدربون في المجتمع مسوحات للسكان الدائمين في بلدية بعقلين باستخدام أسلوب التشريح اللفظي. وشمل المسح 1042 من المنازل التي كان فيها أحد السكان على الأقل يعيش في بعقلين بشكل دائم في الفترة 2000–2008، وهكذا فقد غطّت البيانات 4330 شخصاً بما يعادل 34143 سنة من الملاحظة. وخلال فترة الملاحظة أبلغ عن 56 حالة سرطانية جديدة، وكان وسطي العمر وقت الإبلاغ يتفاوت تفاوتاً يُعْتَدُّ به إحصائياً بين الرجال (77 عاماً) والنساء (56 عاماً). وكان أكثر أنماط السرطان شيوعاً سرطان الرئة (20٪)، يتلوه سرطان القولون والمستقيم (12.5٪) وسرطان الثدي (9٪). وكان المعدل الخام التقديري لحدوث السرطان 164 حالة لكل مئة ألف شخص/ عام؛ وهو أعلى بمقدار يُعْتَدُّ به إحصائياً لدى الرجال (194) مما هو عليه لدى النساء (130)، وأقل بكثير من مجمل الرقم الوطني (218). وكان السكان الدائمون في بعقلين أطول عمراً من أعمار مجمل اللبنانيين، إلا أن معدل حدوث السرطان أقل بشكل واضح من الرقم الوطني. وتلفت هذه النتائج النظر إلى أهمية الحِفَاظ المتواصل على التلوث البيئي المنخفض، وإلى أهمية أنماط الحياة الصحية في الغذاء، والامتناع عن التدخين في وقاية السكان من السرطان حتى الآن.

ABSTRACT Aggregate data of the National Cancer Registry in Lebanon cannot discriminate cancer incidence in small areas. Trained community members surveyed the permanent population of the Baakline municipality using the verbal autopsy approach. We surveyed 1042 households with at least 1 member living permanently in Baakline during 2000–2008. Data covered 4330 persons yielding 34 143 years of observation and 56 new cases of cancer were reported. Median age at diagnosis varied significantly between men (77 years) and women (56 years). The most common types were lung cancer (20%) followed by colorectal (12.5%) and breast (9%). Estimated crude cancer incidence rate was 164 cases/100 000 persons/year, significantly higher in men (194) than women (130), and much lower overall than the national figure (218). The permanent Baakline population is older than that of Lebanon itself, yet the cancer incidence rate is markedly lower than the national figure. This finding pleads for serious efforts to preserve the low environmental contamination and the healthy lifestyles in food and tobacco abstinence that have protected the population so far.

Épidémiologie géographique dans une petite zone : incidence du cancer à Baakline (Liban) entre 2000 et 2008

RÉSUMÉ Les données globales du registre national du cancer au Liban ne permettent pas de distinguer l'incidence du cancer dans des petites zones. Des membres de la communauté formés ont interrogé la population permanente de la municipalité de Baakline à l'aide de la méthode de l'autopsie verbale. Nous avons enquêté auprès de 1042 ménages au sein desquels au moins un membre a habité de manière permanente à Baakline entre 2000 et 2008. Les données concernaient 4 330 personnes, pouvant représenter 34 143 années d'observation. Pendant les neuf années de la période d'observation, 56 nouveaux cas de cancer ont été rapportés. L'âge médian au moment du diagnostic variait significativement entre hommes (77 ans) et femmes (56 ans). Les types de cancer les plus courants étaient le cancer du poumon (20 %), le cancer colorectal (12,5 %) et le cancer du sein (9 %). Le taux brut estimé de l'incidence du cancer était de 164 cas/100 000 personnes/an ; il était nettement plus élevé chez les hommes (194) que chez les femmes (130), et globalement bien plus faible que le taux national (218). La population permanente de Baakline est plus âgée que celle du Liban, cependant l'incidence du cancer est très inférieure au chiffre national. Ce résultat appelle d'importants efforts pour préserver le faible degré de contamination de l'environnement et les modes de vie sains, notamment pour ce qui est de l'alimentation et de l'abstinence tabagique, qui ont protégé la population jusqu'à aujourd'hui.

[1]Department of Epidemiology and Public Health, Faculty of Medicine, Saint-Joseph University, Beirut, Lebanon (Correspondence to S.M. Adib: salimadib@hotmail.com). [2]INSERM U897, ISPED, Université Victor Segalen, Bordeaux, France. [3]Primary Healthcare Department; [4]Ministry of Public Health, Beirut, Lebanon.

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Introduction

Systematic epidemiological data concerning cancer in Lebanon have become available on a regular basis only recently through the National Cancer Registry [1]. Most recently the incidence of cancer was estimated at about 180 cases per 100 000 population per year (2008), for a total annual caseload approximating 8000 new cases (unpublished data, Ministry of Health, 2008). Because of the relatively small number of new cases occurring annually in Lebanon, aggregate data of the National Cancer Registry cannot discriminate cancer incidence accurately even at the *mohafazat* (governorate) level. In particular, the way data are collected cannot respond to the needs of the population in specific areas of Lebanon to know more about trends in cancer incidence particular to their area.

Traditions in Lebanon still require that a deceased person should be buried in his/her original city, regardless of the place where death occurred. A person whose roots are in Baakline is highly likely to be buried there, even if the death occurred elsewhere in Lebanon or even abroad. When the body of a person who died abroad is not repatriated, the passing will be marked by the extended family in some form of social ceremony. As cancer incidence increases in Lebanon and worldwide, grieving ceremonies for persons dying from cancer will also increase. In a small community such as Baakline, this increase in cancer-associated deaths can become rapidly perceptible, notwithstanding the place of residence of the deceased person at time of diagnosis. In addition, a diagnosis of cancer is more frequent than in the past, and the stigma against disclosing it is eroding. All these factors may give the impression that cancer is becoming a much more serious problem than elsewhere. This impression can only be validated using quantitative methods, such as the measure of the actual cancer incidence in Baakline.

The Lebanese population is recorded in vital statistics not by place of residence but rather by place of family origin. A person recorded in Baakline may have been born outside the city, lived all their life elsewhere, and never even seen it in their entire lifetime. In reality, even among those born in Baakline, internal migration or expatriation will result in a large proportion, if not the majority, living most of their lives outside the city. Therefore, records in Baakline (and any other small town or village in rural Lebanon) will forever suggest a larger demographic dimension than in reality. When a person dies, they will be ultimately recorded as dead in Baakline, regardless of the place mentioned on the death certificate. These factors make it difficult to decide on the denominators to be used for the estimation of cancer incidence in a specific area, and on which cases should actually be included in the numerator. Hence, measuring local cancer dynamics can best be done when the confines of a stable, clearly defined population are defined first.

Other arguments plead in favour of a down-up approach from population to disease. Cancer is associated with endogamy, cultural lifestyle norms (food, drinks, tobacco use, etc.) and common environmental exposures [2]. Changes in those variables, which happen when people leave their original community, will lead to changes in cancer risks. Consequently, cancer incidence in Baakline or elsewhere can be assessed in a valid way only among those living there long enough to be exposed to a potential risk on a long-term basis, and to allow for that exposure to progress to pathology.

In 2009, a request was filed by the population of Baakline and surrounding areas, in the mountain *caza* (district) of Chouf (Central Lebanon) with the local Member of Parliament to provide evidence for or against a perceived increase in cancer incidence. This study responds to that community request. Baakline is a mid-sized, semi-rural, mountain town (altitude 900 m) 45 km south-east of Beirut. It has about 2800 households with a relatively affluent population of about 17 000, but the proportion of those who are actual year-long permanent residents is unknown.

The objectives of the field investigation reported here were: to establish a yearly denominator of permanent residents of the Baakline area for 2000–2008; to count all cases of death in each of those years, for all reasons, for all cancers, and for each type of cancer; to compute age-adjusted mortality and cancer-specific mortality rates in the Baakline area, and to compare those with national figures.

Methods

We carried out a door-to-door survey using the verbal autopsy method to measure the cancer incidence in Baakline between 2000 and 2008. All households with permanent residents existing within the confines of the municipality of Baakline were assessed. For the purposes of this survey, a permanent resident of Baakline was defined as a person who had no other permanent residence outside those confines before 2009.

The project was presented to the population in a town meeting and vetted by the "neighbourhood committees" representing families in each sector of Baakline. A data checklist was established to be completed in face-to-face interviews. This included household variables, information on cancer cases, and some selected environmental factors whose potential association was deemed of interest to the community. We trained 25 women from the neighbourhood committee (a women's association) on the interview checklist during 2 special sessions. This prepared then in a standardized way to deal with all possible situations that might arise when conducting the

interviews. Following training, the surveyors started canvassing their respective neighbourhoods door-to-door to further explain the aim of the survey to the community and to obtain voluntary participation. In each household, 1 respondent was requested to provide accurate information on permanent household members who were still alive and also those who had died between 2000 and 2008. The entire encounter did not last more than 20 minutes.

When reluctance to share information was perceived in a household, a female committee member from another neighbourhood was brought into the process, and this simple step most often resulted in agreement to participate.

The process was confidential but not anonymous. Activities were supervised by a senior staff member located at the Municipality, who was in charge of trouble-shooting and had easy access to the research team in Beirut. Names and telephone numbers were obtained for validity and accuracy checks, which were conducted by the supervisor on questionnaires with missing, unclear or inadequate responses.

The age-sex composition of the permanent population, alive and dead between 2000 and 2008 was analysed. The cancer incidence rate was calculated using a denominator of person-years, and presented as incidence rate per 100 000 persons per year.

Demographic, clinical and environmental characteristics of cancer cases/households identified in the survey were presented as mean with standard deviation (SD) and median or frequencies and percentages, depending on the variable involved. Differences were tested using adequate procedures and significance was established at $P \leq 0.05$.

Results

Description of the participating population

The surveyors identified 1042 households with at least 1 member living permanently in Baakline during the period of the survey (October 2009–March 2010). This represents about 1/3 of all households in Baakline. A few households refused initially to allow the survey team access, however, informal contacts and further clarification of the aims of the research resulted in a reversal of the refusal.

The family size per household was on average 4.8 (SD 1.8; median 5) persons. Only 5.5% of households included only 1 person and about 3% included ≥ 8 members (Figure 1).

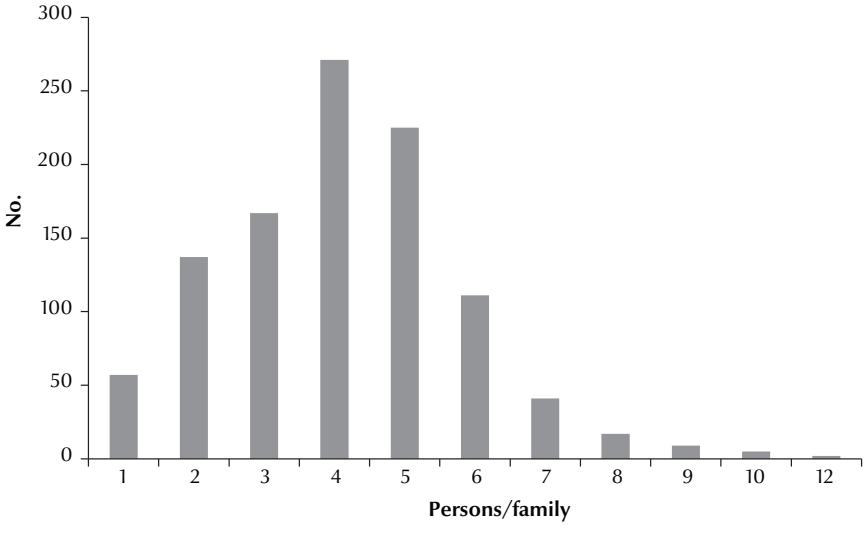

Figure 1 Distribution of family size in the permanent population (*n* = 4337) of Baakline, Lebanon, 2000–2008

The total number of individuals who were permanent residents at any time between 2000 and 2008 was 4330 persons. We found 47.8% were ≥ 40, (mean 39.8, SD 22.7) years. Compared to the general Lebanese population, the population surveyed in Baakline was older (median 29.8 years nationally versus 38.0 in Baakline) (Table 1) [2]. It included a lower proportion of women (46.4%) compared to national figures (49.7%) [3]. There were no meaningful differences in mean age between men and women. The survey population contributed a total 34 143 person-years of observation.

There were a number of reasons why a full 9-year observation period could not be obtained for 672 individuals; these included: travelling away from Lebanon (40%), moving away from Baakline (36%), death (23%) or birth (1%).

The crude death rate from all causes was 4.6 per 1000 per year; the crude birth rate was 0.2 per 1000 per year. Details on the age-sex distribution of the survey population compared to the general Lebanese population at mid-interval (CAS 2004) are shown in Table 1.

Cancer experience in Baakline

During the 9-year observation period, 56 new cases of cancer were reported; 62.5% were in men (versus 50% nationally) [1]. In 5 cases, the respondents were unable to clearly state the cancer sites, and another member of the family more acquainted with the details of that case was consulted. The mean age at diagnosis was 66.6 (SD 18.8; median 71.5) years. The median age at diagnosis varied significantly between men (77 years) and women (56 years) ($P < 0.01$). The most common sites were lung (20%) followed by colorectum (12.5%) and breast (9%). Case-fatality was 57%, greater in men (63%) than in women

Table 1 Age and sex distribution of the permanent population of Baakline, Lebanon, 2000–2008

Age (years)	Males		Females		Total	
	No.	%	No.	%	No.	%
0–14	318	13.7	284	14.1	602	13.9
15–34	689	29.7	665	33.1	1354	31.3
35–64	915	39.4	747	37.2	1662	38.4
> 65	399	17.2	313	15.6	712	16.4
Total	2321	100.0	2009	100.0	4330	100.0
Mean (SD)	40.5 (22.7)		39.0 (22.5)		39.8 (22.7)	
Median[a]	39.0		36.0		38.0	

[a]*In comparison, median age in Lebanon is: males 28.7 years, females 31.0 years, total 29.8 years [3].*
SD = standard deviation.

(52%) (Table 2). The cancer-specific death rate was 1.3 per 1000 per year (*n*= 46). Figure 2 presents the relative distribution of cancer diagnosis by year which shows random patterns with no clear trends over time, suggesting an average of 6–7 new cases to be expected per year, in the absence of major shifts in the composition and exposures of the population.

Based on figures observed, a crude cancer incidence rate of 164 new cases per 100,000 persons per year could be estimated for the total population; significantly higher in men (194) than women (130). Overall cancer incidence unadjusted for age was lower in Baakline compared to the national figure (218 cases per 1000 in 2004). Adjusting for age would have brought the Baakline figures even lower, since its population was older than the national mean age, and was therefore judged to be of no added value to the study. The crude cancer incidence rate was higher than the national figure for men but for women it was lower (Table 3).

Environmental factors

Tables 4 and 5 provide details on several environmental factors such as sources of water used in the household and the indoor environment. Microwaves which may be sources of potentially dangerous radiations were present in 45% of households. Most households were free of any indoor smoke, either from cigarettes or *narghileh* (shisha). In

Table 2 Demographic and prognostic characteristics of cancer cases in Baakline 2000–2008 (*n* = 56)

Variable	No.	%
Sex		
Male	35	62.5
Female	21	37.5
Age (years)		
0–14	0	0.0
15–34	5	8.9
34–64	17	30.4
>64	34	60.7
Location of cancer		
Lung	11	19.6
Colon	7	12.5
Breast	5	8.9
Blood (leukaemia)	4	7.1
Liver	4	7.1
Stomach	4	7.1
Uterus	4	7.1
Kidney	3	5.4
Blood (lymphoma)	3	5.4
Prostate	2	3.6
Larynx	2	3.6
Bone	2	3.6
Bladder	1	1.8
Eye	1	1.8
Soft tissue	1	1.8
Prognosis by 2009		
Death from cancer	32	57.1
Death from other cause	1	1.8
Alive	23	41.1
Mean age at diagnosis	**Mean (SD) median**	
Men	70.6 (17.7) 77.0	
Women	57.1 (17.9) 56.0	
All	66.6 (18.8) 71.5	

SD=Standard deviation.

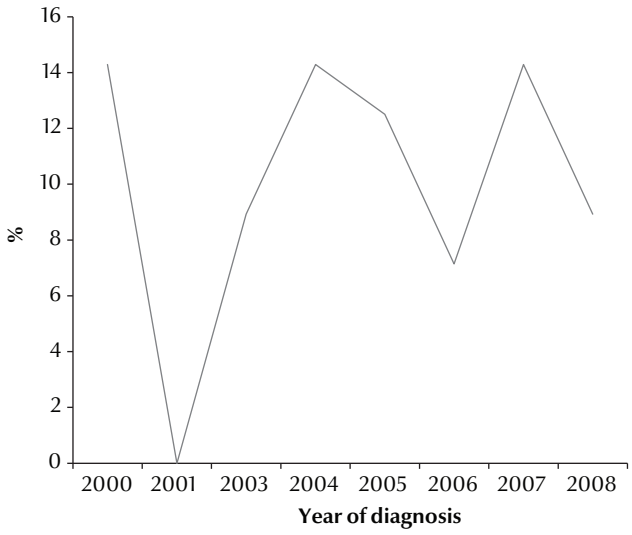

Figure 2 Relative frequency of incident cancer cases in Baakline, Lebanon, 2000–2008 (*n* = 56)

almost all those which had smokers, the number rarely surpassed 1 per household. Few households were in direct proximity to agricultural land using pesticides (7.4%) or to electromagnetic fields generated by high-voltage electric power lines (2.7%). Comparison of households with and without cancers did not show any significant differences for any of these selected environmental factors.

Discussion

From the outset, the characteristics of the permanent population of Baakline which would be included in this door-to-door survey were particular. Compared to the Lebanese population, it was significantly older (2011 estimates) [3]. The proportion of those aged 60 and more was 22%, compared to 10% in the overall population [4]. This clearly reflects the depletion of the rural population through migration, which leaves older persons behind. Another finding emerged also from the survey: the proportion of elderly men was unexpectedly higher than that of elderly women. This unusual situation very likely reflects the social reluctance of children to leave an elderly mother, more than an elderly father, alone in the mountains as they move away, and the higher probability that elderly men more than elderly women would resist moving away, even when left alone in the house.

In the permanent population of Baakline, the incidence of cancer, unadjusted for age, was lower than the national rate (Table 3) [1] (adjustment was deemed irrelevant to the purpose of this study, since the population of Baakline is older than the population of Lebanon as a whole, and adjustment would therefore have increased the gap in rates). The difference was most marked in women, where incidence in Baakline was almost half the national rate. Another epidemiological difference was for age at diagnosis, favouring Baakline's men (median age 77 years) compared to men in Lebanon as a whole (median age 63 years) [3]. There were no differences in this regard in women (median age 56 years).

The favourable findings for cancer in Baakline may be largely attributable to the healthy environment, as indicated some selected variables measured in this survey. Arguably, factors directly associated with lifestyle would also contribute to this finding. Those factors were not included in this survey because they cannot be validly measured for several persons over a 9-year period using 1 interview with 1 proxy respondent.

Although no other studies have been done in this area and no data are available, empirical observation and informal exchanges with community members largely suggest that lifestyles remain for the most part traditional and healthy. The protective effects of the mountain environment and/or lifestyle are further confirmed in the interpretation of epidemiological differences. When the risk factors are intrinsic, cancer occurs at the same age as in the rest of the population. The most common cancer in women, breast cancer, is caused by reproductive factors, and therefore occurs at the same age everywhere. Patterns of reproductive life are believed to remain traditional in Baakline (early age at marriage, larger families, longer breast-feeding periods, etc.) and may lead to a lower incidence of risk factors, and therefore lower incidence rates. These patterns will change inevitably with younger women, and therefore cancer in women may increase in the coming years, thus indicating the importance of awareness regarding early breast cancer detection as years pass by.

Table 3 Unadjusted cancer incidence rates (per 100 000 population) in the Baakline population (2000–2008) and in the Lebanese population

Sex	Baakline	Lebanon[a]
Male	194	157
Female	130	224
All	164	218

[a] *National Cancer Registry, 2004 [1].*

Table 4 Water sources for households (*n* = 1042) of the permanent population of Baakline, Lebanon, 2000–2008

Water source	Never		Sometimes		Always	
	No.	%	No.	%	No.	%
Drinking water						
Private well	606	89.4	5	0.7	67	9.9
Sterilized bottles	318	37.8	207	24.6	317	37.6
Tanker	588	87.4	68	10.1	17	2.5
Tap water	200	22.3	49	5.5	649	72.3
Spring	440	59.1	89	11.9	216	29.0
Rainwater reservoir	645	96.0	6	0.9	21	3.1
Cooking water						
Private well	594	89.3	18	2.7	53	8.0
Sterilized bottles	540	79.5	71	10.4	69	10.1
Tanker	562	86.1	75	11.5	16	2.4
Tap water	83	8.9	29	3.1	823	88.0
Spring	504	67.2	53	7.1	193	25.7
Rainwater reservoir	627	95.7	7	1.1	21	3.2
Service water						
Private well	593	85.2	22	3.2	81	11.6
Sterilized bottles	628	94.3	13	2.0	25	3.8
Tanker	566	77.7	16	2.2	146	20.1
Tap water	59	6.5	17	1.9	829	91.6
Spring	565	77.5	16	2.2	148	20.3
Rainwater reservoir	619	94.5	8	1.2	28	4.3

Men also display a significant resistance to cancer, which occurs in Baakline almost 15 years later than elsewhere in most cases. For men in general, the most common cancers were of the lung and colon, both widely associated with lifestyle, e.g. smoking and a diet low in fibre and rich in animal fats [2]. The behavioural risk factors we assessed are probably less prominent in Baakline, which may explain the delay in cancer incidence compared to elsewhere. However, the frequent finding of behaviourally-associated cancers among older men suggests that they may be a special risk group in the population, whose social environment should be investigated and improved, if possible.

There are very few studies specifically assessing differences in cancer incidence in mountainous and non-mountainous areas. A study from Kyrgyzstan found a lower incidence of oesophageal, pulmonary and breast cancers in ethnic groups historically living in mountainous areas [5]. The difference was attributed to the adaptation of those groups to mountain hypoxia, which may "function like a brake for the development of cancer tumours". However, this study did not consider an alternative/contributing attribution to lifestyles between the traditional ethic groups in the mountains (mostly Kyrgyzs) compared to "newcomers" (Kazakhs and Russians).

A certain level of interaction seems to exist between environmental and lifestyles factors associated with health outcomes. There are numerous ways through which the environment can interact with other factors to create situations with varying effects on health. A cohort study in Japan found that vegetable dishes high in salt specific to mountain areas may cause a more severe form of stomach cancer [6]. In China, the northern mountains are areas of "undeveloped living conditions" with higher prevalence of *H. pylori* infection, leading to increased rates of upper gastro-intestinal cancer with rising altitudes [7].

Table 5 Sources of environmental pollution of households (*n* = 1042) of the permanent population of Baakline, Lebanon, 2000–2008

Source	No.	%
Indoor environment		
Microwave ownership	469	45.1
No cigarette smokers in the house	605	58.5
No *narghileh* users in the house	819	79.1
Outdoor environment		
Proximity of agricultural land	76	7.4
Proximity of high-voltage power lines	18	2.7

Conclusions

This is the first assessment of cancer epidemiology ever conducted in a geographically/demographically specific area in Lebanon. Although the Baakline population is older than that of Lebanon as a whole, the cancer incidence rate is remarkably lower than the national figure. Further research may look at specific protective factors which make this population less vulnerable to cancer even as it grows older.

Our findings are an indication that serious efforts should be made to maintain the low contamination of the town's

environment, and the healthy lifestyles which have served the population so well up till this survey. The decreasing fraction of Lebanese who maintain their permanent residence in traditional pristine mountainous areas such as Baakline should be encouraged by the evidence we present to know that they are less prone to cancer than the rest of the population.

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Antenatal depression and its predictors in Lahore, Pakistan

A. Humayun,[1] I.I. Haider,[2] N. Imran,[3] H. Iqbal[4] and N. Humayun[5]

الاكتئاب السابق للولادة ونوابِئُه في لاهور، باكستان

عائشة همايون، عمران إعجاز حيدر، نازيش عمران، حُمَيْرا إقبال، ناهيد همايون

الخلاصة: إن الصحة النفسية عنصر هام من عناصر الصحة الإنجابية ولكنه مهمل. وقد هَدَفَتْ هذه الدراسة إلى التعرف على معدلات انتشار وعوامل اختطار الاكتئاب السابق للولادة لدى الحوامل اللاتي يراجعن الرعاية السابقة الولادة في إحدى مستشفيات الرعاية الـحَضَرية الثالثية في لاهور، باكستان. وهي دراسة مستعرضة، استندت إلى استمارة مُنَسَّقة تَمَّت تَمْلِئَتُها ومن ثَمَّ تحري الاكتئاب استناداً إلى سلم قياس أدنبره للاكتئاب التالي للولادة. وشارك في الدراسة 506 إمرأة قبل ولادتها، ولم يكن لدى 126 منهن (24.9٪) اكتئاب (درجاتهنّ في سلم القياس أقل من 10)، ولدى 53 منهن (10.5٪) أحراز تتراوح بين 10 و12، ولدى 327 منهن (64.6٪) أحراز تزيد على 12. وقد كانت أحراز الاكتئاب (التي تساوي أو تزيد على 10) أكثر شيوعاً لدى الأمهات اللاتي تقل أعمارهن عن 20 عاماً (93.7٪) مما هي عليه لدى اللواتي تزيد أعمارهن على 35 عاماً (55.0٪). وتعرف الباحثون على أن الخوف من الولادة والانفصال عن الزوج هما أكثر عوامل الاختطار أهمية لحدوث الاكتئاب قبل الولادة، في حين أن قصة عائلية بمرض نفسي هي عامل وقائي هام، كما وجد الباحثون أن كلاً من العنف المنـزلي ومعاقرة المخدرات، وفقدان الدعم، وسوابق الإجهاض، والسوابق الشخصية لمرض نفسي سابق لا تُعَدُّ عوامل اختطار مهمة.

ABSTRACT Mental health is an important but neglected component of reproductive health. This study aimed to determine the prevalence and risk factors for antenatal depression among women attending for antenatal care at an urban tertiary care hospital in Lahore, Pakistan. In a cross-sectional study, structured questionnaires were filled and screening for depression was done using the Edinburgh postnatal depression scale (EPDS). Out of 506 antenatal attendees 126 (24.9%) had no depression (EPDS scores < 10), 53 (10.5%) scored 10–12 and 327 (64.6%) had EPDS scores > 12. Depression scores (≥ 10) were more common in mothers aged < 20 years (93.7%) than those aged > 35 years (55.0%). Fear of childbirth and separation from husband were identified as significant risk factors for development of antenatal depression, while family history of psychiatric illness was significant protective factor. Domestic violence, drug abuse, lack of support, previous miscarriage and personal history of previous psychiatric illness were not found to be significant risk factors.

Dépression prénatale et facteurs prédictifs à Lahore (Pakistan)

RÉSUMÉ La santé mentale est une composante importante et pourtant négligée de la santé génésique. La présente étude visait à déterminer la prévalence et les facteurs de risque de la dépression prénatale chez les femmes consultant un service de soins prénatals à l'hôpital de soins de santé tertiaires de la ville de Lahore (Pakistan). Dans une étude transversale, des questionnaires structurés ont été complétés puis analysés à l'aide de l'*Edinburgh postnatal depression scale* (échelle de dépression post-natale d'Édimbourg) à la recherche d'indications de dépression. Sur les 506 patientes en période prénatale, 126 (24,9 %) ne souffraient pas de dépression (scores < 10), 53 (10,5 %) ont obtenu des résultats entre 10 et 12 et 327 (64,6 %) ont eu des résultats supérieurs à 12 sur l'échelle de dépression post-natale d'Édimbourg. Les scores de dépression (≥ 10) étaient plus fréquents chez les femmes âgées de moins de 20 ans (93,7 %) que chez celles de plus de 35 ans (55,0 %). La peur de l'accouchement et une séparation conjugale ont été identifiées comme des facteurs de risque significatifs pour le développement de la dépression prénatale, alors que les antécédents familiaux de maladie psychiatrique étaient des facteurs de risque protecteurs importants. La violence domestique, la toxicomanie, l'absence de soutien et des antécédents de fausses-couches et de maladie psychiatrique chez la patiente n'ont pas été identifiés comme des facteurs de risque importants.

[1]Department of Community Medicine, Federal Postgraduate Medical Institute and Shaikh Khalifa Bin Zayed Al-Nahyan Medical College, Lahore, Pakistan (Correspondence to A. Humayun: drayeshah@gmail.com). [2]Department of Psychiatry and Behavioural Sciences; [4]Department of Community Health Sciences, Fatima Memorial Hospital College of Medicine and Dentistry, Lahore, Pakistan. [3]Department of Psychiatry, King Edward Medical University, Lahore, Pakistan. [5]Department of Community Medicine, Akhtar Saeed Medical and Dental College, Lahore, Pakistan.

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Introduction

Mental health is an important but neglected component of reproductive health. About 10%–15% of women in industrialized countries and between 20%–40% of women in developing countries experience depression during pregnancy or after childbirth. The effects of depression, anxiety and demoralization are amplified in the context of social adversity and poverty [1]. Symptoms of antenatal depression include sadness during most of the day, hopelessness, lack of interest and fatigue, trouble sleeping and eating along with extreme irritability and inability to feel happiness or enjoy. Moreover, inability to feel happy about the pregnancy adds to the confusion and guilt in the affected women. Antenatal depression can have clinical implications such as increased uterine irritability, pregnancy-induced hypertension, pre-eclampsia, postpartum bleeding, decreased uterine artery blood flow and preterm delivery. Common consequences also include emotional and behavioural problems and cognitive delay in children of depressed mothers [2].

Widely ranging rates of depression during pregnancy have been found: for example from 27% to 62% [3–5]. A comparison between Pakistani and Canadian women showed a higher proportion of Pakistani women (48.4%) with antenatal depression than aboriginal (31.2%) and Caucasian (8.6%) Canadian women [6]. Risks for depression or anxiety during pregnancy are similar to the risk factors for any other depressive episode. They include personal or family history of depression, relationship difficulties, stressful life events, history of abuse, lack of social support and family violence [2,7]. Previous pregnancy loss, problems with pregnancy, unplanned pregnancy and fear of childbirth have also been identified as risk factors for antenatal depression [8]. A study by two of the authors of the current paper to determine the frequency of probable antenatal depression in pregnant women in Pakistan in the 3rd trimester and to assess the risk factors showed a prevalence of 42.7% and identified a number of effects on obstetric and neonatal outcomes [9]. Another study from Pakistan reported the prevalence of anxiety and/or depression among pregnant women was only 18%. Husband unemployment, lower household wealth, having 10 or more years of formal education and an unwanted pregnancy along with physical/sexual and verbal abuse were associated with depression and/ or anxiety [10].

The current study aimed to identify the frequency of antenatal depression among women attending for antenatal care at a tertiary care hospital in Lahore and to identify the potential risk factors for antenatal depression.

Methods

Sample

The sample size was calculated using an expected prevalence of antenatal depression as 10.7% [11]. The study population was antenatal attendees in their 3rd trimester. All pregnant women in their 3rd trimester consecutively attending the antenatal clinics at a tertiary care hospital in Lahore over the period May to July 2007 were recruited (n = 506); women in the 1st and 2nd trimesters were excluded.

Ethical approval for the study was obtained from the ethical review committee of the FMS Center for Health Research, Lahore. The study was conducted in compliance with the ethical principles for medical research involving human subjects of the Helsinki Declaration [12]. Patient names were not recorded to assure confidentiality. Verbal consent was obtained from all subjects and documented in the presence of a witness.

Data collection

All women completed the Edinburgh Postnatal Depression Scale (EPDS) [13] and a structured questionnaire that was filled through personal interviews by psychiatry postgraduate students. To identify all those with minor or major depression we used the cut off of EPDS score ≥ 10, but to obtain the frequency of major depression in antenatal period we also analysed patients having EPDS score >12. The questionnaire included information about demographic and other potential risk factors for antenatal depression. These variables included history of previous miscarriages, unplanned pregnancy, fear of childbirth, lack of support, separation from husband, domestic violence, drug abuse, family and personal history of psychiatric disorder as nominal variables.

Analysis

The data were entered and analysed using *SPSS*, version 16.. For the statistical analysis, the chi-squared test was applied and the statistical association of different factors with the presence of depression in antenatal attendees was determined.

Results

The mean age the women was 26.5 [standard deviation (SD) 4.2] years, with a range of 18–40 years. The great majority (93.7%) were in the age group 20–30 years. The women included in the study had gestation between 26 to 36 weeks.

Out of these 506 antenatal attendees, 126 (24.9%) screened negative for depression (EPDS score < 10), 53 (10.5%) screened positive for depression at EPDS scores between 10–12 and 327 (64.6%) screened positive at the EPDS cut-off > 12. i.e. a total of 380 (75.1%) screened positive at the EPDS cut-off ≥ 10.

In younger mothers aged < 20 years, depression (EPDS score ≥ 10)

was much more common (8/9, 93.7%) than among older mothers aged > 35 years (11/20, 55.0%). The prevalence of depression scores among the women according to the risk factors measured are shown in Table 1 for depression scores 10–12 and ≥ 12.

Table 2 shows the prevalence of depression comparing cut-off scores < 10 with ≥ 10. The fear of childbirth and separation from husband were identified as significant risk factors for development of antenatal depression, whereas family history of psychiatric illness was a significant protective factor, Among women who feared childbirth 77.8% had depression scores compared with 69.8% among those who did not fear childbirth ($P = 0.046$) and 86.5% of women who were separated from their husbands had depression scores versus 73.8% who were not separated ($P = 0.044$). In contrast, among women who had a family history of psychiatric illness only 58.3% had depression scores compared with 76.9% of women with no family history ($P = 0.005$).

Domestic violence, drug abuse, lack of support, previous miscarriage and history of previous psychiatric illness were not found to be significant risk factors for antenatal depression in our study. Although more women with a history of domestic violence had depression scores (94.1% versus 74.4%), the numbers of women reporting domestic

Table 1 Risk factors for antenatal depression among the study sample of pregnant women in their 3rd trimester

Variable	Total (*n* = 506)	Screened negative EPDS score < 10 (*n* = 126)		Screened positive EPDS score 10–12 (*n* = 53)		EPDS score > 12 (*n* = 327)	
	No.	No.	%	No.	%	No.	%
Age (years)							
< 20	9	1	11.1	0	0.0	8	88.9
20–35	477	116	24.3	49	10.3	312	65.4
> 35	20	9	45.0	4	20.0	7	35.0
Pregnancy							
Unplanned	233	58	24.9	27	11.6	148	63.5
Planned	276	68	24.6	26	9.4	179	64.9
Fear of childbirth							
Yes	334	74	22.2	40	12.0	220	65.9
No	172	52	30.2	13	7.6	107	62.2
Miscarriage or intrauterine death							
Yes	180	39	21.7	22	12.2	119	66.1
No	326	87	26.7	31	9.5	208	63.8
Lack of support							
Yes	93	22	23.7	9	9.7	62	66.7
No	413	104	25.2	44	10.7	265	64.2
Separation from husband							
Yes	52	7	13.5	10	19.2	35	67.3
No	454	120	26.4	43	9.5	292	64.3
Domestic violence							
Yes	17	1	5.9	4	23.5	12	70.6
No	492	125	25.4	49	10.0	315	64.0
Drug abuse							
Yes	26	4	15.4	3	11.5	19	73.1
No	480	122	25.4	50	10.4	308	64.2
Previous psychiatric illness							
Yes	34	6	17.6	3	8.8	25	73.5
No	472	120	25.4	50	10.6	302	64.0
Family history of psychiatric illness							
Yes	48	20	41.7	3	6.3	25	52.1
No	458	106	23.1	50	10.9	302	65.9

violence (physical or verbal or both type of violence) were very small and this did not reach statistical significance ($P = 0.085$). More women with a personal history of psychiatric illness had depression than those without (82.4% versus 74.6%), so too did those with a history of drug abuse compared with those who did not (84.6% versus 74.6%) but these were also not significant ($P = 0.41$ and $P = 0.249$ respectively).

Discussion

A high prevalence of antenatal depression has previously been found in women in Rawalpindi, Pakistan [14]. In the current study in Lahore, the frequency of 3rd trimester antenatal attendees who screened positive for antenatal depression above the EPDS cut-off score of 10 was 75.1% and above the cut-off score of 12 was 64.6%, which is high compared with other studies in Pakistan and elsewhere [11,15–18]. In a study by Gorman et al. from 10 sites in 8 countries the overall antenatal point prevalence rate for caseness was 11.8%, the rate for depression was 6.9%, the rate for major depression was 3.5% and the rate for EPDS score 13+ was 8.7% [18]. A recent meta-analysis of 21 studies concluded that the mean prevalence of depression across the antenatal period was 10.7%, ranging from 7.4% in the 1st trimester to a high of 12.8% in the 2nd trimester [11].

An interesting finding in our study was the higher rate of depression in younger mothers aged < 20 years than older mothers, which might be explained by the younger women's lack of experience, immaturity and emotional instability [19,20]. In a study in the United States (US) young maternal age was associated with greater risk of antenatal and postpartum depressive symptoms, which were attributed to financial hardship, unwanted pregnancy and lack of a partner [21]. Similar findings were reported in other studies from the United Kingdom and US [22,23]. The mean age of our women was 26.5 years, which is identical to a hospital-based study of postnatal depression in Pakistan that showed the average age

Table 2 Statistical analysis of risk factors for antenatal depression among the study sample of pregnant women in their 3rd trimester

Risk factor	Total	Screened negative EPDS score < 10 (*n* = 126)		Screened positive EPDS score ≥ 10 (*n* = 380)		*P*-value
	No.	No.	%	No.	%	
Fear of childbirth						
Yes	334	74	22.2	260	77.8	0.046
No	172	52	30.2	120	69.8	
Miscarriage or intrauterine death						
Yes	180	39	21.7	141	78.3	0.21
No	326	87	26.7	239	73.3	
Lack of support						
Yes	93	22	23.7	71	76.3	0.75
No	413	104	25.2	309	74.8	
Separation from husband						
Yes	52	7	13.5	45	86.5	0.044
No	454	119	26.2	335	73.8	
Domestic violence						
Yes	17	1	5.9	16	94.1	0.085
No	489	125	25.6	364	74.4	
Drug abuse						
Yes	26	4	15.4	22	84.6	0.25
No	480	122	25.4	358	74.6	
Previous psychiatric illness						
Yes	34	6	17.6	28	82.4	0.41
No	472	120	25.4	352	74.6	
Family history of psychiatric illness						
Yes	48	20	41.7	28	58.3	0.005
No	458	106	23.1	352	76.9	

of women was 26 years. Women with depression were mostly in their 2nd or 3rd confinements (38%) [24].

Factors found to be statistically associated with a higher risk of depression in our study were fear of childbirth and separation from the husband, while family history of psychiatric illness was protective factor for depression. A fear of childbirth in our culture might be related to the process of delivery, the sex of the baby or poor faith in the care provider. These possibilities needs to be explored in further studies as fears related to childbirth need to be determined in the context of Pakistan. Domestic violence, previous miscarriage and personal history of previous psychiatric illness were not found to be risk factors for antenatal depression in our study. Our findings contrast with a study reporting that the strongest factors associated with depression/anxiety were physical/sexual and verbal abuse [10]. They also contradict a previous study in Pakistan which found that 72% of women who were physically abused during pregnancy were anxious/depressed [25]. In the US study, the strongest risk factor for antenatal depressive symptoms was a history of depression (OR = 4.07), and the strongest risk for postpartum depressive symptoms was depressive symptoms during pregnancy (OR = 6.78) or a history of depression before pregnancy (OR = 3.82) [19]. Another study from Pakistan showed a high frequency of antenatal depression (42.7%) and reported the risk factors to be problems in the marriage, problems with parents/in-laws, history of domestic violence, past history of psychiatric problems and history of postnatal depression. Among the obstetric risk factors, history of previous miscarriages, stillbirth and complications in previous pregnancies reached statistical significance. Moreover, women with antenatal depression faced more obstetric complications and their babies had significantly lower birth weights and lower mean Apgar scores [9]. The study was conducted in a tertiary care setup, which mainly caters upper lower and lower middle socioeconomic class of patients.

The finding that the association of family history of psychiatric illness was protective, rather than a risk, for antenatal depression suggests a context-specific situation as the females here had specific cultural, social and economic conditions. A meta-analysis by O'Hara and Swain using 77 studies, showed no association of family history of depression with postpartum depression [26].

One limitation of this study was lack of follow-up of these women into the natal and postnatal period in order to determine neonatal outcomes and possible development of postnatal depression. This was due to financial and logistic constraints of the research. This is, however, an areas for future research. Antenatal depression itself is a predictor of postnatal depression. Findings from a study in Egypt revealed that the prevalence of antepartum depression was 25.3% and that antepartum depression was significantly linked to postpartum depression and negative attitudes to breastfeeding [27]. In a study in the United Arab Emirates in which women were followed from the second trimester of pregnancy until 4 months postpartum, depression in the 2nd and 3rd trimesters was found to be significantly associated with postnatal depression [28], while a study in the Islamic Republic of Iran showed that antenatal state and trait anxiety at 28 and 38 weeks of gestation were independent risk factors associated with postnatal depression [29].

In the present study, despite the high rate of depression, none of the women had been screened for depression and other psychiatric illnesses during routine antenatal checkups. Therefore none of them were receiving any treatment, which means that these females were at risk of developing postnatal depression. To address the growing epidemic of antenatal depression in Pakistan [6], we need to look into its epidemiological basis in our sociocultural context and then plan preventive and control measures.

Conclusions

Depression was highly prevalent in hospital antenatal attendees in an urban area of Pakistan. Many of the predictors, such fear of childbirth and separation from husband, are modifiable through awareness and counselling. Mental health should be made an integral part of reproductive health services in Pakistan and there is a need to conduct antenatal screening of women for depression and other psychiatric illness, through close collaboration of psychiatry services with the preventive obstetric services.

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Physical abuse in basic-education schools in Aden governorate, Yemen: a cross-sectional study

A.S. Ba-Saddik[1] and A.S. Hattab[2]

الإيذاء الجسدي في مدارس التعليم الأساسي في محافظة عدن، باليمن: دراسة مستعرضة

آمال صدّيق سالم باصديق، عبد الله سعيد حطّاب

الخلاصة: يؤدي الإيذاء الجسدي في المدارس إلى عواقب تصيب صحة الأطفال مدى حياتهم وتؤثر على أدائهم التعليمي. وقد صمّم الباحثان هذه الدراسة من أجل تقييم معدل انتشار الإيذاء الجسدي للتلاميذ في مدارس التعليم الأساسي في محافظة عدن، باليمن، ولدراسة عوامل الاختطار المرافقة له؛ وهي دراسة مستعرضة شملت 1066 تلميذاً اختيروا عشوائياً من الصفوف السابع وحتى التاسع في ثماني مدارس موزعة على المناطق المختلفة في محافظة عدن، وذلك باستكمال استبيان ينفَّذ ذاتياً، مغفل من الأسماء. وقد اتضح من الدراسة أن ٪55.7 من التلاميذ قد أبلغوا عن تعرضهم للإيذاء الجسدي لمرة واحدة على الأقل في فترة من فترات حياتهم (٪73.2 لدى الذكور و٪26.6 لدى الإناث) وكان المدرسون هم أكثر المقترفين للأذى الجسدي (٪45.4). ووجد الباحثون ترابطاً يعتد به إحصائياً بين الإيذاء الجسدي وبين كلٍّ من الجنس، والمجموعة العمرية، ونمط الأسرة، وتعلُّم الأب. وكانت المنبئات التي يُعتدَّ بها إحصائياً بالإيذاء الجسدي وفق التحوُّف المتعدد المتغيرات هو جنس الذكورة (معدل الأرجحية = 7.89)، ونمط الأسرة الموسعة (معدل الأرجحية = 1.36). ويرى الباحثون أن الإيذاء الجسدي في مدارس التعليم الأساسي يتطلب اهتماماً جدياً من قبل السلطات التعليمية والعائلات والمجتمع بأسره.

ABSTRACT Physical abuse in school has lifelong consequences affecting child health and educational achievements. A study was designed to assess the prevalence of physical abuse experienced by pupils in basic-education schools in Aden, Yemen, and to examine the risk factors associated with it. A cross-sectional study covering 1066 pupils in 7th–9th grades from 8 schools in different districts of Aden governorate were randomly selected. Answering an anonymous self-administered questionnaire, 55.7% of pupils reported physical abuse at least once in their school lifetime (73.2% of males versus 26.6% of females). Teachers were the main perpetrators (45.4%). A statistically significant association was found between physical abuse and sex, age group, family type and father's education. Significant predictors of physical abuse on multivariate regression were male sex (OR = 7.89) and extended family type (OR = 1.36). Physical abuse in basic-education schools requires serious consideration by educational authorities, families and the community at large.

Violence physique dans des écoles primaires du Gouvernorat d'Aden (Yémen) : étude transversale

RÉSUMÉ La violence physique dans les écoles a des répercussions tout au long de la vie, affectant la santé de l'enfant et ses performances scolaires. Une étude a été conçue pour évaluer la prévalence de la violence physique vécue par des élèves dans des écoles primaires d'Aden (Yémen) et pour examiner les facteurs de risque associés. Dans une étude transversale, 1 066 élèves en classes de septième, huitième et neuvième ont été sélectionnés aléatoirement dans huit écoles de différents districts du Gouvernorat d'Aden. D'après les réponses au questionnaire auto-administré et anonyme, 55,7 % des élèves ont déclaré avoir souffert de violence physique au moins une fois dans leur vie scolaire (73,2 % de garçons contre 26,6 % de filles). Les enseignants étaient les principaux auteurs de violence (45,4 %). Une coorélation statistique significative a été constatée entre la violence physique et le sexe, la tranche d'âge, le type de famille et le niveau d'études du père. Être de sexe masculin (OR = 7,89), et appartenir à une famille élargie (OR = 1,36) comptaient parmi les facteurs prédictifs importants pour la violence physique à l'analyse de régression multivariée. La violence physique dans les écoles primaires requiert toute l'attention des autorités responsables de l'enseignement, des familles et de la communauté dans son ensemble.

[1]Department of Behavioural Sciences; [2]Department of Social Medicine and Public Health, Faculty of Medicine and Health Sciences, University of Aden, Aden, Yemen (Correspondence to A.S. Ba-Saddik: abasaddik@gmail.com).

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Introduction

Schools play an important role in children's lives [1]. Nevertheless, the school is one setting where abuse of children can occur. A United Nation's study on violence against children revealed a high incidence of violence committed by teachers and school staff as well as by other students [2]. Both physical and psychological forms of abuse in school are reported, usually both together. Several studies have consistently shown that physically abused children have poorer school performance and lower educational achievement than non-abused pupils [3–5]. Physical abuse also has long-lasting effects on mental health, social isolation, criminal behaviour, drug and alcohol misuse, risky sexual behaviour and even obesity, which persist into adulthood [6–9].

Globally, less than 20 of the world's 190-plus countries have as yet prohibited all forms of corporal punishment, and so only 52 million children out of the world's 2 195 million live in countries where the law gives them equal protection from being assaulted. In about 90 countries out of 197 worldwide, corporal punishment is still authorized in schools and other institutions, including at least 7 states in the Middle East and North Africa [10].

A survey carried out in a wide range of developing countries found that between 20% and 65% of school-age children reported having been verbally or physically bullied in school in the previous 30 days [11]. Several family and community-based studies into child abuse conducted in the Middle East reported that teachers were among the perpetrators of physical abuse [12–17]. In Palestine, a study revealed that 32.3% of the participants had been subjected to physical abuse by their teachers [14]. In Egypt, a survey reported that a substantial proportion of boys (80.0%) and girls (61.5%) incurred physical punishment by a teacher during the scholastic year [17]. In Bahrain, corporal punishment was experienced by 23% of girls at a school [15]. In the Islamic Republic of Iran, in Kurdistan province, a study found that 43.3% of the students had been subjected to physical abuse at school [16].

There is a general scarcity of data on child abuse in school settings in developing countries. In Yemen, only 2 community-based studies were found, both reporting extremely high rates of physical punishment experienced by pupils at school (81.7% and 90% respectively) [18,19]. The current study is the first school-based study among pupils to be conducted in Yemen and aimed to assess the prevalence of physical abuse in basic-education schools in Aden. It is expected that it will increase the awareness of the educational authorities, families and the community at large about the magnitude of this problem and the importance of developing appropriate approaches for its control and management.

Methods

Study design and setting

A cross-sectional survey was conducted in 4 randomly selected districts in Aden governorate. The study target was pupils in grades 7, 8 and 9 of basic-education schools during the school year 2009–10. Children in the ages 12–17 years are usually able to perceive what is and is not abuse within the school context, and are capable of answering a questionnaire and providing reliable information [17,20].

Study population and sample size

The sample size was calculated using the assumed proportion of 0.5 in order to obtain the maximum possible sample size, with a level of confidence 95%, and 0.03, as maximum allowable error. Accordingly, the calculated sample size was 1066 pupils, which was proportionally distributed according to the sex ratio in schools (667 males and 399 females). A multi-stage stratified random sampling was performed. In the first stage, 4 districts were randomly selected. In the second stage, 2 schools from each district also were randomly selected. In third stage, systematic random sampling was applied to select the number of pupils assigned in each grade in the selected schools.

Data collection

Instrument

An anonymous, self-administrated questionnaire adapted from the Arabic version of the International Child Abuse Screening Tool–Children's Institutional Version (ICAST-C) [20] was used for data collection. The first part of the instrument covered questions about pupil's variables (sex, age, school grade, residence), in addition to parents' sociodemographic variables (family type, parents' education and parents' marital status). The second part asked about different items of abuse acts.

To examine the validity and reliability of the questionnaire we conducted a pilot study that covered 60 pupils (30 males and 30 females) from 2 schools not included in the main study, to ensure that the questionnaire items were clear, understandable and culturally acceptable. The validity of the questionnaire was tested using the content validity method, where the questionnaire was reviewed and judged by 3 experts in child abuse from Yemeni universities, to assess each item's readability, clarity and comprehensiveness and to find out if it was socially acceptable. Accordingly, some items were rephrased, and some others were dropped. The reliability of internal consistency for the questionnaire items was tested by entering data from the pilot study and the Cronbach alpha coefficient that was found to be 0.78.

In the final modified version of the questionnaire the pupils were asked: "Have you ever been exposed to any of

these acts at school?": slapped on your face, beaten on your head, beaten on your shoulder, twisting ear, throwing an object at you, punching, kicking, pinching, hands crushing, standing in a way that hurts, standing outside in the sun, taking food away from you, pulling hair, finger crushing, choking. We explained the questionnaire in detail to the pupils, and asked them to answer yes or no to each item. Those who responded affirmatively were asked how many times they had experienced the abuse act during their school life and who was the perpetrator (teachers or school administrative staff). The rate of physical abuse was calculated by recoding the acts into dichotomous categories (0 = never and 1 = once or more). A 4-point scale was used to score how often they had experienced each abuse act (0 = none; 1 = 1–2 times; 2 = 3–4 times; 3 = ≥ 5 times) [21].

Operational definition

Physical abuse in this study referred to pupils' reports of any act that occurred to them by teachers or other school administrators (school principal, vice principal or other workers) that could potentially victimize them while in school [22]. Physically abused pupils were defined as those who answered positively to one or more of the physical abuse acts.

Ethical considerations

The research protocol was approved by the research committee for postgraduate studies in the Faculty of Medicine and Health Sciences. Several levels of permission were granted before the study could proceed, including official approval from the authority of Aden Education Office and then permission was sought from the districts directors of education, followed by the permission of school principals.

A written informed consent was sent to the pupils' parents describing the nature of the study, its importance and its objectives. It also stated that the data confidentiality would be assured, participation in the study was voluntary and those who refused participation would not lose any rights or privileges. Parents were asked to put their signature if they agree to have their child participate in the survey. About 15% of the parents initially selected did not agree for their children to participate in the survey, and other pupils were substituted to achieve the target sample size. Finally, parental consent was obtained for each pupil who participated in the study.

The pupils' informed assent was taken orally, detailed explanation of the objectives and the importance of the research were provided, and they were assured that all information obtained would be handled confidentially. Pupils were informed that they had the right to decline answering any question and to withdraw from the study at any time. All pupils whose parents gave consent to their participation agreed to participate in the study.

Data analysis

SPSS, version 16 was used for data analysis. Quantitative variables were normally distributed after testing for normality using the Kolmogorov–Smirnov test. Percentages were calculated as summary measure for the qualitative variables. Arithmetic mean and standard deviation (SD) was used to express the quantitative variables. The association between child's characteristics and physical abuse were tested using the chi-squared test. The statistical significant level was set at P-value < 0.05.

The multivariate analysis was done by the binary logistic regressions to identify risk factors associated with the outcome (dependent variable), i.e. physical abuse. For the dependent outcome, no abuse was coded "0" and abuse was coded "1". The results were discussed in terms of the adjusted odds ratio (OR) alongside its 95% confidence interval (CI).

Results

Sociodemographic characteristics of the study sample

Table 1 shows the socioeconomic characteristics of the study sample. Male pupils constituted the highest proportion (62.6%). The mean age was 14.0 (SD 1.1) years. Most of the pupils (70.1%) lived in nuclear families. More than 50% of mothers were illiterate or could just read and write.

Prevalence of physical abuse

A total of 594 out of 1066 pupils reported experiencing one or more physical abuse acts during their school life, a prevalence of 55.7%. Teachers were by far the most common perpetrators (45.4% of cases) compared with administrative staff (6.0%), while 4.3% of children reported being abused by both teachers and administrative staff.

As summarized in Table 2 the most common physical abuse act reported by pupils was standing in a way that hurts (40.0%), twisting ear (34.4%) and standing outside in the sun (33.9%). The lowest physical abuse acts experienced by the pupils were choking (4.1%), punching (4.7%) and slapping on the face (8.3%).

There were statistically significant differences by sex. Males were more likely than females to experience all kinds of abuse and this difference was significant for all except 1 type of abuse (Table 2).

Association analysis

As demonstrated in Table 1, the independent variables that showed a significant association with physical abuse were pupils' sex, age group, father's education and family type. Pupils were more likely to experience violence if they were male, of an older age, had an illiterate father and lived in an extended family.

Table 3 displays the variables with significant univariate associations entered into the multivariate logistic regression. The only significant predictors

Table 1 Prevalence of physical abuse experienced by basic-education pupils, by personal and family demographic characteristics

Variable	Total	Experienced physical abuse		*P*-value
	No.	No.	%	
Total	1066	594	55.7	
Pupil's sex				
Male	667	488	73.2	< 0.001
Female	399	106	26.8	
Pupil's age group (years)				
12–13	363	176	48.5	
14–15	618	364	58.9	0.002
16–17	85	54	63.5	
School grade				
7	322	173	53.7	
8	366	214	58.5	0. 410
9	378	207	54.8	
Mother's education				
Illiterate	264	152	57.6	
Read/write	324	192	59.3	
Basic	177	97	54.8	0.288
Secondary	162	82	50.6	
University	139	71	51.1	
Father's education				
Illiterate	74	46	62.2	
Read/write	281	163	58.0	
Basic	103	63	61.2	0.029
Secondary	202	93	46.0	
University	406	229	56.4	
Family type				
Nuclear	747	393	52.6	0.002
Extended	319	201	63.0	
Parents' marital status				
Married	952	527	55.4	
Separated	21	13	61.9	0.169
Divorced	33	24	72.7	
Widowed	60	30	50.0	

for physical abuse remaining in the model were male sex (OR = 7.89; 95% CI: 5.84–10.6) ($P < 0.001$) and extended family type (OR = 1.36; 95% CI: 1.00–1.84) ($P < 0.05$).

Discussion

The present study is the first of its kind in Aden governorate to address physical abuse in schools. Covering a representative sample of public basic-education school pupils it aimed to study the prevalence of physical abuse at school and its associated factors. The study findings revealed that more than a half of pupils (55.7%) had experienced at least 1 abuse act by teachers in their school life. This finding is lower than what was reported from India and Egypt (65% and 72.8% respectively) [17,23]. The lower rate in our study could be explained by the fact that this study covered pupils in basic-education schools in Aden governorate, while in India, the study was a national study and that in Egypt included both basic- and secondary-school pupils.

Physical punishment as a form of discipline for school pupils is still socially acceptable in many communities. Teachers, who may themselves have suffered similar acts as children, might believe that it is normal to use physical force to make pupils better disciplined [24,25]. This applies to many countries in the region, including Yemen [17,26]. Other studies reported that teachers perceived corporal punishment of pupils as a form of social control [24]. However, such interpretations require further investigation.

Abuse by teachers was experienced by 45.4% of children, which is very close to what was reported from India (44.8%) [23], a little higher than what was found in the Islamic Republic of Iran (43.3%) [16] and much higher than that reported from Lebanon (24.7%) [11]. On the other hand, higher rates of physical abuse by teachers were reported by studies from Korea, China and Egypt (62%, 51.1% and 72.8% respectively) [17,27]. The difference in the rates reported in these studies and our findings could be explained by differences in study design and time frame.

The current study revealed that male pupils were more frequently physically abused than females (73.2% and 26.8% respectively). This finding is consistent with other studies [11,17,21,23]. This difference also could be interpreted as an expression of cultural values and norms dominant in traditional societies, where touching the female body is considered impermissible [17]. On the other hand, male pupils are likely to be more engaged in and more permissive to school violence behaviour than females [12]. We believe that both explanations are valid.

Table 2 Distribution of pupils' reported experience of physical abuse, by sex

Types of physical abuse	Males (*n* = 667)		Females (*n* = 399)		Total (*n* = 1066)		*P*-value
	No.	%	No.	%	No.	%	
Standing in a hurtful way	296	44.4	130	32.6	426	40.0	0.011
Twisting ear	316	47.4	51	12.8	367	34.4	< 0.001
Standing in the sun	244	36.6	117	29.3	361	33.9	0.086
Beating shoulder	268	40.2	81	20.3	349	32.7	< 0.001
Beating head	260	39.0	35	8.8	295	27.7	< 0.001
Pinching	157	23.5	32	8.0	189	17.7	< 0.001
Crushing fingers	154	23.0	15	3.8	169	15.9	< 0.001
Throwing with objects	128	19.2	39	9.8	167	15.7	< 0.001
Pulling hair	150	22.5	14	3.5	164	15.4	< 0.001
Crushing hands	151	22.6	12	3.0	163	15.3	< 0.001
Taking food away	101	15.1	29	7.3	130	12.2	0.002
Slapping face	80	12.0	9	2.3	89	8.3	< 0.001
Kicking	67	10.0	1	0.3	68	6.4	< 0.001
Punching	50	7.5	0	0.0	50	4.7	< 0.001
Choking	40	6.0	4	1.0	44	4.1	< 0.001

Pupils in older age groups reported higher rates of physical abuse than younger age groups (63.5% of 16–17-year-olds versus 58.9% of 14–15-year-olds and 48.5% of 12–13-year-olds). This finding is consistent with a study in India [23]. Others explained this difference by the longer lifespan of older children who could have more courage to disclose their experiences [12]. Although there was no significant association between school grade and the prevalence of physical abuse, pupils in higher grades were more frequently abused. A number of studies [17,21,28], reported similar findings. It seems that the relationship between physical abuse

Table 3 Logistic regression analysis of personal and family demographic characteristics associated with physical abuse

Variable	Univariate analysis		Multivariate analysis	
	OR	95% CI	OR	95% CI
Pupil's sex				
Female	1.00	Ref.	1.00	
Male	7.54	5.69–9.98***	7.89	5.84–10.6***
Pupil's age group (years)				
12–13	1.00	Ref.	1.00	
14–15	1.52	1.17–1.98**	1.14	0.84–1.54
16–17	1.85	1.14–3.01*	0.88	0.51–1.52
Family type				
Nuclear	1.00	Ref.	1.00	
Extended	1.53	1.17–2.01**	1.36	1.00–1.84*
Father's education				
Illiterate	1.00	Ref.	1.00	
Read/write	1.27	0.76–2.11	0.88	0.49–1.56
Basic	1.07	0.79–1.45	1.27	0.64–2.52
Secondary	1.22	0.78–1.89	0.76	0.41–1.39
University	0.66	0.47–0.93*	1.40	0.80–2.47

**P < 0.05; **P < 0.01; ***P < 0.001.*
OR = odds ratio; CI = confidence interval.
Ref. = reference category.

and school grade were not studied sufficiently, and further investigation is required to better understanding this problem.

Our study showed that pupils living in extended families experienced more physical abuse in school than those in nuclear families. This could be interpreted according to the social learning theory, whereby children in extended families live in more crowded homes, therefore witnessing more family violence, and may also remain outdoors longer hours, observing and imitating aggressive behaviours which affects their relationship with schoolteachers and make them more exposed to physical abuse [29].

The study findings revealed an inverse association between father's educational level and the prevalence of physical abuse. Fathers with lower education levels may be unable to avail themselves of the resources needed for coping with family problems and to avoid abusive relationships; therefore, they resort to violent behaviour to deal with family problems [30]. This morbid environment can negatively affect the children's behaviour and makes them more vulnerable to different types of abuse and violence.

Conclusion

Physical abuse is a major public health and educational problem in basic school education, particularly among male pupils. Children of extended families were more victimized. Teachers stood out as the main perpetrators. Further studies are required to investigate indepth the risk factors associated with this problem, particularly the school and family environment. The educational authorities should take the appropriate measures to promote school safety and to adopt policy that enforces non-violent disciplinary approaches.

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Preventing child maltreatment: a guide to taking action and generating evidence

Preventing child maltreatment: a guide to taking action and generating evidence is a joint publication of the World Health Organization (WHO) and the International Society for Prevention of Child Abuse and Neglect (ISPCAN). It aims to assist governments, NGOs and international agencies to undertake scientifically informed programmes to prevent child maltreatment. The ultimate objective is a world in which all countries routinely implement child maltreatment prevention programmes based on sound epidemiological data and on local experimental studies of what is effective in prevention.

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Do personal beliefs and peers affect the practice of alcohol consumption in university students in Lebanon?

J. Salamé,[1] B. Barbour[2] and P. Salameh[3,4]

هل تؤثر المعتقدات الشخصية ومعتقدات الزملاء على ممارسات تعاطي الكحول لدى الطلاب الجامعيين في لبنان؟

جوزيف سلامة، بيرناديت بربور، باسكال سلامة

الخلاصة: يشيع تعاطي الكحول بين الطلاب الجامعيين في لبنان، كما في سائر أنحاء العالم. وقد أجرى الباحثون دراسة مستعرضة في الجامعات الخاصة والعامة في الفترة بين تشرين الأول/ أكتوبر 2009 وأيلول/ سبتمبر 2010، مستخدمين استبياناً مقنَّنا من أجل تقييم المعتقدات الشخصية حول تعاطي الكحول، وسلوكيات الزملاء وآرائهم، وسوابق ممارسات الشرب، ووضعها الحالي. وقد شملت الدراسة 1235 طالباً، كان لدى 199 منهم (16.1٪) درجة تساوي أو تزيد على 8 في اختبار التعرف على الاضطرابات الناجمة عن احتساء الكحول AUDIT. وقد ترافق تزايُد اختطار مشكلة الشرب مع كل من التقدُّم بالعمر، والذكورة، والديانة المسيحية، والانتساب إلى جامعة خاصة، ودراسة اختصاص غير صحي، والسُّكنَى في بيروت أو جبل لبنان. أماً المعتقدات المتعلقة بتعاطي الكحول ومعتقدات الزملاء وسلوكياتهم التي كانت عوامل ترافقت بدرجة يعتد بها إحصائياً مع مشكلة الشرب، فكانت الجهل بمخاطر تعاطي الكحول، وارتفاع معدل تعاطي الكحول مع الأصدقاء، وارتفاع نسبة الأصدقاء الذين يشربون الكحول بانتظام. وتبين للباحثين أن سلوك تعاطي الكحول لدى طلاب الجامعة يتأثر بسلوكيات الزملاء، وأوصَوْا ببرنامج تثقيف للزملاء لإنقاص اختطار مشكلة شرب الكحول.

ABSTRACT Alcohol consumption is frequent among university students in Lebanon as elsewhere in the world. A cross-sectional study was conducted in Lebanon's public and private universities between October 2009 and September 2010 using a standardized questionnaire to assess personal beliefs about alcohol consumption, peers' behaviours and opinions and history of and current drinking practices. Of 1235 students, 199 (16.1%) had an AUDIT score ≥ 8. Older age, male sex, Christian religion, attending a private university, studying a non-health specialty and residing in Beirut or Mount Lebanon were associated with a higher risk of harmful drinking. Beliefs concerning alcohol consumption and peers' opinions and behaviours were factors significantly associated with harmful drinking, especially: ignoring the dangers of alcohol consumption; higher frequency of consumption with friends; and a higher proportion of friends who drank regularly. University students' alcohol drinking behaviour was mostly influenced by peers' behaviour, and a peer education programme is recommended to decrease the risk of harmful drinking.

Les croyances personnelles et celles des pairs influent-elles sur la consommation d'alcool des étudiants au Liban ?

RÉSUMÉ La consommation d'alcool est fréquente chez les étudiants au Liban comme ailleurs. Une étude transversale a été menée dans des universités publiques et privées du Liban, entre octobre 2009 et septembre 2010, à l'aide d'un questionnaire normalisé visant à évaluer les croyances personnelles en matière de consommation d'alcool, le comportement des pairs et leurs opinions ainsi que les pratiques passées et présentes de consommation d'alcool. Sur un total de 1 235 étudiants, 199 (16,1 %) ont obtenu un score AUDIT supérieur ou égal à 8. Être plus âgé, de sexe masculin, ou chrétien, fréquenter une université privée, étudier un autre domaine que la santé, vivre à Beyrouth ou dans la région du Mont-Liban étaient des facteurs associés à un risque accru de consommation nocive d'alcool. Les croyances concernant la consommation d'alcool et l'opinion et le comportement des pairs étaient des facteurs significativement associés à une consommation nocive d'alcool, en particulier le fait d'ignorer les dangers de la consommation d'alcool, d'en consommer fréquemment avec des amis et d'avoir une proportion élevée d'amis qui en consomment régulièrement. Le comportement des étudiants concernant la consommation d'alcool était principalement influencé par celui des pairs. Un programme d'éducation par les pairs est recommandé pour diminuer le risque de consommation nocive d'alcool.

[1]Faculty of Medicine; [2]Faculty of Public Health; [3]Faculty of Pharmacy; [4]Faculty of Public Health, Lebanese University, Beirut, Lebanon (Correspondence to P. Salameh: psalameh@ul.edu.l; pascalesalameh1@hotmail.com).

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Introduction

Alcohol consumption is common among university students all over the world [1,2] and is associated with social [3] and health problems [4] in this population subgroup. For example, alcohol consumption may lead to low academic achievement [5], psychological disturbances [6], social and relational problems [3], illicit drug abuse [7] and physical health problems [4].

In Eastern Mediterranean countries, very few data have been gathered concerning alcohol consumption in general, or by university students in particular [8]. In Lebanon, a study published in 2000 on a limited sample from 2 private universities showed that 49% of students had ever consumed alcohol, 2.4% were alcohol dependent and 2.1% were alcohol abusers [9]. However, underreporting of this habit is likely for religious and social reasons (since alcohol drinking is prohibited in Islam). Therefore, while talking about alcohol consumption is a taboo in our conservative society [10], we suspect that harmful alcohol drinking is increasingly common in this young population.

The objectives of this study were to confirm the validity of the AUDIT score in the Lebanese context before using it to assess harmful drinking in Lebanese students, and to evaluate whether personal beliefs about alcohol consumption and peers' drinking affected alcohol consumption practice and harmful drinking of university students.

Methods

Study design

We conducted a cross-sectional study in Lebanon's public and private universities, between October 2009 and September 2010.

Population and sampling procedure

A cluster proportionate sampling method was used to select students within campuses. From the list of universities provided by the Ministry of Higher Education, we selected universities with the highest proportion of students in Lebanon (1% of students and more). In the public university (Lebanese University; 43.3% of total university students in Lebanon), we sampled all faculties: the faculties of Arts, Law and Political Sciences, Public Health, Medical Sciences, Engineering, Economics, Information and Documentation, Social Sciences, Literature and Humanities and Sciences. The private universities selected were Kaslik Holy Spirit University (4.1%), Saint Joseph University (5.6%), Notre Dame University (2.9%), Beirut Arab University (10.6%), Balamand University (1.9%), Sagesse University (1.0%), American University of Lebanon (1.0%), Lebanese American University (2.9%), American University of Science and Technology (3%), Lebanese Germany University (1%) and Lebanese International University (4.6%). The American University of Beirut (4.2%) refused to participate to the study. In participating universities, we approached all students regardless of their field of specialization.

Data collection

Campus administrators were contacted and permission was given for enquirers to distribute a proportionate cluster sampling of questionnaires according to the number of students in every university. However, within every campus, an accidental sample of students was selected, because administrators did not allow us to have lists of students and interview students accordingly.

A self-administered, anonymous questionnaire in Arabic language was prepared by the investigators and distributed to university students during breaks. Students gave their oral consent to participate to the study, after it had been explained to them that it was a "study done by university researchers that had extreme importance for their health" and ensuring anonymity (no names were required). To ensure maximum objectivity in students' answers, enquirers were instructed not to give any additional clarification for questions that were not understood. The questionnaire was pilot-tested on 30 university students to correct or clarify questions when necessary.

Sample size calculation

Sample size calculation was performed using the following assumptions: a prevalence of harmful alcohol consumption of 9% [11], and worst acceptable values of (6.5%–11.5%) (a bracket of 5% around 9%). The minimal acceptable sample size was calculated to be 503 individuals; taking into account cluster sampling, the number was doubled to 1006. Afterwards, we added an additional number of questionnaires (33%) to allow for non-response. Thus, a total of 1500 questionnaires were distributed to students from all universities.

Study tool

A standardized questionnaire, including closed and open-ended questions, was used. Questions about personal beliefs concerning alcohol consumption and peers' behaviours and opinions were asked. For example, we asked whether students believed that alcohol drinking was dangerous for health, if alcohol was dangerous when consumed frequently and massively, if alcohol was dangerous for pregnant women and if driving after a drink was dangerous. We also asked about the attitudes of their friends towards alcohol consumption and personal attitudes towards drinking, heavy drinking and causes of alcohol consumption or non-consumption. To study practices, we evaluated details of alcohol consumption, age of first and

of regular consumption, place of first alcohol consumption, frequency of high consumption, maximal number of drinks on one occasion, proportion of friends who frequently drink alcohol and frequency of alcohol consumption with friends.

To assess harmful alcohol consumption, we used the AUDIT score recommended by the World Health Organization [12,13]. The score questions were translated into Arabic by an independent translator and back-translated into English by the researchers to resolve any translation discrepancy. A cut-off value of 8 was considered predictive of harmful drinking [12–14].

Statistical analysis

Data was entered, managed and analysed by *SPSS*, version 13.0. Before proceeding with the analysis, we first validated the AUDIT score in the context where it was used: we first performed an exploratory factor analysis using the principal component analysis technique, and extracted the factors with an eigenvalue that was higher than 1, after ensuring sampling adequacy by Kaiser–Meyer–Olkin measure and Bartlett test of sphericity. Since the extracted factors were correlated, we used the Promax rotation to show the most appropriate pattern and structure matrix. We also calculated the Cronbach alpha factor for reliability analysis.

We also weighted the result to adjust for the distribution of students between public and private universities according to the list provided by the Ministry of Education. Harmful alcohol drinking according to the AUDIT score was considered as a dependent variable. The independent variables were as follows: age, type of university, religion, sex, age of initiation of alcohol consumption, age of first alcohol consumption and region of residence. In addition, personal and peers' beliefs and attitudes about alcohol were used as independent variables.

Missing values, which accounted for < 5% of answers, were not replaced, and variables were analysed as available. The chi-squared test was used for comparison between categorical variables. The Student *t*-test was used to compare means of continuous variables. Variables showing association in the bivariate analysis at the $P < 0.2$ level were entered in the multivariate logistic regression models. In the logistic regression a non-significant Hosmer and Lemeshow test should be obtained (P-value > 0.05) to have an adequacy model.

Results

Out of 1500 distributed questionnaires, 1263 individuals (84.2%) returned their questionnaires. After weighting individuals according to the distribution of public and private universities, the number became 1266 individuals (due to numbers rounding). Out of these, 1235 (97.6%) had no missing values and were thus used for the majority of analyses.

AUDIT score validity

Table 1 shows the structure of the AUDIT score when applied to the university students in Lebanon with no missing values, after ensuring sampling adequacy with Kaiser–Meyer–Olkin measure of 0.872, and a Bartlett test of sphericity with a chi-square of 4052 and a P-value < 0.001. When using a principal component analysis and a promax rotation, the AUDIT score items loaded on 2 factors (with eigenvalues > 1) that explained 53.7% of the total variance: the factor represented problems with drinking last year, while the second

Table 1 Construct structure of the AUDIT score for problem drinking among university students in Lebanon

Items	Factor 1 loading	Factor 2 loading	Communality
Frequency of feeling a morning urge to drink in previous 12 months	0.753	–	0.433
Unable to stop drinking in previous 12 months	0.681	–	0.554
Unable to remember what happened after drinking in previous 12 months	0.677	–	0.591
Frequency of guilt after drinking in previous 12 months	0.641	–	0.443
Any person who was hurt in consequence of your alcohol consumption in previous 12 months	0.633	–	0.316
Unable to perform usual activities because of alcohol consumption in previous 12 months	0.549	–	0.481
Did anybody suggest to you that you should decrease your alcohol consumption?	0.451	–	0.371
Frequency of consumption of 6 drinks and more on one occasion	–	0.913	0.790
Mean number of drinks on one occasion	–	0.903	0.759
Usual frequency of alcohol consumption	–	0.813	0.631
Total AUDIT score correlation	0.842*	0.862*	0.552**

**P < 0.001 for Pearson coefficients correlation with AUDIT score; **P < 0.001 for Pearson coefficients correlation between factor 1 and factor 2.*
The reliability of the total AUDIT score and of both factors was 0.815 for the total, 0.734 for factor 1 and 0.803 for factor 2.

mostly represented the frequency and heaviness of alcohol consumption. The reliability of the total AUDIT score and of both factors was high: 0.815 for the total, 0.734 for factor 1 and 0.803 for factor 2.

Sample characteristics

Out of 1235 individuals, 199 (16.1%; 95% CI: 14.0%–18.2%) had an AUDIT score of ≥ 8 and were considered to have harmful drinking. In Table 2, we present the characteristics of the sample, divided into AUDIT scores ≤ 7 (n = 1036; 83.9%) and ≥ 8 (n = 199; 16.1%). There were significant differences concerning alcohol consumption with respect to all the sociodemographic characteristics evaluated: higher age, male sex, Christian religion, attending a private university, studying a non-health specialty and dwelling in Beirut or the Mount Lebanon region were associated with a higher probability of harmful alcohol drinking (P < 0.05 for all) (Table 2).

Personal beliefs and practice concerning alcohol consumption

Believing that alcohol was not dangerous for health (crude OR = 6.67) and thinking that it was acceptable to get drunk sometimes (OR = 5.39), particularly if good grades were achieved at university (OR = 8.21), significantly increased the risk of harmful drinking (P < 0.001) (Table 3). Moreover, knowing that frequent and massive consumption of alcohol was dangerous (OR = 1.42) and that alcohol was dangerous for pregnant women (OR = 1.94) significantly affected the risk of harmful drinking. However, believing that it was dangerous to drink and drive did not have a significant association with harmful drinking (Table 3). The mean age at first consumption was lower in individuals with harmful drinking [13.6 (SD 3.2) versus 15.2 (SD 2.6) years] (P < 0.001) and their mean maximal number of drinks on one occasion was higher [11.0 (SD 6.9) versus 5.3 (SD 6.8)] (P < 0.001).

Peers behaviours and opinion and association with harmful drinking

Table 4 shows that peers' opinion about drinking and behaviours strongly affected the students' risk of harmful drinking. Risk factors for harmful drinking were: friends' agreeing with alcohol consumption (crude OR = 6.22), higher proportion of friends who drank regularly (OR = 17.3) and higher frequency of drinking alcohol with friends (OR = 80.1). Likewise, having had their first drink with friends (OR = 3.27), at a relative's house (OR = 1.81) significantly increased the risk of harmful drinking versus first drinking alcohol in a public place.

Table 2 Sociodemographic characteristics of university students in Lebanon by AUDIT scores for problem drinking

Characteristic	AUDIT score < 8 (n = 1036)		AUDIT score ≥ 8 (n = 199)		P-value	OR (95% CI)
	No.	%	No.	%		
Age group (years)					0.009	
17–19	351	88.0	48	12.0		Ref.
20–21	500	83.2	101	16.8		1.48 (1.00–2.17)
22+	184	79.0	49	21.0		1.95 (1.23–3.08)
Sex					< 0.001	
Male	297	68.1	139	31.9		5.75 (4.13–8.00)
Female	737	92.5	60	7.5		Ref.
Religion					< 0.001	
Christian	821	82.1	179	17.9		2.41 (1.47–3.95)
Muslim	210	91.7	19	8.3		Ref.
Type of university						
Public university	484	90.1	53	9.9	< 0.001	Ref.
Private university	552	79.1	146	20.9		2.41 (1.72–3.38)
Specialty						
Non-health specialty	709	79.7	179	20.3	0.010	4.24 (2.62–6.85)
Health specialty	333	94.3	20	5.7		Ref.
Region of residence					0.003	
Beirut	136	79.5	35	20.5		2.66 (1.26–5.69)
Mount Lebanon	770	83.5	152	16.5		2.04 (1.07–3.98)
Other region	124	91.2	12	8.8		Ref.

Ref. = reference category; OR = odds ratio; CI = confidence interval.

Table 3 **Beliefs concerning alcohol consumption and their association with problem drinking among university students in Lebanon**

Characteristic	AUDIT score < 8 (*n* = 1036)		AUDIT score ≥ 8 (*n* = 199)		*P*-value	OR (95%CI)
	No.	%	No.	%		
Alcohol is always dangerous for health					< 0.001	
No	832	81.3	192	18.8		6.67 (2.91–15.2)
Yes	173	96.6	6	3.4		Ref.
Frequent and massive consumption of alcohol is dangerous					0.052	
No	202	79.5	52	20.5		1.42 (1.00–2.01)
Yes	803	84.6	146	15.4		Ref.
Alcohol is dangerous for pregnant women					< 0.001	
No	527	79.6	135	20.4		1.94 (1.41–2.69)
Yes	478	88.4	63	11.6		Ref.
In general, alcohol is dangerous for health					< 0.001	
Yes	985	85.7	164	14.3		Ref.
No	20	37.0	34	63.0		10.2 (5.74–18.2)
It is dangerous to drink and drive					< 0.001	
Totally disagree	33	73.3	12	26.7		2.98 (1.41–6.23)
Disagree	21	53.8	18	46.2		7.03 (3.45–14.3)
Agree	139	68.1	65	31.9		3.83 (2.63–5.58)
Totally agree	820	89.1	100	10.9		Ref.
It is never good to drink alcohol					< 0.001	
Totally disagree	191	71.8	75	28.2		8.03 (3.76–17.7)
Disagree	423	81.7	95	18.3		2.24 (1.00–5.17)
Agree	215	93.1	16	6.9		1.52 (0.62–3.83)
Totally agree	184	95.3	9	4.7		Ref.
It is OK to get drunk sometimes					< 0.001	
Totally disagree	283	93.1	21	6.9		Ref.
Disagree	288	85.7	48	14.3		2.25 (1.27–3.99)
Agree	305	80.5	74	19.5		3.27 (1.91–5.64)
Totally agree	125	71.4	50	28.6		5.39 (3.01–9.72)
It is OK to get drunk sometimes if we have good academic results					< 0.001	
Totally disagree	495	92.2	42	7.8		Ref.
Disagree	324	83.1	66	16.9		2.40 (1.56–3.70)
Agree	131	73.6	47	26.4		4.23 (2.61–6.86)
Totally agree	56	58.9	39	41.1		8.21 (4.75–14.2)
	Mean (SD)		Mean (SD)			
Age of first consumption of alcohol (years)	15.2 (2.6)		13.6 (3.2)		< 0.001	NA
Maximal drinks on 1 occasion (no.)	5.3 (6.8)		11.0 (6.9)		< 0.001	NA

SD = standard deviation; Ref. = reference category; OR = odds ratio; CI = confidence interval; NA = not applicable.

Table 4 Peer opinions and behaviours and their association with problem alcohol drinking among university students in Lebanon

Characteristic	AUDIT score < 8 (*n* = 1036)		AUDIT score ≥ 8 (*n* = 199)		*P* -value	OR (95% CI)
	No.	%	No.	%		
Friends generally agree with alcohol consumption					< 0.001	
Yes, they do	569	78.7	154	21.3		6.22 (2.60–15.9)
They do not care	277	87.9	38	12.1		3.16 (1.24–8.52)
They disagree	138	95.8	6	4.2		Ref.
Frequency of consumption with friends					< 0.001	
Almost every time	68	41.5	96	58.5		80.1 (27.1–266)
Almost half of the times	112	70.4	47	29.6		23.8 (7.96–79.9)
Less than half of the times	91	91.0	9	9.0		5.61 (1.53–22.3)
Occasionally	476	91.7	43	8.3		5.13 (1.74–17.0)
Never	227	98.3	4	1.7		Ref.
Proportion of friends who drink regularly					< 0.001	
Almost all	134	60.1	89	39.9		17.3 (7.79–39.8)
More than half of them	162	74.7	55	25.3		8.83 (3.92–20.7)
Less than half of them	155	89.6	18	10.4		3.02 (1.20–7.79)
A few of them only	317	93.0	24	7.0		1.97 (0.82–4.86)
None of them	208	96.3	8	3.7		Ref.
Place of first consumption of alcohol					< 0.001	
At home	319	79.8	81	20.3		1.36 (0.92–2.02)
At a relative's house	71	74.7	24	25.3		1.81 (1.01–3.23)
At a friend's house	59	62.1	36	37.9		3.27 (1.92–5.59)
At school	4	80.0	1	20.0		1.34 (0.68–1.64)
In a public place	295	84.3	55	15.7		Ref.

Ref. = reference category; OR = odds ratio; CI = confidence interval.

Multivariate analysis

A stepwise descendent logistic regression was conducted (Table 5), and the following factors had an effect on harmful drinking: male sex (adjusted OR = 2.36), believing that frequent and massive consumption of alcohol was dangerous (OR = 2.94), believing that youngsters agreed with drinking (OR = 1.43; trend towards significance), higher frequency of consuming alcohol with friends (OR = 1.71) and a higher proportion of friends who drank alcohol regularly (OR = 1.38). Other included variables in the model were removed by the procedure because of non-significant associations.

Discussion

We found that the AUDIT score had excellent construct validity and reliability in this sample of Lebanese students. Equivalent results were found by other researchers [15]. An important percentage of students (16.1%) were found to have harmful alcohol consumption (AUDIT score ≥ 8). This proportion is higher than that recently reported by Karam et al. in a rapid situation assessment for alcohol dependence in Lebanon (9%) [11]. This may be due to the fact that harmful alcohol drinking includes the concepts of both alcohol dependence and binge drinking. However, our results were similar to those found by the same authors in the 1990s on a sample taken from 2 private universities [16], where non-Christians and women were less likely to consume alcohol than Christians and men. Prohibition of alcohol consumption by Islam explains the higher number of students with harmful drinking in the Christian category than the Muslim one (OR = 3.17).

Our results are comparable to those of a study of college students in the United States of America, many European countries and the Far East (Hong Kong), except for the sex ratio of consumers who had harmful drinking

Table 5 Multivariate analysis of factors associated with problem drinking among university students in Lebanon

Factor	ORa	95% CI	*P*-value[a]
Male sex	2.36	1.52–3.66	< 0.001
Believing that frequent and massive consumption of alcohol is dangerous	2.94	1.59–5.44	< 0.001
Believing that friends agree with drinking	1.43	0.95–2.15	0.083
Higher frequency of alcohol consumption with friends	1.71	1.43–2.06	< 0.001
Higher number of friends who drink regularly	1.38	1.15–1.66	< 0.001

[a]Hosmer–Lemeshow P-value = 0.076; Nagelkerke R^2 = 0.298. Factors removed from the model because of non-significant association were: age, religion, region of residence, type of university, health specialty, believing that alcohol is dangerous for health and for pregnant women, age at first consumption, place of first consumption, believing that it is acceptable to get drunk from time to time and believing that it is dangerous to drink and drive.
ORa = adjusted odds ratio; CI = confidence interval.

patterns. In Western societies as many females as males consumed alcohol [1], whereas in Lebanon more males than females were found to be at risk. The explanation for this discrepancy could be the fact in our more conservative society [10] fewer females than males are used to drinking on a regular basis. This difference between men and women was demonstrated in a recent worldwide cross-national comparison [17]. However, Karam et al. found that alcohol consumption among women was increasing and that once they became an ever-alcohol consumer, religion did not affect alcohol dependence [16]. Belief in God and religious practice *per se* seemed a protective factor against alcohol use disorders in Lebanese students [18].

Higher age (20–22 years) was accompanied by a higher rate of harmful alcohol drinking than the lower age category (17–19 years). This is probably due to greater independence from society's rules in advanced college years than when freshly graduated from high school. It could also reflect the time period to acquire the habit of drinking alcohol during the years of university education. As for the type of university, the annual costs of private universities are many-fold higher than the public Lebanese University. The majority of private university students belong to a higher socioeconomic status, which is reflected in a way of living full of social gatherings between relatives and friends with many occasions for drinking alcohol. Thus, the rate of harmful alcohol consumption was higher in private universities. Concerning the region of residence, students living in Beirut and Mount Lebanon were more likely to have an AUDIT score ≥ 8 and this is probably due to their higher socioeconomic status as well as the greater number of restaurants, pubs and clubs offering alcohol in those regions. However, all of these factors (age, region, age and religious beliefs) could not on their own explain the difference between students' harmful drinking; they were actually confounded by other factors of knowledge and peers' influence in the multivariate analysis.

An interesting finding was that personal beliefs about alcohol drinking had a significant but limited effect on the risk of harmful drinking; all beliefs that showed a significant effect on bivariate analysis seemed to be confounded by peers' opinion about alcohol, peers' drinking habits and knowledge about alcohol effects. Although both knowledge about alcohol effects and the influence of peers are important, the former seemed to have a limited effect on harmful drinking in our study. As students of health specialties would be expected to be aware of the dangers of alcohol, it is not surprising that the results showed that they were less prone to harmful alcohol drinking. This result was also apparent in the multivariate analysis. In fact, the regression analysis of factors associated with harmful drinking eliminated many factors within the personal beliefs category from the model, which means that personal beliefs had a limited effect on the risk of harmful drinking. Nevertheless, believing that frequent and massive consumption of alcohol was dangerous remained a significant risk factor with an adjusted OR of 2.94.

As for peers' opinion and behaviours, they seem to be the major driving force for harmful drinking of youth; many factors showed significant associations with harmful alcohol drinking, such as believing that their friends agreed with drinking, higher frequency of alcohol consumption with friends and higher number of friends who drink on a regular basis. Those factors had the highest explanatory ratio of the dependent variable variance; they contributed to a higher alcohol level among consumers, thus leading to possible dangerous social and health outcomes. This concept has been demonstrated by others, such as Song et al. [19], Trucco et al. [20], and van der Zwaluw et al. [21]. Our study highlights the need for the introduction of peer education about alcohol consumption and its dangers in all Lebanese universities; a similar activity was initiated among Lebanese/Armenian people to prevent substance abuse [22]. We suggest it could be generalized to other young Lebanese as well.

We are aware of the limitations of this study: a selection bias is possible since the sample was not randomly chosen and an information bias is possible, particularly given the delicate nature of the subject. Moreover, to keep the questionnaire simple we did not define

the terms "frequent" and "massive" consumption in the questions, as our objective was simply to gain an idea about personal beliefs rather than make a formal evaluation. Thus, our results could be overestimating or underestimating the prevalence of alcohol consumption or harmful drinking and its associated factors; however, these biases would be non-differential and the associations found would only be directed towards the null. Additional studies would be necessary to further refine these results in the Lebanese youth population.

In conclusion, harmful alcohol drinking was common among university students in Lebanon and was mainly affected by peers' opinions and behaviours. Interventions are needed to help reduce this significant rate of regular alcohol consuming among students in our country and the danger of massive consumption, especially during gatherings of friends.

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Factors influencing women's willingness to volunteer in the healthcare system: evidence from the Islamic Republic of Iran

A. Alami,[1,2] S. Nedjat,[2,3] R. Majdzadeh,[2,3] A. Rahimi Foroushani,[2] S.J. Hoseini[4] and H. Malekafzali[2]

العوامل التي تؤثر على رغبة النساء للتطوع في النظام الصحي: بيِّنات من جمهورية إيران الإسلامية

على عالمى، سحرناز نجات، رضا مجدزاده، عباس رحيمي فروشاني، سيد جواد حسيني، حسين ملک افضلى

الخلاصة: تقدم هذه الدراسة للحالات والشواهد تقييماً للعوامل التي تؤثر على تطوع النساء في برنامج التطوع الصحي النسائي في جمهورية إيران الإسلامية، وهو برنامج ينفَّذ في 150 مركزاً في ولاية خراسان – ي رضوي. وقد شملت الدراسة 291 إمرأة (145 متطوعة و146 شاهدة) من تلك المراكز. وجمع الباحثون البيانات باستخدام استبيان. وقام الباحثون بتحليل التحوُّف اللوجيستي الوحيد المتغيرات والمتعدد؛ ووجدوا ترابطاً يُعْتَدُّ به إحصائياً ($0.05>P$) بين ميل النساء للتطوع وبين حجم الأسرة، ووجود طفل دون السنتين من العمر في الأسرة، والعلاقة الوثيقة مع الجيران، وتكوين الشبكة الاجتماعية، والدعم العاطفي، والدعم بالمشورة. ولابُدّ من تأسيس البنى التحتية ذات الصلة بالرغبة بالتطوع بين أفراد المجتمع إذا أردنا تعزيز ذلك. ويمكن لإنشاء بعض الأماكن المناسبة من قبيل "منازل الجِوَار"، أن تساهم في زيادة الرغبة في الانضمام إلى هذه البرامج التشاركية.

ABSTRACT This case–control study evaluated the factors influencing volunteering in the Islamic Republic of Iran's Women's Health Volunteer (WHV) programme, which is implemented in 150 centres in Khorasan-e-Razavi Province. We recruited 145 cases (volunteers) and 146 controls (non-volunteers) from the centres. Data were collected by questionnaire. Sociodemographic variables included were: length of residence in neighbourhood, number of siblings, husband's age and education and job, family size, quality of life, self-rated health status, neighbourhood intimacy, child under 2 years, house ownership, wealth index. Social network variables included were: ego network size, type of acquaintance, intimacy with others, relationship communication, relationship duration, emotional support, advisory support, monetary support, physical support, time support. There were significant associations ($P < 0.05$) between women's propensity to volunteer and family size, presence of a child under 2 years in the family, neighbourhood intimacy, social network composition, and emotional and advisory support.

Facteurs influençant l'intention des femmes à devenir volontaires dans le système de soins de santé : données provenant de la République islamique d'Iran

RÉSUMÉ La présente étude cas-témoin a évalué les facteurs influençant le volontariat dans le programme Femmes volontaires de la santé en République islamique d'Iran, mis en œuvre dans 150 centres de la province du Khorassan-Razavi. Nous avons recruté 145 cas (participation volontaire) et 146 témoins (participation sollicitée) dans ces centres. Des données ont été recueillies par questionnaire. Les variables sociodémographiques prises en compte étaient les suivantes : la durée de résidence dans le voisinage, le nombre de frères et sœurs, l'âge du mari, son niveau d'études et son emploi, la taille de la famille, la qualité de vie, l'état de santé auto-évalué, le degré de connaissance du voisinage, la présence ou non d'un enfant de moins de deux ans dans la famille, le fait d'être propriétaire de son logement et l'indice de richesse. Les variables des réseaux sociaux prises en compte étaient les suivantes : la taille du réseau égocentré, le type de connaissance, le degré d'intimité avec les autres, la communication relationnelle, la durée des relations, le soutien psychologique, l'appui consultatif, le soutien financier, le soutien physique et le soutien à la personne. Des corrélations significatives ($P < 0,05$) ont été trouvées entre la propension des femmes à devenir volontaires et la taille de la famille, la présence ou non d'un enfant de moins de deux ans, le degré de connaissance du voisinage, la composition du réseau social, et le soutien psychologique et consultatif.

[1]School of Public Health, Social Development and Health Promotion Research Centre, Gonabad University of Medical Sciences, Gonabad, Khorasan Razavi, Islamic Republic of Iran. [2]Department of Epidemiology and Biostatistics, School of Public Health; [3]Knowledge Utilization Research Centre, Tehran University of Medical Sciences, Tehran, Islamic Republic of Iran (Correspondence to S. Nedjat: nejatsan@tums.ac.ir). [4]Health Centre of Khorasan-e-Razavi Province, Mashad University of Medical Sciences, Mashad, Islamic Republic of Iran.

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Introduction

Participation and volunteering

Since the World Health Organization's "Health for All" Strategy was devised in 1979, participation has been considered a subject central to health. The important role of participation in health promotion strategies was re-emphasized in the "Ottawa Charter for Health Promotion" in 1986 [1]. Participation may be defined as "a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change" [2].

Volunteering would also be one of the important components of social capital at the level of community [3]. Jenner [4] defines a volunteer as "a person who, out of free will and without wages, works for a not-for-profit organization which is formally organized and has as its purpose service to someone or something other than its membership".

The Women's Health Volunteer programme

Although most volunteers give their efforts to non-profit organizations, a noticeable proportion of all volunteer activity is directed to the public sector [5]. The Women's Health Volunteer (WHV) programme, as government-based voluntary action, is a national plan which was launched in some urban parts of the Islamic Republic of Iran in 1990–1991. This community-based health programme has gradually been expanded to all the urban parts of the country [6]. The WHVs (*rabetin-e-behdashti* in Farsi) are women who voluntarily participate in community health-based programmes. There is evidence that WHV activities could have positive effects on community health [6,7]. Therefore, we selected this programme to study, as a successful programme in the context of people's engagement with community health-based programmes.

Influencing factors on individuals' willingness to volunteer

There are various factors, such as personal, family, and local characteristics, that could influence individuals' willingness to volunteer. Recently, researchers have paid particular attention to the influence of social network characteristics on personal decisions. Indeed, it is believed that social networks are central to various social processes affecting health-related behaviours [8]. A social network is a set of actors who may have relationships with one another [9]. Tindall and Wellman also define social network as "the study of social structure and its effects" [10].

Social network characteristics may be stratified in 3 dimensions. The first dimension is structural characteristics (size, density and network composition). The second is interaction characteristics (relation type, contact frequency, relation permanency, and intimacy with network members which is evaluated by closeness sensation of subject with network members). The third dimension is functional characteristics (various types of support consisting of emotional, advisory, monetary, physical, and time support) [11,12]. Individuals can obtain different types of support from their network members. Relatives, friends, and neighbours as well as colleagues can be important resources to offer help and support. It is believed that diverse connections could create various types of social support for each person. It is also supposed that the more diverse connections in one's personal social network, the better one's access to a widespread range of different types of support [12].

In the Islamic Republic of Iran, although a number of studies have been carried out concerning the sociodemographic factors of WHVs as well as the influence of their activities on community health [7,13], less attention has been paid to the effect of contextual factors on volunteering. The impact of sociodemographic and social network characteristics on individuals' decisions to volunteer would still be a fruitful field for exploration.

This study was conducted to assess the relationship between sociodemographic and social network characteristics, and women's willingness to participate with Iran's WHV programme.

Methods

Sampling and study population

We conducted this case–control study in 2010 in Korasan-e-Razavi Province, one of the largest and most populous provinces in the country. It has roughly 5.5 million inhabitants (about 7% of the Iranian population). To select the samples, we restricted the selection process by some potential confounding variables: age, education level, marital status and job. Our research population was married women who were housewives, aged 15–49 years, with an education of between 6 and 12 years, living in urban parts of the province.

To calculate the required sample size, we first conducted a pilot study on 20 individuals from the population. From this we identified the potential problems of the data collection phase and to determine P_1 and P_2. We then used the equation below to estimate the sample size for each group:

$$n = [2(Z_{1-\alpha/2} + Z_{1-\beta})^2 P(1-P)]/(P_1 - P_2)$$

Where $P = (P_1 + P_2)/2$ and considering $Z_{1-\alpha/2} = 1.96$ and $Z_{1-\beta} = 0.84$ (i.e. a power of 0.80), we calculated different sample sizes ranging from 62 to 96 samples in each group. As we applied a 2-stage cluster sampling method to select the samples, we considered

the design effect equal to 1.5. So, our sample size was estimated at 145 samples in each of the case and the control groups. To control potential problems during data gathering, the researchers increased the sample size to 150 participants for each group.

There are nearly 175 urban health centres in Khorasan-e-Razavi province. The WHV programme is actively implemented among 150 centres. To select the participants, we randomly selected 50 of these centres as clusters and administered questionnaires to 3 women as cases in each cluster. All the respondents were women who had recently volunteered for participation in the WHV programme in the selected centres during the research period, 1 May 2010 to 1 September 2010.

In the Islamic Republic of Iran nearly all family members, including women, are registered in family health dossiers which are kept in the urban health centres. After data gathering for the cases, we randomly selected 3 controls in each of the centres among women who did not participate in the WHV programme and had not previously had any cooperation with similar programmes. The questionnaires then were administered via face-to-face interview.

There were 50 interviewers in our study. To assure quality and eliminate potential interviewer bias, a 1-day workshop was held for the interviewers. Additionally, an interview guide was made to use in the process of interviewing. The researchers also used a coding system for the questionnaires to control potential bias in both data entry and analysis and to ensure anonymity for the participants.

Data collection tool

We used a 2-section questionnaire to collect data. Internal consistency was assessed using Cronbach's alpha (0.73 in the social network characteristics domain). Reliability of the questionnaire was assessed via test–retest with a mean intra-class correlation coefficient of 0.82 (0.74–1.00).

The first section of the questionnaire covered sociodemographic characteristics including length of residence in her neighbourhood, the age and education level of the respondent and her husband, husband's job, and family size. We also collected data on other factors including presence of a child under 2years old in the family, and home ownership. To evaluate the family wealth index, we used a list of assets such as vacuum cleaner, washing machine, dishwasher, telephone line, motor car, computer, refrigerator, colour television, and CD or DVD player. We then measured family wealth index via principle component analysis. In the final part of this section, we used a 5-point Likert-range question to assess quality of life and self-rated health status as well as a 7-point Likert-range question to evaluate neighbourhood intimacy as perceived by the respondent.

The second section of the questionnaire was allocated to individual social network factors comprising the structural, interactional and functional characteristics. The structural factors were size, density and network composition. Interactional characteristics consisted of relation type, contact frequency, relation permanency, and intimacy with network members. In this study, 5 types of support—emotional, advisory, monetary, physical, and time support—were considered social network functional characteristics.

Data analysis

We entered the data into *Stata*, version 10. We evaluated differences between case and control groups via the Mann–Whitney U-test, χ^2 and Fisher exact test. Using univariate and multiple logistic regression with odds ratio (OR), *P*-value and 95% confidence interval. We assessed the association between volunteering and sociodemographic as well as social network characteristics. All independent variables were entered separately in the univariate logistic regression model. Then, as Jewell indicated, those variables with $P < 0.2$ were selected for entering in multiple logistic regression [14]. In the final model, variables with $P < 0.05$ were reported as statistically significant.

Ethical considerations

The researchers obtained the approval of the institutional review board of Tehran University of Medical Sciences. Before conducting the research, the research team obtained the authority of managers in regard to the research project. Agreement of all participants to participate the research was obtained before the interviews. As the interviews were prolonged (roughly 1 hour), respondents were offered rest breaks. The respondents were informed of their rights to cease their participation at any time during the interview.

Results

For the data analysis, we used 291 (out of 300) completed questionnaires (cases = 145, controls = 146), a refusal rate of 3%. The mean age in the case group was 28.84 (SD 8.26) years and the duration of education was 10.06 (SD 2.08) years; in the control group the corresponding values were 29.59 (SD 6.9) years and 9.91 (SD 2.07) years, respectively.

Table 1 shows the respondents' sociodemographic characteristics and their associations with participation in the WHV programme. Some sociodemographic factors, including the presence of a child under 2 years ($P = 0.020$), quality of life ($P = 0.018$) and neighbourhood intimacy ($P = 0.002$), had $P < 0.05$ in univariate logistic regression.

Table 2 shows the social network characteristics and their associations with volunteering. Social network

Table 1 Binary logistic regression analysis of sociodemographic characteristics in association with participation in the Women's Health Volunteer programme

Variable	Case (n = 145)		Control (n = 146)		Crude OR	*P*-value	95% CI
	Mean (SD)		Mean (SD)				
Length of residence in neighbourhood (months)	99.57 (92.61)		86.10 (93.52)		1.00	0.342	0.99–1.00
No. of siblings	5.02 (2.34)		4.92 (2.06)		1.07	0.277	0.95–1.20
Husband's age (years)	33.54 (8.74)		34.17 (7.73)		0.99	0.870	0.97–1.03
Husband's education (years)	9.76 (3.02)		9.31 (3.58)		1.02	0.767	0.94–1.11
Family size	3.37* (1.20)		3.62* (1.13)		0.83[a]	0.100	0.66–1.04
Quality of life	3.88* (0.67)		3.66* (0.69)		1.60[a]	0.018	1.09–2.37
Self-rated health status	3.91 (0.64)		3.84 (0.70)		1.17	0.389	0.82–1.68
Neighbourhood intimacy	4.30* (1.34)		3.68* (1.39)		1.40[a]	0.002	1.14–1.72
	No.	%	No.	%			
Husband's job							
Governmental	22	16	23	16	1.00	0.902	0.50–2.20
Free market	84	61	92	63	1.05	0.779	0.27–5.63
Retired	4	34	5	3	1.24	0.655	0.18–2.96
Private office	6		6	4	0.73	0.663	0.48–3.21
Worker	20	14	18	12	1.24	0.840	0.16–9.90
Unemployed	2	2	2	2	1.24		
Child under 2 years							
Yes	20	14	47	32	1.00[a]	0.020	0.21–0.88
No	125	86*	99	68*	0.43[a]		
House ownership							
Owner	63	44	55	38	1.00	0.689	0.50–1.58
Tenant	57	39	72 (	49	0.89	0.492	0.60–2.87
Other	25	17	19	13	1.31		
Wealth index							
1 (poorest)	34	23	27	19	1.00	0.509	0.29–1.85
2	30	21	27	19	0.73[a]	0.844	0.45–1.91
3	28	19	27	19	0.93[a]	0.089	0.20–1.12
4	27	19	30	21	0.47[a]	0.181	0.29–1.27
5 (richest)	26	18	31	22	0.60[a]		

**P < 0.05 (Mann–Whitney U-test, χ^2 test, Fisher's exact test).*
[a]Variables with P < 0.2 and considered for multiple logistic regression.
OR = odds ratio; CI = confidence interval.

density (P = 0.012) and heterogeneity (P < 0.001), women's intimacy with their network members (P < 0.001) and emotional (P < 0.001) as well as advisory (P < 0.001) support obtained from network members also had P < 0.05 in the univariate model. We therefore entered these variables, together with those which had P < 0.20 (i.e. wealth index and family size), in the multiple logistic regression analysis.

The results of the multiple logistic regression analysis are shown in Table 3. There were significant associations between volunteering and some sociodemographic factors including presence of a child under 2 years [adjusted OR (AOR) = 0.46], family size (AOR = 0.76) and neighbourhood intimacy (AOR = 1.31) and some social network characteristics including type of acquaintance (which implies social network heterogeneity) (AOR = 0.60) and emotional support obtained. We compared no support (level 1) with a little support (level 2) conditions (AOR = 1.80), no support with enough support (level 3) conditions (AOR = 1.82) for emotional support obtained, as well as advisory support obtained in comparison with no support to a little support conditions (AOR = 1.48) and no support to enough support conditions (AOR = 2.13).

Table 2 Binary logistic regression of social network characteristics of Women's Health Volunteer programme volunteers and controls

Variable	Volunteers (*n* = 145)	Controls (*n* = 146)	Crude OR	*P*-value	95% CI
Social network domain: structural					
Ego network size [mean (SD)]	12.79(7.43)	12.99 (5.62)	1.02	0.294	0.99–1.05
Density [mean (SD)]	0.64 (0.18)	0.70 (0.18)	0.13a	0.012	0.03–0.64
Type of acquaintance [No. (%)]					
Non-relative	457 (27)	264(15)	1.00		
Relative	1257 (73)*	1499 (85) *	0.48a	< 0.001	0.38–0.62
Social network domain: interactional					
Intimacy with others [mean (SD)]	3.99*(1.21)	3.70*(1.34)	1.19a	< 0.001	1.06–1.34
No. of contacts [No. (%)]					
> once a week	898 (53)	921 (53)	1.00		
once a week	342 (20)*	372 (21)*	0.94	0.646	0.73–1.21
once in 2 weeks	157 (9)*	87 (11)*	0.86	0.487	0.57–1.31
< once in 2 weeks	306 (18)*	273 (15)*	1.15	0.414	0.82–1.61
Relationship [No. (%)]					
Visual	1246(75)	1374 (79)	1.00		
By telephone	396 (24)*	365 (21)*	1.20	0.244	0.89–1.62
By mail	7 (0)*	4 (0)*	1.93	0.424	0.39–9.67
Other	10 (1)*	6(0)*	1.84	0.345	0.52–6.49
Relationship duration (months) [mean (SD)]	203.94 (143.49)	196.87 (134.52)	1.00	0.505	0.99–1.00
Social network domain: functional					
Emotional support [No. (%)]					
None	170 (10)	401 (23)	1.00		
A little	631 (37)*	680 (38)*	2.19a	< 0.001	1.58–3.03
Enough	913 (53)*	680 (39)*	3.17a	< 0.001	2.20–4-56
Advisory support [No. (%)]					
None	294 (17)	562 (32)	1.00		
A little	656 (38)*	678 (39)*	1.85a	< 0.001	1.45–2.36
Enough	762 (45)*	518 (29)*	2.81a	< 0.001	2.09–3.78
Monetary support [No. (%)]					
None	931 (54)	962 (55)	1.00		
A little	399 (23)	359 (20)	1.15	0.409	0.83–1.60
Enough	379 (22)	431 (25)	0.91	0.550	0.66–1.24
Physical support [No. (%)]					
None	583 (34)	639 (37)	1.00		
A little	614 (36)	606 (35)	1.11	0.504	0.81–1.52
Enough	493 (30)	496 (28)	1.09	0.599	0.79–1.51
Time support [No. (%)]					
None	542 (32)	614 (35)	1.00		
A little	644 (38)	638 (36)	1.14	0.344	0.87–1.51
Enough	515 (30)	496 (29)	1.18	0.316	0.86–1.62

**P < 0.05 ((Mann–Whitney U test, χ^2 test, Fisher's exact test).*
[a]P < 0.2 and considered for multiple logistic regression,
OR = odds ratio; CI = confidence interval.
SD = standard deviation.

Table 3 Multiple logistic regression of sociodemographic and social network characteristics associated with participation in the Women's Health Volunteer programme

Variable	Adjusted OR	*P*-value	95% CI
Family size	0.76	0.027	0.60–0.97
Quality of life	1.41	0.108	0.93–2.14
Neighbourhood intimacy	1.31	0.018	1.05–1.64
Density	0.17	0.075	0.026–1.19
Child under 2 years			
No	1.00		
Yes	0.46	0.037	0.22–0.96
Wealth index quintile			
1 (poorest)	1.00		
2	0.66	0.382	0.26–1.68
3	0.94	0.884	0.41–2.15
4	0.44	0.123	0.16–1.25
5 (richest)	0.79	0.588	0.34–1.84
Type of acquaintance			
Non-relative	1.00		
Relative	0.60	< 0.001	0.47–0.77
Intimacy with others	1.01	0.875	0.90–1.13
Emotional support			
None	1.00		
A little	1.80	< 0.001	1.31–2.46
Enough	1.82	0.003	1.22–2.72
Advisory support			
None	1.00		
A little	1.48	0.007	1.11–1.96
Enough	2.13	< 0.001	1.52–2.99

OR = odds ratio; CI = confidence interval.

Discussion

To the best of our knowledge, this is the first study conducted in Iran that deals with the association between sociodemographic and social network factors and willingness to participate in a voluntary programme. By recognizing these potential associations, a new view could be created to improve such programmes.

Multiple logistic regression analysis indicated that neighbourhood intimacy and the emotional and advisory support obtained from network members may have a direct association with willingness to volunteer in the WHV programme, while presence of a child under 2 years in the family, family size and network homogeneity may have an inverse association. We found no significant associations between certain sociodemographic variables and social network characteristics and participation in the WHV programme.

Arguments and counterarguments

Family size was an influencing variable on volunteering. The smaller the family size, the more likely respondents were to participate in the WHV programme. As these women may have more time to participate in social activities, this would be logical. Nesbit also suggested that middle-aged women with larger family size have less time to engage in voluntary activities [15].

There was a significant association between presence in the family of a child under 2 years and volunteering. This is similar to the findings of Gomez and Gunderson who reported an association between the existence of a dependent child in the family and volunteering [16]. There was also a significant association between neighbourhood intimacy and volunteering in our research. Poley and Stephenson indicated strategies which develop common interests in their neighbourhood could have positive effects on neighbourhood members' civic engagement [17].

We found the number of non-relative members (friends and neighbours) in the social networks of volunteers was statistically significantly greater than in the social networks of the control group. In fact, the social networks in the volunteers were more heterogeneous than those of the controls. Diversity in

their personal social network may imply that an individual is more communicative, and this may be a predictor of willingness to volunteer. Our finding was similar to those of Wilson and Musick, which showed a direct association between number of friends and voluntary activity [18].

Our results showed a significant association between the emotional and advisory support, as personal social network resources, and willingness to volunteer in the WHV programme. It was comparable with the results of the study of Tong, Hung and Yeun in Macao, which was conducted to recognize the determinants and effects of social network characteristics on pro-social behaviours such as volunteering and helping others [19]. They emphasized those individuals who have resourceful social networks have more willingness to participate in such pro-social activities.

In contrast, in our study, there was no significant association between social network size and willingness to volunteer. In the study carried out by Tong, Hung and Yeun, social network size may have had a direct association with personal willingness to help others and volunteering. As their study could not investigate temporality between exposure (social network size) and outcome (volunteering), the network size may itself be influenced by volunteering. As we used incident cases, there was no similar problem in our study.

There was no significant association between wealth status of the participants and volunteering in our study. In contrast, Goss implied that wealthy people are more willing to donate their time in voluntary efforts [20].

Although several studies have reported an association between home ownership and volunteering [21,22] we did not find such an association. Insufficient sample size may be a cause of the failure to find this association in our study. Neither did we find a significant association between social network density and volunteering, which was comparable to the results of Rotolo [23], but contrary to those of Kane [24].

Study limitations

Case–control studies are known to have more of a tendency to confounding, information bias and selection bias than other types of study. To control the problem, we restricted the selection of subjects on some variables such as age (15–49 years), duration of education (6–12 years), marital status (married) and job (housewife). We also conducted some activities to improve quality assurance, such as holding a workshop for interviewers and preparing an interview guide. To avoid the effect of volunteering on the factors under study, especially social network characteristics, all the selected cases were new volunteers (incident cases).

We would particularly refer to 2 issues. Although many studies have demonstrated a potential relation between education level and volunteering [25], we could not investigate the association between the variables. This was because of the restriction on this factor in the selection process. Similarly, associations between volunteering and the respondents' age, marital status, and job could not be evaluated in this study. Besides, a woman who is willing to participate in the WHV programme must obtain written agreement from her husband. This behaviour may be a proxy for a more democratic family. So it seems women living in such families may have more chance to participate in social activities such as the WHV programme. Therefore, our results might be influenced by this discrepancy between the volunteer group and the control group. Of course, this association should be investigated through a separate study.

Policy implications

As mentioned, there has been no previous research to identify the characteristic factors of women who have a propensity to participate in the Iranian WHV programme, as a voluntary plan. Our findings can be used by policymakers who work on community-based voluntary programmes, especially in the Islamic Republic of Iran and other countries with similar cultures. According to our findings in regard to the relationship between volunteering and family size as well as the presence of a child under 2 years in the family, we suggest that managers should probably target their attempts at women who have small families, with no dependent children so that they may be able to select appropriate individuals for their voluntary programmes.

We found that the greater the intimacy in the neighbourhood, the greater the chance of a woman being willing to volunteer. To promote a volunteering culture in the community, places such as "neighbourhood houses" (c.f. community centres) or "neighbourhood councils" could be established. Through such places, neighbours could design and generally run public activities, including educational and health/exercise activities. The likelihood of more-communicative persons, i.e. those with a propensity for volunteering, attending such places would be quite high. So, we suggest establishing places such a "neighbourhood house", because of these multi-dimensional effects.

In conclusion, family size, neighbourhood intimacy, individual social network heterogeneity and received emotional and advisory supports from network members may be important determinants of participation in community-based voluntary programmes such as the WHV programme.

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Characterization of wound infections among patients injured during the 2011 Libyan conflict

A.A. Dau,[1] S. Tloba[2] and M.A. Daw[2]

خصائص عدوى الجروح لدى ذوي الإصابات خلال الصراع في ليبيا عام 2011

اغنية ضو، سعاد طلوبة، محمد ضو

الخلاصة: قليلةٌ هي الدراسات التي أجرت تحليلاً للتعرُّف على العوامل المسببة للعدوى في جروح الحرب في إقليم شرق المتوسط. وفي هذه الدراسة حلَّل الباحثون مختلف العَدَاوى في جروح 1200 مصاب في الصراع الذي جرى في ليبيا عام 2011، ممن قُبِلوا في الخدمات الإسعافية في المركز الطبي في طرابلس؛ فجمعوا مسحات أو عينات من أنسجة الجروح وزرعوها للتعرف على المكروبات المسببة، ومقاومتها للأدوية المضادة للمكروبات. ومن بين المرضى الذين أُجريت عليهم الدراسة كان 498 (42٪) مصابين بعدوى عامل مُمرّض واحد، وكان 57 منهم لديهم عدوى بأكثر من عاملَيْن ممرضَيْن. وكانت أكثر الأنواع الـمُمْرضة شيوعاً هي أنواع الرَّواكد (فقد استفردت من 144 مريضاً)، والعنقوديات السلبية الكواغولات (122 مريضاً)، والإشريكية القولونية (107 مرضى)، والزائفة الزنجارية (92 مريضاً) وأنواع الكبسيلات (86 مريضاً). ووجد الباحثون مستوى مرتفعاً من المقاومة للمضادات الحيوية، ولاسيَّما لدى أنواع الرَّوَاكد. وقد كانت العصيات السلبية الغرام المقاومة لأدوية متعددة من المضاعفات الهامة لعدوى الجروح التالية لإصابات الحروب في ليبيا. وتمس الحاجة إلى سياسات فعَّالة لمكافحة ومعالجة هذه العَدَاوى، ولاسيَّما في خدمات الإصابات والإسعافات.

ABSTRACT Few studies have analysed the bacterial pathogenesis of infections associated with war-wound in the Eastern Mediterranean region. We analysed surgical wound infections of 1200 patients injured during the Libyan conflict in 2011 and admitted to the emergency services at Tripoli medical centre. Culture swabs or surgical wound debridement samples were collected and cultures were identified and tested for antimicrobial resistance. Of the 1200 patients studied, 498 (42%) were infected with at least 1 pathogen and 57 with > 2 pathogens. The most common species were *Acinetobacter* spp. (isolated from 144 patients), coagulase-negative staphylococci (122), *Escherichia coli* (107), *Pseudomonas aeruginosa* (92) and *Klebsiella* spp. (86). A high level of resistance to the antibiotics tested was found, especially among *Acinetobacter* spp. Multi-drug-resistant Gram-negative bacilli were an important complicating factor in wound infections associated with war injuries among injured patients in Libya. Effective policies are needed to control and treat such infections particularly in trauma and emergency services.

Caractérisation des infections de plaies chez les patients blessés pendant le conflit libyen en 2011

RÉSUMÉ Peu d'études ont analysé la pathogénèse bactérienne des infections associées aux plaies de guerre dans la Région de la Méditerranée orientale. Nous avons analysé les infections des plaies après un acte chirurgical chez 1200 patients blessés pendant le conflit libyen en 2011 et admis au service des urgences du centre médical de Tripoli. Des prélèvements par écouvillon ou des échantillons du parage des plaies ont été recueillis puis mis en culture pour identification et analyse à la recherche de résistances aux antimicrobiens. Sur l'ensemble des patients dont les plaies ont été étudiées, 498 étaient porteurs d'une infection (42 %) par au moins un agent pathogène, et 57 par plus de deux agents pathogènes. Les espèces les plus courantes étaient *Acintobacter* spp. (isolée chez 144 patients), les staphylocoques à coagulase négative (122), *Escherichia coli* (107), *Pseudomonas areuginosa* (92) et *Klebsiella* spp. (86). Un haut niveau de résistance aux antibiotiques testés a été observé, en particulier pour *Acinetobacter* spp. Les bacilles à Gram-négatif multirésistants représentaient un facteur de complication important pour les infections de plaies associées à des blessures de guerre chez des patients blessés en Libye. Des politiques efficaces sont requises pour lutter contre de telles infections et les traiter, notamment dans les services de traumatologie et des urgences.

[1]Department of Surgery; [2]Department of Medical Microbiology, Faculty of Medicine, Tripoli, Libya (Correspondence to M.A. Daw: mohamedadaw@gmail.com; mohameddaw@gmail.com).

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Introduction

Wound infections during wars cause serious morbidity and mortality and have to be treated with great care, particularly by clinical surgeons, who are often the first to treat such cases. The bacterial features of these infections are well-known and the evolution of such infections and the causative pathogens has attracted much attention [1]. Wounding patterns during wars depend on the intensity of fighting and include gunshot bullet wounds, ulceration of vital structures, cavitations and devitalization of tissues and limb amputations. Management of such injuries is no longer the exclusive preserve of military surgeons. Initial measures for treating war injury are similar to those for any severe injury [2].

Despite the clinical complications associated with war-wound infections few studies have analysed their bacterial pathogenesis in the Eastern Mediterranean region, an area that hosts many conflicts [3]. In this study we aimed to analyse the bacterial patterns of war-trauma-associated infections in patients wounded in the conflicts in Libya in 2011, define the factors associated with such infections and determine the antimicrobial resistance patterns of aerobic multi-drug resistant Gram-negative bacilli.

Methods

Sample

A total of 1200 injured male patients were admitted to the emergency departments in Tripoli medical centre, Tripoli, Libya, in the 9-month period from March to October 2011. Their ages ranged between 20–55 years. They were brought from different regions of Libya including the Novosa mountains (157 patients), Tripoli/Zawiya (398 patients), Bani Walid/Sirte (302 patients), Zlitan/Misrata (236 patients) and other places (107 patients) (Table 1).

Table 1 Clinical and microbiological characteristics of patients with war-trauma injuries during the 2011 conflict in Libya

Variable	No. of patients	% (*n* = 1200)
Anatomical location of wound		
Chest and back	379	32
Abdomen	239	20
Head and neck	202	17
Extremity (upper or lower)	189	16
Loss of limb	93	8
More than 2 locations	98	8
Mechanism of injury of wound		
Gunshot	343	29
Shrapnel	283	24
Blunt instrument	197	16
Blast	171	14
Burn	89	7
Other	117	10
Outcome of wound treatment		
Died in hospital	310	26
Discharged alive	890	74
Bacteriological culture from wound		
Positive	498	42
Negative	702	58
No. of organisms isolated from positive wound cultures		(*n* = 498)
1	293	59
2	148	30
> 2	57	11

Data collection

Data collected from each casualty included the mechanism of injury, its anatomical location, previous medical care and antibiotics used. Clinical specimens, which included culture swabs and samples from any existing wound debridements, were collected from the admitted patients.

Bacterial culture techniques

The specimens were plated onto Columbia blood agar plates, chocolate agar, MacConkey agar plates and into thioglycolate broth. Blood agar and MacConkey agar plates were incubated at 35 °C in ambient air and chocolate agar was incubated in presence of 5% CO_2 at 35 °C. The thioglycolate broth was Gram-stained as it became turbid. Negative culture plates were left for 5 days, after which negative bacterial cultures were discarded. Each bacterial isolate was biochemically identified using the Analytical Profile Index 20 Enterobacteriaceae (bioMérieux) for lactose-fermenting Gram-negative bacilli. Others were identified according the standard microbiological methods established [4].

Antimicrobial susceptibility testing

Antimicrobial susceptibility testing was determined using the Kirby–Bauer disk diffusion test using National Committee for Clinical Laboratory Standards criteria for each bacterial species [5]. The following antibiotic disks were used for penicillins (ampicillin, amoxicillin, ticarcillin and imipenem), cephalosporins (cefazolin, cefotaxime and ceftazidime),

aminoglycosides (gentamicin and amikacin) and miscellaneous (ciprofloxacin and tetracycline) and vancomycin (only for Gram-positive cocci).

Results

Clinical and demographic profile of wounded patients

The wound injuries of 1200 patients who were brought from different area of Libya were classified as combat-related according to internationally recognized criteria [2].

The mechanisms of wound injuries were as follows: gunshot wounds (29%), shrapnel wounds (24%), blunt instrument wounds (16%), blast wounds (14%) and burns (7%) (Table 1). The main anatomical sites of the wounds from which swabs for culture were taken were: chest and back (32%), abdomen (20%), head and neck (17%) and extremities (16%); in 98 patients swabs were taken from more than 2 locations (Table 1). A total of 310 (26%) of these patients admitted with wound infections died in hospital.

Wound infections

Positive bacteriological cultures were obtained from the wounds of 498 (42%) patients. The remaining 702 patients (59%) had negative bacterial cultures and were classified as uninfected. Both infected and non-infected patients had an average age of about 30 years, ranging from 20–55 years, with no significant difference in age between the infected and uninfected patients.

The injured patients were brought from different geographical zones across Libya. Table 2 shows the distribution of wound-infected and uninfected patients according to the battlefield area and type of battle. The greatest number of infected patients were brought from the Tripoli/Zawiya zone (177 patients), followed by Bani Walid/Sirte (105 patients) and Zlitan/Misrata (102 patients). Patients bought from Tripoli/Zawiya had the highest rate of infection (44%) and Bani Walid/Sirte the lowest (35%). The Novosa mountains area had the highest rate of deaths (39%). Patients injured in ground battles (i.e. those were brought from the rebel fighting areas) had a higher rate of infection (43%) than those wounded by airstrikes (i.e. those brought from army compounds where there was no fighting on the ground) (36%) (Table 2).

Organisms cultured and susceptibility patterns

Of the 498 patients with positive bacterial cultures, 293 (59%) had a single organism isolated, 148 (30%) had 2 organisms and 57 (11%) had more than 2 pathogens.

The most common organism cultured from wounded patients was Gram-negative bacilli, which included *Acinetobacter* spp. in 144 patients, *Escherichia coli* from 107 patients, *Pseudomonas* spp. from 92 patients, *Klebsiella* spp. from 86 patients, while other Gram-negative species were cultured from 157 patients. Gram-positive cocci were cultured from 178 patients, mainly coagulase-negative staphylococci isolated from 122 patients, while other Gram-positive bacteria were cultured from 56 patients.

The antimicrobial susceptibility patterns of these organisms are shown in Table 3. *Acinetobacter* spp. were the most resistant pathogen. Other isolated Gram-negative bacteria showed great resistance to 3rd-generation cephalosporins and aminoglycosides, apart from amikacin. However, *P. aeruginosa* was quite susceptible to commonly used antipseudomonal therapy particularly carbapenems. Coagulase-negative staphylococci were found to be sensitive to all the antibiotics tested particularly gentamicin and vancomycin.

Discussion

Wound infections associated with war injuries have changed over the last

Table 2 Characteristics of patients with infections associated with war-trauma injuries during the 2011 conflict in Libya

Variable	Infected (*n* = 498)		Uninfected (*n* = 702)		Died (*n* = 310)		Total (*n* = 1200)
	No.	%	No.	%	No.	%	No.
Battlefield area							
Tripoli/Zawiya	177	44	221	56	93	23	398
Novosa mountains	68	43	89	57	61	39	157
Bani Walid/Sirte	105	35	197	65	79	26	302
Zlitan/Misrata	102	43	134	57	72	31	236
Other places	46	43	61	57	17	16	107
Type of battle							
Ground battles	391	43	508	57	127	14	899
Airforce strikes	107	36	194	64	183	61	301

n = number of patients.

Table 3 Antimicrobial susceptibility profile of pathogens isolated from wounds associated with war-trauma injuries in the 2011 conflict in Libya

Antimicrobials tested	*Escherichia coli* (*n* = 107)		*Klebsiella* spp. (*n* = 86)		*Acinetobacter* spp. (*n* = 144)		*Pseudomonas* spp. (*n* = 92)		Coagulase-negative staphylococci (*n* = 122)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Penicillins										
Ampicillin	25	23	10	12	4	3	–	–	0	0
Oxacillin	–	–	–	–	–	–	–	–	20	16
Ticarcillin	0	0	0	0	0	0	74	80	–	–
Imipenem	107	100	86	100	144	100	90	98	–	–
Cephalosporins										
Cefazolin	45	42	20	23	0	0	0	0	–	–
Cefotaxime	27	25	21	24	9	6	0	0	–	–
Ceftazidime	75	70	73	85	0	0	85	92	–	–
Aminoglycosides										
Gentamicin	47	44	51	59	46	32	47	51	70	57
Amikacin	107	100	63	73	20	14	82	89	–	–
Miscellaneous										
Ciprofloxacin	90	84	80	93	101	70	87	95	50	41
Tetracycline	–	–	–	–	–	–	–	–	115	94
Vancomycin	–	–	–	–	–	–	–	–	120	98

Other Gram-negative bacilli (n = 157 isolates); other Gram-positive bacteria (n = 56).
n = number of isolates tested; zero (0) indicates no bacteria cultures; dash (–) indicates not applicable.

century, not only in the pattern of the causative organisms and the antimicrobials used to tackle such serious infection but also in the physician's approach to handling them. Formerly the bacteriological characterization of war-associated infections was based on the colour of the discharge and the smell of the wound which was associated with anaerobic bacteria particularly *Clostridium* spp. [6]. Such infection was associated with a high rate of morbidity and mortality among the infected individuals. This has changed with the introduction of antibiotics and modern surgical management of wounds. This has resulted in the diminution of Gram-positive bacteria and emergence of more resistant ones particularly the aerobic and facultative anaerobic Gram-negative bacilli [3,7,8]. Our study in Libya showed that the infection rate among patients with war-associated infection was 42% with no variation according to the different regions where the injured patients came from. The infections were mainly caused by multidrug-resistant (MDR) Gram-negative bacilli.

Gunshot wounds result in gross tissue destruction that is an excellent medium for infection. In this study direct gunshot, blast, blunt instrument and shrapnel wounds were the most common injuries. Such results are in agreement with other data collected from war conflicts in Vietnam, Somalia and Iraq [9,10].

MDR Gram-negative bacilli are known to be a major cause of nosocomial infection particularly in wound infections [3,10]. This is more obvious in war situations. However, MDR *P. aeruginosa*, extended-spectrum beta-lactamase-producing *Klebsiella* and *Acinetobacter* spp. were isolated extensively from wound infections during the Iraqi war [4,9]. In the present study, MDR Gram-negative bacilli were the major bacteria associated with wound infections in injured patients in Libya. MDR *Acinetobacter* spp. isolates were the most common pathogen, accounting for 144 of the isolates cultured, followed by *E. coli*, *P. aeruginosa* and *Klebsiella* spp. The incidence of MDR Gram-negative bacilli and their rate of antibiotic resistance were higher in this study compared with similar studies carried in different geographical regions [6,8,11]. This, however, may suggest different ecosystems and bacteria involved in these infections.

Gram-positive bacteria have been known to be involved in wound injury and many studies have reported this [12]. In our study 122 coagulase-negative staphylococci isolates and another 56 miscellaneous Gram-positive bacteria were cultured from the wounded patients and sometimes were found to be co-pathogens with MDR Gram-negative bacilli. All of them were sensitive to all the antimicrobials tested except oxacillin and ampicillin. This may indicate

they were skin-commensal pathogens which are considered to be of low virulence and pathogenicity [13].

The patients in this study were often wounded far from hospital and evacuated under escalating conflict conditions with contaminated wounds and diminished vascular function. Patients with soft tissue injuries and blast, gunshot and burn injuries had open wounds that could easily have been contaminated with soil, dust and contact with the hands of the people who evacuated them. The bacteria may have colonized wounds at the time of injury or as a result of personnel contact during evacuation or inside the hospital. Similar results were reported from other investigators for victims of the tsunami in Bali as well as victims of the Bosnian and Iraqi conflicts [14,15]. This indicates that the source of acquisition of these organisms may be environmental from the battleground or endogenously from the patient him/herself.

The use of antimicrobials in the treatment of surgical wound infections is still disputed. Antibiotics may affect the wound flora and thus enhance the more resistant bacteria. Furthermore, it is not clear which is the most appropriate antimicrobial to use in these circumstances: a narrow-spectrum one that covers a specific type of bacteria or a broad-spectrum one [16]. However, in certain conditions, such as unconscious or shocked patients and abdominal surgery, antibiotics have to be used. The antimicrobial resistance patterns in this study can be used to guide their empirical use in cases of pyrexia, shock or intensive soft tissue injury.

The pathogenicity of the bacteria plays an important role in wound infection, which might be related to the virulence factors of the pathogens themselves or existence of co-pathogens [17]. In this study 59% of the patients had a single pathogen, 30% showed 2 different isolates and 11% showed 3 or more isolates. This may suggest the role of co-pathogens in the development of necrotizing war trauma-related infection, particularly in *Acinetobacter* spp., which has been indicated by other studies [3,18]. Further studies are needed to determine the virulence factors and mechanism of resistance of such pathogens.

Our study focused on Gram-negative bacilli as most of the patients studied had required immediate evacuation and undergone immediate surgical debridement. This was likely to have minimized the role of anaerobic infection in these patients. Furthermore, anaerobic bacteria are uncommonly recognized as a cause of wound war infections except in the Korean war [11]. This highlights the importance of the present study, which is one of the few studies in Arab countries that have documented the patterns of war-wound infections and characterized the causative agents of these injuries. Furthermore, the detection of highly resistant bacteria, such as *Acinetobacter* spp., *P. aeruginosa*, *Klebsiella* spp. and *E. coli*, mandates a change in the management of surgical wounds and infection control measures, as well as specific guidelines for the use of antimicrobials in all hospital settings and emergency trauma services in Libya [3,19,20].

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Prevention and management of wound infection

Open injuries have a potential for serious bacterial wound infections, including gas gangrene and tetanus, and these in turn may lead to long term disabilities, chronic wound or bone infection, and death. Wound infection is particularly of concern when injured patients present late for definitive care, or in disasters where large numbers of injured survivors exceed available trauma care capacity. Appropriate management of injuries is important to reduce the likelihood of wound infections. The document *Prevention and management of wound infection* provides core principles and protocols for appropriate prevention and management of infected wounds.

This document is available at: http://www.who.int/hac/techguidance/tools/guidelines_prevention_and_management_wound_infection.pdf

Relation between some haematological abnormalities, degree of immunosuppression and viral load in treatment-naïve HIV-infected patients

B.A. Denue,[1] W. Gashau,[1] H.S. Bello,[2] I.M. Kida,[1] B. Bakki[1] and B. Ajayi[3]

العلاقة بين بعض الشذوذات الهيماتولوجية، ودرجة الكبت المناعي والحمولة الفيروسية في معالجة المرضى المصابين بعدوى الإيدز ممّن لم يسبق لهم تلقي المعالجة من قبل

بللا أكاوو دينوى، وادزاني غاشو، هـ. س. بيلو، إبرهيم موسى كدا، بكر بككي، باباجيدي أجاي

الخلاصة: قد أجريت هذه الدراسة المستعرضة في مستشفى تعليمي شماليَّ نيجيريا، لتقدير معدل انتشار فقر الدم، وقِلَّة الكريات البيض والصفيحات لدى 177 من الذكور و316 من الإناث المصابين بعدوى الإيدز ممَّن لم يتلقوا معالجة سابقة مضادة لفيروس الإيدز، وتقدير أنواع الترابط مع الواسمات المناعية والفيروسية. واتضح أن المعدل الإجمالي لانتشار فقر الدم 49.5٪، ونقص الصفيحات 4.5٪، وقلة الكريات البيض 5.5٪. وقد كان معدل انتشار فقر الدم أعلى بمقدار يُعتدُّ به إحصائياً لدى الذكور (61.6٪) مما لدى الإناث (42.7٪)، أما معدلات قلّة الكريات البيض فتكاد تكون متماثلة بين الجنسين فهي 5.1٪ عند الذكور و5.7٪ عند الإناث، وكذلك بالنسبة لنقص الصفيحات، فهو 5.7٪ عند الذكور و3.8٪ عند الإناث. وكان لدى ما يقرب من ثلثي المرضى الذين لم يتلقوا المعالجة من قبل، وعددهم 293 مريضاً من أصل 493 (59.4٪) نقص في الخلايا، وكانوا يتطلبون المعالجة المضادة للفيروسات القهقرية. وقد تم تشخيص الإيدز عبر المعايير السريرية والمناعية لدى 70٪ من المرضى. وكانت درجة نقص الخلايا تترابط ترابطاً مباشراً مع درجة الكبت المناعي والوضع السريري للإيدز. ولم تشاهد أي علاقة بين نقص الخلايا وبين الحُمُولة الفيروسية.

ABSTRACT This cross-sectional study at a teaching hospital in north-eastern Nigeria estimated the prevalence of anaemia, leukopenia and thrombocytopenia in treatment-naïve HIV-infected patients (177 males and 316 females), and the associations with virological and immunological markers. The overall prevalences of anaemia, leukopenia and thrombocytopenia were 49.5%, 5.5% and 4.5% respectively. The prevalence of anaemia was significantly higher in males than females (61.6% versus 42.7%), while the rates of leukopenia (5.1% versus 5.7%) and thrombocytopenia (5.7% versus 3.8%) were similar. Almost two-thirds of the HIV treatment-naïve studied patients, 293/493 (59.4%), had cytopenia and would require antiretroviral drugs. AIDS was diagnosed by clinical or immunological criteria in 70% of patients. The degree of cytopenia was directly related to the degree of immunosuppression and clinical AIDS status. No relationship was observed between cytopenia and viral load.

Relation entre des anomalies hématologiques, le degré d'immunosuppression et la charge virale chez des patients infectés par le VIH et n'ayant jamais reçu de traitement

RÉSUMÉ La présente étude transversale menée dans un hôpital universitaire au nord-est du Nigeria a estimé la prévalence de l'anémie, de la leucopénie et de la thrombocytopénie chez des patients infectés par le VIH et n'ayant jamais été traités (177 hommes et 316 femmes), et les associations aux marqueurs virologiques et immunologiques. Les prévalences globales pour l'anémie, la leucopénie et la thrombocytopénie étaient de 49,5 %, 5,5 % et 4,5 %, respectivement. La prévalence de l'anémie était significativement plus élevée chez les hommes que chez les femmes (61,6 % par rapport à 42,7 %), tandis que les taux de leucopénie (5,1 % par rapport 5,7 %) et de thrombocytopénie (5,7 % par rapport à 3,8 %) étaient similaires. Près des deux-tiers des patients de l'étude infectés par le VIH et n'ayant jamais été traités 293/493 (59,4 %) avaient une cytopénie et auraient besoin de médicaments antirétroviraux. Le diagnostic du sida a été posé à partir de critères cliniques ou immunologiques chez 70 % des patients. Le degré de cytopénie était directement lié au degré d'immunosuppression et au stade clinique du sida. Aucun lien n'a été observé entre la cytopénie et la charge virale.

[1]Department of Medicine; [3]Department of Immunology, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria (Correspondence to A Ballah: d_akawu@yahoo.co.uk).
[2]Department of Microbiology, University of Maiduguri, Maiduguri, Borno State, Nigeria.

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Introduction

Haematological abnormalities (anaemia, leukopenia and thrombocytopenia) are common manifestations of advanced HIV-1 infection that could potentially limit the use of some components of antiretroviral therapy (ART) regimens [1,2]. The prevalence of anaemia in patients with HIV infection varies widely by sex and race/ethnicity, with rates ranging from 30% in asymptomatic HIV to as high as 63%–95% in persons with AIDS, depending on the study setting [3–7]. Anaemia is more common than leukopenia and thrombocytopenia in patients with AIDS [5–8]. The prevalence of leukopenia also varies widely in patients with HIV; reported prevalence ranges from 10%–50% [7,8]. Various studies have suggested that the progression of HIV, as measured by deceasing CD4+ cell counts and increasing HIV-RNA levels, is significantly associated with developing neutropenia [6,8,9].

Thrombocytopenia is a possible complication of HIV infection. Its pathogenesis has not yet been established. Possible mechanisms that have been reported are an increased platelet destruction, either caused by the non-specific deposition of circulating immune complexes on platelets or by the presence of specific antiplatelet antibodies, as well as direct infection of megakaryocytes by HIV with a resulting decrease in platelet production [10].

In all cases, a specific diagnosis of the cause, severity and mechanism of cytopenia should be sought, because a specific intervention other than the use of antiretroviral drugs may be indicated for its correction. The use of antiretroviral drugs could positively or negatively affect these parameters, depending on the choice of combination used. Although many drugs used for the treatment of HIV-related disorders are myelosuppressive, severe cytopenia is most often related to the use of zidovudine [11]. Hence the need to review these parameters in a group of treatment-naïve HIV infected patients at our centre. The present study estimated the prevalence of anaemia, leukopenia and thrombocytopenia at the initiation of ART, and investigated associations between each of pretreatment anaemia, leukopenia and thrombocytopenia and baseline covariates of sex, CD4 counts and HIV-RNA viral load and clinical AIDS status at a teaching hospital in north-eastern Nigeria. The findings could inform policy and practice regarding safe provision of ART to patients who are found to have cytopenia or immunosuppression during recruitment.

Methods

Study area and design

This prospective, observational cohort study was carried out in the department of medicine at University of Maiduguri teaching hospital, Borno State from March 2008 to April 2009. This is a 500-bed hospital designated as a centre of excellence for infectious diseases and provides primary, secondary and tertiary services for the north-eastern part of Nigeria. It also caters for neighbouring countries such as Cameroon, the Niger and Chad.

Permission for the study was obtained from the University of Maiduguri teaching hospital ethics committee. Written informed consent (signed or thumbprint) was obtained from patients.

Sample

The inclusion criteria for patients were: HIV seropositive status confirmed by Western blot test; and provision of informed (written) consent. The exclusion criteria were: age < 18 years; severe renal or hepatic failure; prior history of highly active antiretroviral therapy (HAART) usage; bleeding disorder; or inability to give consent or non-consent. All consenting participants were recruited consecutively into the study.

A total of 493 patients with HIV serological reactivity determined by enzyme immunoassay and confirmed by Western blot analysis were recruited into the study. They included patients with AIDS, diagnosed by immunological or clinical criteria based on the Centers for Disease Control 1993 revised classification for HIV infection [12]. Using a structured, pre-evaluated questionnaire, information was obtained on patients' demographic characteristics, clinical manifestations, medication used, blood transfusion history and sexual and drug use behaviour. Haematological parameters and viral load are free-of-charge, routine prerequisite and pretreatment evaluations done, among other ancillary investigations, for all registered HIV patients at our centre.

Haemoglobin (Hb) and platelets count were analysed using a haematology analyser (Sysmex® Corporation). Samples for total lymphocytes count and CD4+ T-cell count was collected between 09.00–10.00 hours and assayed within 6 hours of collection of whole blood using a standardized flow cytometric machine (Cyflow®, Cytec). Plasma HIV-RNA levels was measured using freshly frozen specimen separated within 6 hours of phlebotomy utilizing the Amplicor HIV-1 monitor test, version 1.5 (Roche®), with a minimum cut-off value of 200 copies/mL.

Statistical analysis

SPSS, version 15 statistical software was used for analysis. The results are presented as mean and standard deviation (SD). Unpaired t-test was used to compare the means of all continuous variables. Categorical data were analysed using Fisher exact test. A *P*-value of < 0.05 was considered to be statistically significant.

Results

Background characteristics

A total of 493 patients were consecutively recruited, consisting of 316 (64.1%) females and 177 (35.9%) males. The overall mean age of the patients was 34.8 (SD 8.6) years, range 15–67 years. Male patients were significantly older than their female counterparts: mean age 36.6 (SD 5.2) years (range 18–67 years) versus 32.7 (SD 8.3) years (range 15–60) years respectively ($P < 0.001$). Around 40% of the study population had no formal education. The sociodemographic and clinical characteristics of males and females are shown in Table 1.

A total of 345 patients (70.0%) were diagnosed with AIDS by either clinical or immunological criteria. The majority were married; heterosexual transmission was the presumed risk factor in majority of our study cohort as participants denied other risky sexual behaviour that could put them at risk of contracting HIV infection.

The overall prevalence of anaemia, leukopenia and thrombocytopenia among the studied subjects, defined as Hb < 10 g/dL, WBC < 4×10^3/L and platelets < 100×10^3/L, was 49.5%, 5.5% and 4.5% respectively (Table 2). Anaemia was present in 109/177 males (61.6%) and 135/316 females (42.7%) ($P = 0.001$). Nine males (5.1%) and 18 females (5.7%) ($P = 0.78$) had leukopenia, while 10 males (5.7%) and 12 females (3.8%) ($P = 0.33$) were thrombocytopenic. Seven (1.4%) patients had both anaemia and leukopenia, 4 (0.8%) had anaemia and thrombocytopenia and none of the participants had leukopenia and thrombocytopenia or pancytopenia.

Association of AIDS status with haematological parameters

Patients' AIDS status was associated with presence of anaemia ($P < 0.001$) but not with leukopenia and thrombocytopenia (Table 2). The prevalences of anaemia, leukopenia and thrombocytopenia were 54.8%, 6.1% and 5.2% in AIDS patients versus 37.2%, 4.1% and 2.7% respectively in patients without the features of AIDS at evaluation.

The mean Hb level of all patients was 10.0 (SD 2.5) g/dL, mean WBC was 5.9 (SD 3.0) $\times 10^3$/L and platelet count was 291 (SD 133) $\times 10^3$/L (Table 3).

The mean CD4 count of the studied sample was 232 (SD 205) cells/μL, ranging from 5 to 1840 cells/μL. The mean CD4 counts for females were significantly higher than for males: 254

Table 1 Sociodemographic and clinical characteristics of the study group of treatment-naïve HIV-infected patients

Variable	Total ($n = 493$)		Males ($n = 177$)		Females ($n = 316$)		*P*-value
	No.	%	No.	%	No.	%	
Marital status							
Married	289	58.6	109	61.6	180	57.0	0.368
Single	164	33.3	51	28.8	113	35.8	0.138
Divorced	27	5.5	8	4.5	19	6.0	0.620
Separated	13	2.6	9	5.1	4	1.2	0.021
Literacy level							
No formal education	198	40.2	32	18.1	166	52.5	< 0.001
Quranic education	35	7.1	26	14.7	9	2.9	< 0.001
Primary education	116	23.5	47	26.6	69	21.8	0.274
Secondary education	78	15.8	48	27.0	30	9.5	< 0.001
Tertiary education	66	13.4	24	13.6	42	13.3	1.000
AIDS status							
Yes	345	70.0	116	65.5	229	72.5	0.127
No	148	30.0	61	34.5	87	27.5	0.127
Probable route of AIDS transmission							
Heterosexual	461	93.5	157	88.7	304	96.2	0.002
Blood transfusion	0	0.0	0	0.0	0	0.0	–
MSM	0	0.0	0	0.0	0	0.0	–
IV drug use	0	0.0	0	0.0	0	0.0	–
Unknown	32	6.5	20	11.3	12	3.8	0.002

MSM = men who have sex with men; IV = intravenous.

Table 2 Distribution of cytopenia in the study group of treatment-naïve HIV-infected patients with and without AIDS

Variable	Total (*n* = 493)		AIDS (*n* = 313)		No AIDS (*n* = 180)		*P*-value
	No.	%	No.	%	No.	%	
Whole sample							
Males	177	35.9	116	33.6	61	41.2	0.131
Females	316	64.1	229	66.4	87	58.8	0.131
Anaemia							
Males	109	61.6	74	63.8	35	57.4	0.503
Females	135	42.7	115	50.2	20	23.0	0.000
Total	244	49.5	189	54.8	55	37.2	0.000
Leukopenia							
Males	9	5.1	7	6.0	2	3.3	0.676
Females	18	5.7	14	6.1	4	4.6	0.808
Total	27	5.5	21	6.1	6	4.1	0.498
Thrombocytopenia							
Males	10	5.7	7	6.0	3	4.9	1.000
Females	12	3.8	11	4.8	1	1.2	0.244
Total	22	4.5	18	5.2	4	2.7	0.319
Anaemia + leukopenia							
Males	3	1.7	3	2.6	0	0.0	0.510
Females	4	1.3	2	0.9	2	2.3	0.699
Total	7	1.4	5	1.5	2	1.4	1.000
Anaemia + thrombocytopenia							
Males	1	0.6	1	0.9	0	0.0	1.000
Females	3	1.0	2	0.9	1	1.2	0.969
Total	4	0.8	3	0.9	1	0.7	1.000
Leukopenia + thrombocytopenia							
Total	0	0.0	0	0.0	0	0.0	–
Pancytopenia							
Total	0	0.0	0	0.0	0	0.0	–

(SD 223) cells/μL versus 194 (SD 162) cells/μL (P = 0.002). Only 42 (8.5%) of the participants had a CD4 count of ≥ 500 cells/μL; the majority (55.4%) had a CD4 count < 200 cells/μL (Figure 1). No sex difference was observed with regard to presence of immunological AIDS status (< 200 cells/μL) (P = 0.512).

Table 3 Distribution of the study group of treatment-naïve HIV-infected patients by age and haematological status

Variable	Total (*n* = 493)		Males (*n* = 177)		Females (*n* = 316)	
	Mean (SD)	Min.–Max.	Mean (SD)	Min.–Max.	Mean (SD)	Min.–Max.
Age (years)	34.8 (8.6)	15–67	36.6 (5.2)	23–67	32.7 (8.3)	15–59
Hb (g/dL)	10.0 (2.5)	3.9–35.3	10.3 (2.6)	3.9–16.1	9.9 (2.5)	4.5–35.3
WBC (×1 0^3/L)	5.9 (3.0)	1–27	6.0 (3.2)	2–21	5.8 (2.8)	1–27
Platelets (× 10^3/L)	291 (133)	10–1 008	264 (128)	10–837	306 (134)	47–1 008
CD4 (cells/μL)	232 (205)	5–1 840	194 (162)	5–909	254 (223)	13–1 840
Viral load (copies/mL)	324 873 (879 555)	200–8 480 982	441 222 (1 086 013)	200–7 601 010	259 657 (1 086 013)	200–8 480 982

Hb = haemoglobin; WBC = white blood cell count; CD4 = cluster of differentiation-4 cells; SD = standard deviation; Min. = minimum; Max. = maximum.

Among participants with CD4 count < 200 cells/μL, anaemia was observed in 63.5%; the corresponding prevalences were 36.3%, 33.9% and 19.0% respectively in cohorts within the CD4 count ranges 200–349, 350–499 and ≥ 500 cells/μL ($P < 0.001$). As presented in Figure 2, an inverse association was found between risk of anaemia, leukopenia and thrombocytopenia and CD4 count, as the prevalence of cytopenia declined in patients with increased CD4 count ($P < 0.001$). HIV-1 viral load, however, was not associated with the risk of cytopenia (Figure 3).

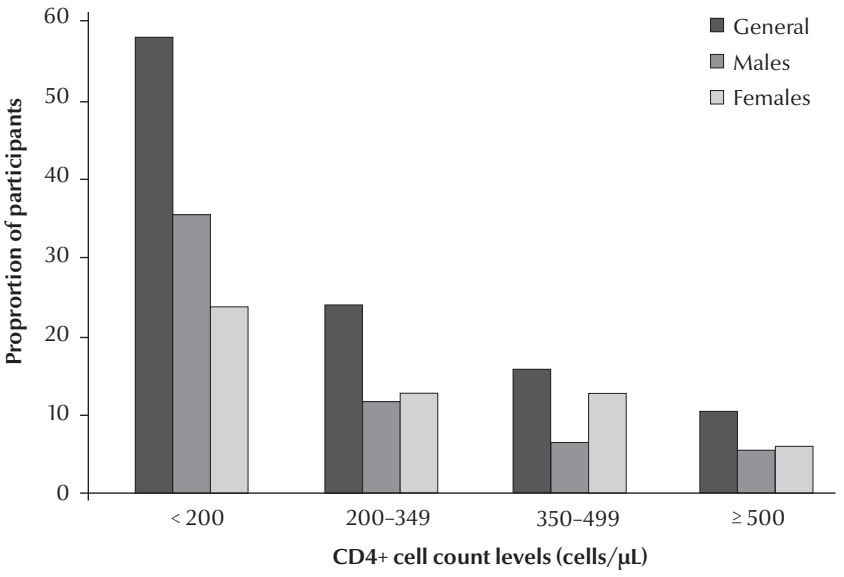

Figure 1 Distribution of CD4+ cell counts in the study group of treatment-naïve HIV-infected patients. Total *n* = 493; males *n* = 177; females *n* = 316

Discussion

This study showed that 49.5% of the sample population had anaemia, which is higher than the 18.9% prevalence reported in Uganda [13] but lower than 80% obtained by Erhabor et al. in Port Harcourt, Nigeria, among untreated HIV patients [14]. This study is in agreement with previous studies by Akinsegun et al. [15], Zon and Groopman [7], Spivak et al. [16] and a multicentre AIDS cohort study showing that anaemia was directly related to the degree of immunosupression [16].

A leukopenia prevalence of 5.5% was reported in this study compared with the 10% reported by Erhabor et al. [14]. It was also confirmed in this study that a high prevalence of leukopenia was associated with profound immunodeficiency, as was reported by Zon and Groopman [7], Spivak et al. [16] and the multicentre AIDS control cohort study [17]. A thrombocytopenia prevalence of 4.5% was shown in this study, lower than 10% reported by Erhabor et al. [14] and 16.1% by Akinsegun et al. [15]. The degree of thrombocytopenia was also directly related to the degree of immunosupression, in agreement with Jost et al. [10] and the multicentre study [17]. A decrease in serum erythropoietin levels [16], auto-antibodies to erythropoietin or marrow suppression by opportunistic infections, tumours or various medications [16,18–20] may also contribute to the anaemia commonly observed in HIV-infected persons.

This study revealed that over half (55.4%) of newly registered HIV patients will require antiretroviral drugs almost immediately because their CD4 count of < 200 cells/μL at enrolment will qualify them automatically for HAART, irrespective of symptoms, according to World Health Organization (WHO) criteria for initiating antiretroviral therapy.

This study reported a mean CD4 count of 254 cells/μL for females and

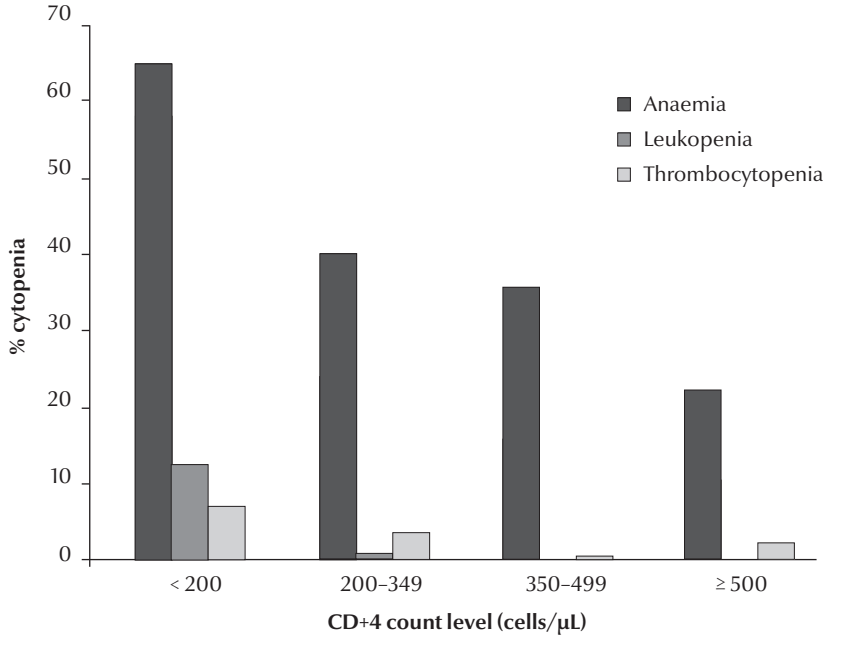

Figure 2 Relationship between CD4+ counts and cytopenia in the study group of treatment-naïve HIV-infected patients. Total *n* = 493; males *n* = 177; females *n* = 316

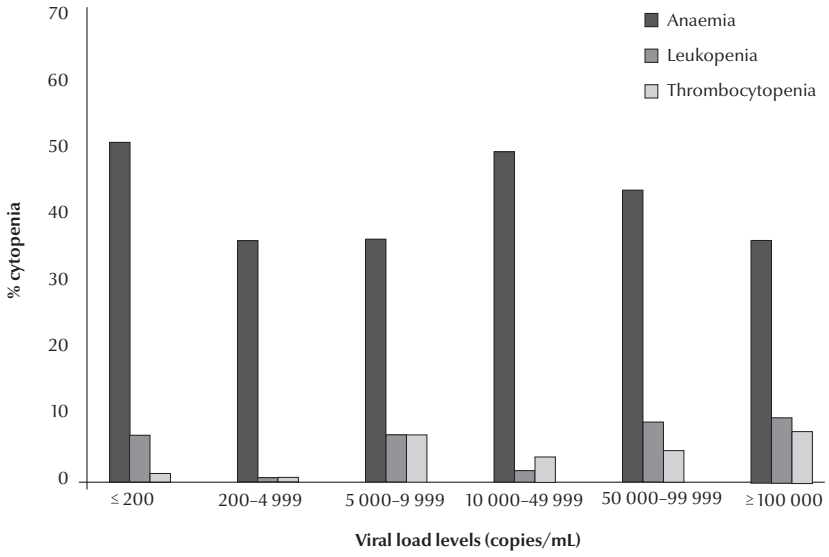

Figure 3 Relationship between viral load and cytopenia in the study group of treatment-naïve HIV-infected patients. Total *n* = 493; males *n* = 177; females *n* = 316

this was significantly higher than the mean of 194 cells/μL for males, similar to the study of Akinsegun et al. [15], but contrary to the study of Omoti et al. that reported a slightly higher CD4 count for males of 195 cells/μL versus 180 cells/μL for females [21]. Oladepo et al. established a reference value for CD4 in healthy Nigerian adults of 365–1571 cells/μL, with a mean CD4 count of 847 cells/μL [22], and this was similar to the mean value of 828 cells/μL reported by Aina et al. in an earlier study in Nigeria [23]. Females were found to have significantly higher absolute CD4 counts in this study. This observation of higher CD4 count in females has also been reported in several other countries among Nigerians [24], Ugandans [25] and Ethiopians [26]. A sex hormone effect is one possible explanation for the reported difference in CD4 counts between the sexes [26].

Patients with features of AIDS (WHO clinical stage IV) or severe immunosuppression (CD4 count < 200 cells/μL) had lower haemoglobin, leucocyte and platelet levels. However, unlike other reports [27–29], no relationship was observed between plasma HIV-RNA levels and cytopenia in this study. The hypothesis that HIV-1 infection of marrow stromal cells results in anaemia and other cytopenias was not supported by our study.

Conclusion

Almost two-thirds of HIV treatment-naïve patients at our centre had cytopenia and would require antiretroviral drugs, and the degree of cytopenia was directly related to the degree of immunosupression. In this study, unlike some reports, no relationship was observed between cytopenia and viral load. In view of this high prevalence of cytopenia, it is necessary to investigate its causes in these patients, and administer specific interventions.

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Study of methacholine positivity in patients with chronic cough at Masih Daneshvari hospital, Tehran, 2007–2008

A. Cheraghvandi,[1] L. Fadaizadeh,[2] S.A. Taheri[3] and M.R. Masjedi[4]

دراسة حول إيجابية تفاعل الميثاكولين لدى المرضى المصابين بسعال مزمن في مستشفى مسيح دانشواري، طهران، 2007–2008

ع. جراغوندي، ل. فدائيزاده، س. أ. طاهري، م.ر. مسجدي

الخلاصة: على الرغم من أن تفاعليّة السُبُل الهوائية هي إحدى خصائص الربو، فإنها لا تعتبر من الناحية التشخيصية حالة كافية، كما أن التحدي بالميثاكولين يعتبر أداة تشخيصية غير نوعية لحالات السعال المزمن تفاعلية السبل الهوائية. وتهدف هذه الدراسة المستعرضة إلى التعرف على إيجابية التفاعل للميثاكولين، وتشخيص الربو لدى مرضى السعال المزمن الذين يراجعون أحد مستشفيات طهران خلال العامَيْن 2007-2008. وشملت الدراسة 101 مريضاً بالسعال المزمن (دون سوابق التهاب الجيوب، أو عدوى رئوية حديثة، أو التهاب قصبات، أو رجوع المفرزات الهضمية، أو أية حالات رئوية مستبطنة). وقد اتضح أن 51.5٪ ممن شملتهم الدراسة لديهم تفاعل السُبُل الهوائية للاختبار بالميثاكولين، وأن 49.6٪ منهم كانوا غير متفاعلين، وأن تفاعل 7.9٪ منهم غير محددة. وقد ترابط اختبار التحدي بالميثاكولين ترابُطاً إيجابياً مع الأزيز. ورغم أن اختبار التحدي بالميثاكولين لا يُعَدُّ اختباراً أولياً في تقييم السعال المزمن، فقد يكون اختباراً استرشادياً في الربو عند عدم وضوح سبب آخر للسعال المزمن.

ABSTRACT While airways reactivity is among the characteristics of asthma, it is not considered a sufficient condition diagnostically and the methacholine challenge is a non-specific diagnostic aid in cases of chronic cough and reactive airways disease. The aim of this cross-sectional study was to determine the metacholine response positivity and diagnosis of asthma in patients with chronic cough presenting to a hospital in Tehran during 2007 and 2008. Of 101 patients with chronic cough (with no history of sinusitis, recent pulmonary infection, bronchitis, gasteroesophageal reflux or underlying pulmonary conditions), 51.5% showed reactive airways disease to the methacholine test, 40.6% were unreactive and 7.9% were indeterminate. A positive methacholine challenge test was positively correlated with new wheezing. Although the methacholine challenge test is not a primary test for evaluating chronic cough, if no other reason for chronic cough is found, it may be a guiding test for asthma.

Étude de la positivité à la méthacholine chez des patients souffrant de toux chronique à l'hôpital Masih Daneshvari de Téhéran entre 2007 et 2008

RÉSUMÉ Si la réactivité des voies aériennes compte parmi les caractéristiques de l'asthme, elle n'est pas considérée comme suffisante pour poser un diagnostic ; la provocation à la méthacholine est une aide non spécifique pour le diagnostic dans les cas de toux chronique et d'hyperréactivité des voies aériennes. La présente étude transversale visait à déterminer la positivité à la méthacholine et le diagnostic d'asthme des patients souffrant de toux chronique ayant consulté dans un hôpital de Téhéran entre 2007 et 2008. Sur un total de 101 patients atteints de toux chronique (sans antécédents de sinusite, d'infection pulmonaire récente, de bronchite, de reflux gastro-oesophagien ni d'affections pulmonaires sous-jacentes), 51,5 % ont présenté une hyperréactivité des voies aériennes au test de provocation à la méthacholine, 40,6 % n'ont pas eu de réaction et 7,9 % ont eu des résultats non concluants. Un résultat positif au test de provocation à la méthacholine était positivement corrélé à la survenue d'un sifflement. Le test de provocation à la méthacholine ne représente pas le test principal permettant d'évaluer une toux chronique mais peut toutefois être utile pour établir le diagnostic d'asthme si aucune autre cause n'est identifiée pour la toux chronique.

[1]Lung Transplantation Research Centre; [2]Telemedicine Research Centre; [3]Clinical Tuberculosis and Epidemiology Research Centre; [4]Chronic Respiratory Diseases Research Centre, National Research Institute of Tuberculosis and Lung Disease, Shahid Beheshti University of Medical Sciences, Tehran, Islamic Republic of Iran (Correspondence to A. Cheraghvandi: cheraghvandiali@yahoo.com).

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Introduction

One of the characteristics of most asthmatic patients is cough and increased airways responsiveness on exposure to selected allergens. Yes, while airways reactivity is among the characteristics of asthma, it is not considered a sufficient condition diagnostically. It is also not clear which comes first, control of bronchial diameter or hyper-reactivity [1].

The methacholine challenge test is a non-specific diagnostic aid in cases of chronic cough and reactive airways disease. In a report by Wongtim et al. the methacholine test was shown to have an important role in reaching a diagnosis in patients with chronic cough and its positive predictive value for asthma was 60%–82% [2]. In another large study in Australia with 876 participants, 81% had hyper-responsiveness to inhaled histamine while only 6% were diagnosed with asthma based on reactivity of the airways [3]. In a similar study of airways reactivity linked to various occupations it was demonstrated that hyper-reactivity was much more common than what could be medically termed asthma [4,5]. It seems therefore that airways hyper-reactivity is only one part of asthma and can also be a cause of chronic cough. As a result, it is prudent to look for other reasons for airways reactivity and not attribute it only to asthma. Specific and non-specific tests can be helpful in this endeavour. Studies concerning cough and asthma are few and we planned this study to determine the prevalence of asthma among patients with symptoms of cough who had an extensive work-up for this condition. Patients in whom a definite diagnosis using clinical symptoms or spirometry results could not be reached were invited to participate in the methacholine challenge test.

Methods

Sample

This was a cross-sectional study of patients with chronic cough during the years 2007 and 2008. All patients over the 2-year period who presented with chronic cough and who met the inclusion criteria were included in the study. The inclusion criteria were chronic cough of more than 3 weeks duration, cough without a known cause, age above 10 years and normal radiography of the chest, sinuses and spirometry. Exclusion criteria were all patients with asthma, pulmonary infections, gastro-esophageal reflux, foreign body aspiration, recent upper respiratory infections (within 8 weeks), chronic bronchitis, sinusitis or other pulmonary conditions or symptoms consistent with airways disease such as wheezing.

Data collection

Patients were advised not to take methacholine, theophylline, antihistamines, β_2-agonists, sympathomimetics or anticholinergic medications for 48 hours before the test. The methacholine test was performed according to the following pulmonary laboratory protocol.

A spirometry test was performed and if the patient's forced expiratory volume in 1 sec (FEV1) was above 70% of expected, saline nebulizer treatment was given for 2 minutes. After 3 minutes rest the patient underwent a spirometry test. If FEV1 did not drop by 20%, treatment with methacholine was started. The first concentration of the methacholine nebulizer was 0.03 mg/mL for 2 minutes, after which 3 minutes of rest was given and spirometry was performed again. If there was no drop in FEV1 below 20%, testing was continued with double doses of methacholine until one of these occurred: a drop in FEV1 20% below the first FEV1 or a dose of 16 mg/mL methacholine was reached. If a patient developed coughing, shortness of breath or wheezing, the test was ended and considered positive.

A drop in FEV1 of 20% was considered positive for airways hyper-reactivity, 16% was considered negative and between 16%–20% was considered indeterminate and the test was repeated after 2 weeks.

Data analysis

Information from the patient's history, physical examination and the methacholine test results were analysed statistically using the chi-squared test. Statistical analysis was done using *SPSS*, version 9.

Results

A total of 101 participants met the inclusion criteria (51 men and 50 women), with a mean age of 38.8 [standard deviation (SD) 15.4] years, range 14–74 years.

All patients had a history of cough of more than 3 weeks. Other clinical symptoms, summarized in Figure 1, showed that 61.4% had shortness of breath, 52.5% had paroxysmal nocturnal dyspnoea and 48.5% had sputum production. Of the total patients 9.9% were smokers but none reported being substance abusers. At study entry none of them had other pulmonary diseases, sinusitis, recent cold (past 8 weeks) and wheezing on auscultation. In their past medical history 32 individuals (31.7%) reporting having had sinusitis, 9.9% eczema and 4.0% acute bronchitis.

The final results of the methacholine challenge test showed 52 cases were positive (51.5%), 8 were indeterminate (7.9%) and 41 were negative (40.6%). The rate of airways reactivity was higher among women (58.0%) compared with men (45.1%) but this was not statistically significant (Table 1). The mean methacholine concentration in the nebulizer that gave positive test results was 7.8 (SD 6.9) mg/mL, range 0.06 to 16 mg/mL. Of the individuals with a positive test, 42/52 (80.8%) had a 20% decrease in FEV1, 9 (17.3%) had wheezing and 1 (1.9%) developed severe coughing and the test was discontinued. Patients with positive tests were prescribed bronchodilators. Of the 8

Table 1 Distribution of patients with chronic cough based on response to the methacholine challenge test, Masih Daneshvari hospital, 2007–2008

Sex	Response						
	Positive		Negative		Indeterminate		Total
	No.	%	No.	%	No.	%	
Male	23	45.1	25	49.0	3	5.9	51
Female	29	58.0	16	32.0	5	10.0	50
Total	52	51.5	41	40.6	8	7.9	101

patients who had indeterminate test results, none returned for retesting and a definite diagnosis was not possible.

The mean fall in FEV1 on challenge was 21.4 (SD 8.7) L, for FVC was 14.7 (SD 9.4) L and for peak expiratory flow (PEF) was 19.8 (SD 6.1) L/min. On receiving a bronchodilator, the mean increase in FEV1 was 15.7 (SD 9.5) L, FVC 8.7 (SD 5.9) L and PEF was 6.1 (SD 18.6) L/min.

The chi-squared test showed that only a positive methacholine challenge test had a positive correlation with the presence of wheezing ($P < 0.001$) but not with any other symptoms (including bronchitis, eczema and sinusitis) [data not shown]. Only 10 individuals were smokers and therefore no statistical conclusions could be reached about the influence of smoking.

Discussion

In this study 101 participants with chronic cough underwent the methacholine challenge test. The results showed that 52 (51.5%) of them had airways hyper-reactivity to the test, which is comparable to the results from similar studies [6–9]. Patients with chronic cough may show hyper-reactivity significant enough to undergo more complete evaluation. The average dose of methacholine that led to positive test was 7.8 (SD 6.9) mg/mL, which is similar to these other studies. A positive methacholine test at doses < 8 mg/mL (proactive concentration) may therefore be a good marker for diagnosis of asthma [1].

The rate of airways reactivity was higher in women than men (58.0% versus 45.1%) but this was not statistically significant. While a similar result has been found in some studies [10–13], other studies do not support this finding [14,15].

In this study, only a positive methacholine challenge test had a positive correlation with wheezing, which could be sign of airways hyper-reactivity that is not seen with other symptoms. Individuals with sinusitis, eczema and acute bronchitis did not show a positive methacholine challenge test and a history of such conditions may not influence airways hyper-reactivity.

During the methacholine challenge test, the average drop in FEV1 for positive tests for these patients was 21.4 (SD 8.6) L and the increase after bronchodilator administration was 15.7 (SD 9.5) L, which can be a sign of bronchial asthma [1]. A 16% improvement in FEV1 using a bronchodilator is an indicator of effective therapeutic response.

In conclusion, even though the methacholine challenge test is not a primary test for evaluating chronic cough it may be a guiding test for asthma, if no other reason for chronic cough is found.

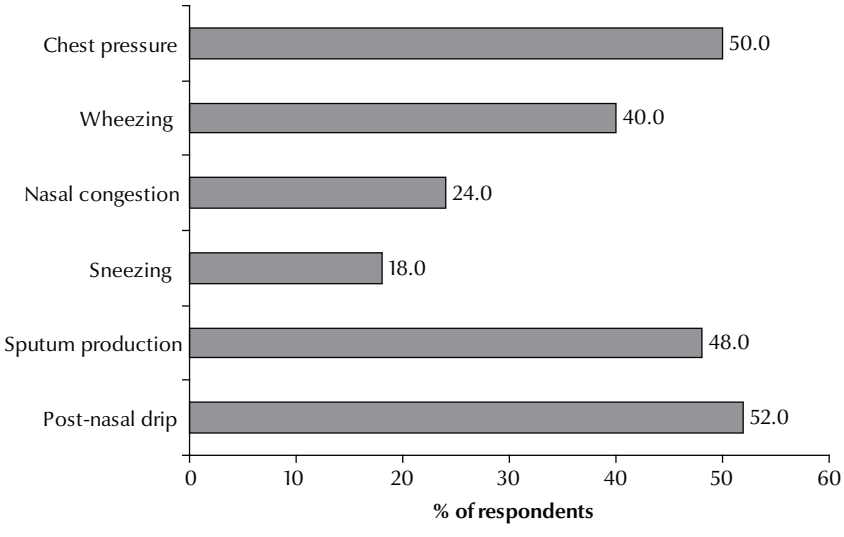

Figure 1 Clinical symptoms of 101 patients with chronic cough, Masih Daneshvari hospital, 2007–2008

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Renal patients' views on generic prescribing and substitution: example from the United Arab Emirates

M.N. Al Ameri,[1,2] W. Mohamed,[2] E. Makramalla,[2] B. Shalhoub,[3] A. Tucker[1] and A. Johnston[1]

وجهات نظر مرضى الكلى حول وصف الأدوية المماثلة وبدائلها: مثالٌ من الإمارات العربية المتحدة

مبارك ناصر العامري، ولاء محمد، عماد مكرم الله، بسام شلهوب، آرثر تاكر، آثول جونستون

الخلاصة: يدرس هذا المسح مدى الوعي المتوافر حالياً لدى المرضى ومدى فهمهم لبدائل الأدوية المماثلة. فقد مسح الباحثون آراء 188 مريضاً باستخدام 36 سؤالاً متعدد الاختيارات في مستشفيين في الإمارات العربية المتحدة. ووجد الباحثون أن 70٪ من المرضى على علم بتوافر الأدوية المماثلة، وأن 60٪ منهم يفهمون المصطلحين "مماثل" و"اسم تجاري" بالنسبة للأدوية، وأن 64٪ منهم على اطلاع على بدائل الأدوية المماثلة المتاحة في الممارسة. إلا أن 32٪ منهم لا يعرفون إن كانوا يتناولون أدوية مماثلة، وأن 31٪ منهم يشعرون بأن الأدوية المماثلة لا تكافئ أو تكافئ جزئياً الأدوية "ذات الاسم التجاري" وصرح ما يقرب من نصف المرضى (47٪) أنه سيرفضون أخذ البديل المماثل للسيكلوسبورين – عندما يتوافر – بقصد توفير أموال السلطات فقط. وفي رأي الباحثين فإن الإحلال العشوائي للأدوية المماثلة ينبغي أن لا يتم تنفيذه، لوجود بعض الشكوك مع فقد المعلومات الكافية حولها لدى المرضى.

ABSTRACT This survey examined current patient awareness and understanding of generic substitution. We surveyed 188 renal patients using 36 multiple-choice questions in 2 hospitals in the United Arab Emirates. We found that 70% of patients were aware of the availability of generic medicines, 60% understood the terms "generic" and "branded" in relation to medicines and 64% were conscious of generic substitution practice. However, 32% did not know if they were taking generics and 31% felt that generics were not equivalent or only sometimes equivalent to branded medicines. Nearly half (47%) the patients stated they would refuse generic substitution of ciclosporin when it became available if this was just to save the health authority money. In our opinion, random generic substitution should not be implemented because there is still uncertainty and lack of knowledge among patients.

Points de vue des patients atteints d'une maladie rénale sur la prescription des génériques et leur utilisation en substitution : exemple des Émirats arabes unis

RÉSUMÉ La présente étude a examiné les connaissances et la compréhension actuelles des patients en matière de substitution par des génériques. Nous avons enquêté auprès de 188 patients atteints d'une maladie rénale à l'aide de 36 questions à choix multiples dans deux hôpitaux des Émirats arabes unis. Nous avons trouvé que 70 % des patients connaissaient la disponibilité des médicaments génériques, 60 % comprenaient les termes « génériques » et « de marque » pour les médicaments et 64 % étaient conscients de la pratique de substitution par des génériques. Toutefois, 32 % des patients ignoraient s'ils prenaient des génériques et 31 % avaient le sentiment que les génériques n'étaient pas équivalents ou n'étaient que parfois équivalents aux médicaments de marque. Près de la moitié (47 %) des patients ont précisé qu'ils refuseraient une substitution par un générique de la ciclosporine quand ce dernier deviendra disponible, s'il s'agissait uniquement de permettre aux autorités de santé de faire des économies. À notre avis, la substitution par des génériques ne doit pas être mise en œuvre de manière aléatoire en raison de l'incertitude et des faibles connaissances des patients.

[1]Department of Clinical Pharmacology, William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Mary, University of London, London, United Kingdom (Correspondence to: M.N. Al Ameri: m.al-ameri@qmul.ac.uk).
[2]Global Medical Solutions, Abu Dhabi, United Arab Emirates.
[3]Abu Dhabi Health Authority, Abu Dhabi, United Arab Emirates.

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Introduction

In the last 2 decades healthcare costs have been climbing globally. For example, spending on drugs in the United Kingdom represents over 10% of the total health service budget, and has increased steadily over recent decades [1]. In the United Arab Emirates (UAE), the consumption of medicine reached 4 billion UAE dirhams in 2010 [2]. In the next 2 decades, healthcare expenditure is predicted to rise from US$ 14 billion in 2008 to US$ 60 billion in the countries of the Gulf [2]. As a result, many countries may be encouraged to reduce their healthcare expenditures. Prescribing generic equivalents of branded drugs could markedly lower medication costs. This strategy has proven to be effective since it is often easier to intervene on expenditure on medicines because of their identified cost [3,4].

About 85% of the UAE pharmaceutical market consists of branded products, therefore, in the UAE medicines are mostly prescribed and dispensed in their branded form. Most of the pharmacies in the government hospitals promote branded medicines, resulting in a huge burden for the cost of treatment. Physicians also prescribe medicines by their trade names. Despite the availability of generics for some out-of-patent brands, physician still prescribe the branded form. For instance, the branded prescribing of Augmentin, Glucophage, Voltaren and Zocor is still growing despite the availability of a certain amount of generic competition [5].

In the 3 years since 2009, private health insurance has grown dramatically in the UAE. This, as a result, improved the regulators' ability to coordinate healthcare development in a direction that is beneficial to both the consumer and the pharmaceutical industry.

In addition to prohibiting direct-to-consumer marketing, a new rule requires physicians to prescribe using chemical names and choosing from a list of medicines (the hospital formulary) to overcome the influence of pharmaceutical companies [5].

Generic substitution has raised concerns about whether it serves the interests of patients or the target of reducing healthcare costs. Indeed some authors are now questioning the quality of some cheaper drugs [6–8]. Cost could be a very important factor in drug substitution and prescribability—the physician's first consideration for prescribing between a branded drug and its generic counterpart for a new patient [9]. However, drug substitution can be considered more critical than drug prescribability for patients who have been on branded medicine for a long time. Therefore, there are some safety and ethical issues around switching patients from a branded to a generic drug [8,10]. This issue of drug substitution can easily mislead patients and doctors by supporting misconceptions about generic drugs and substitution [11,12]. Some healthcare providers have been promoting generic substitution in an attempt to contain costs [13,14] although it may be difficult to determine the extent of any long term savings. Drug substitution may involve spending or costs additional to the simple product acquisition costs.

Health service providers and payers are also promoting generic substitution and are not prepared to consider that there may be a problem in that patient outcomes could be detrimentally affected, reducing potential savings from these substitutions and laying the providers open to legal redress from patients adversely affected by the substitution policies [15–17].

Generic substitution could reduce the United Kingdom (UK) National Health Service brand medicine bill by £80 million, based on a peak yearly spend of £8 billion [14]. Generics account for 83% of general practitioner prescribing in the United Kingdom [18]. Likewise, in Germany, health insurance could save €1.5 billion if prescriptions were fully generically dispensed [19]. In the United States of America (USA) generic drugs accounted for 47% of all prescriptions dispensed in 1999, 61% in 2006 and 69% in 2008 [20]. Approving generic drugs in the USA has resulted in average savings of 77% of the product cost within 1 year [21].

It is well known that patient compliance can be attained when substitution is promoted after providing information, knowledge and education. The objective of this survey was, therefore, to evaluate current awareness, knowledge and understanding about generic substitution among renal patients' in the UAE and how the medical professionals are dealing with this issue, which directly involve patients.

Methods

We carried out this multicentre survey in the nephrology departments of 2 tertiary hospitals in the United Arab Emirates (UAE), the "UAE General Hospital" and the "UAE University Hospital" (the names of the hospitals were kept anonymous to comply with their rules). This survey was approved by the administration of the UAE General Hospital and by Al Ain Medical District Human Research Ethics Committee - Protocol No. 10/64. The questionnaire had been piloted and validated previously in the Royal London Hospital in the United Kingdom for a survey carried out in that hospital [22]. The questionnaire was available in both English and Arabic to cover all patients.

The aim and the protocol of the survey was explained and discussed with the medical professionals involved in the study in both hospitals. Renal patients over 18 years, able to read and write English and/or Arabic, and willing to fill in the questionnaire were targeted. This group of patients were specified in this survey because any small changes in the medicinal effect

can negatively impact on their clinical outcome. This survey was related to all medications, not immunosuppressant agents alone.

According to the study protocol, a minimum of 100 patients were required to be surveyed in each hospital. However, nurses and pharmacists in the participating hospitals were only able to recruit a total of 188 patients: 101 patients treated at the UAE General Hospital and 87 patients treated at the UAE University Hospitals. It was difficult to enrol a higher number of patients during the regular clinic hours because of time constraints.

The questionnaire (developed by the principal researcher) used as a tool to obtain the required information had 36 multiple-choice, closed questions. Patients booked in for clinic visit were recruited by clinical pharmacists and nursing staff as patients over a period of 1 year (1 July 2010–1 January 2011 in the UAE General Hospital and 1 February 2011–1 July 2011 in the UAE University Hospital). After reviewing the information sheet which contained a brief introduction in English or Arabic about generic medicines and substitution, patients consented by agreeing to fill in the questionnaire. A researcher was available to clarify any unclear points.

The data from the questionnaire were analysed using *Microsoft Excel 2007* and *Minitab 16* statistical software. Results are reported as percentage plus 95% confidence interval (CI). Missing values are not included in the calculations of percentages; the total number of respondents for each question is given in parentheses after each question.

Results

A total of 122 (65%) male and 66 (35%) female patients with average age 49 (range 18–86; median 50) years were included in this study (Table 1).

Table 1 Demographic characteristics of the renal patients surveyed (*n* = 188) in two tertiary hospitals in the United Arab Emirates

Characteristic	No.	% (95% CI)
Sex		
Male	122	65 (58–72)
Female	66	35 (28–42)
Age distribution (years)		
≤ 39	41	22 (16–29)
40–49	48	26 (20–33)
50–59	59	32 (25–39)
60+	38	20 (15–27)
No. of medications taken daily		
1–3	62	34 (27–41)
4–6	82	44 (37–52)
7–9	18	10 (6–15)
> 9	22	12 (8–18)
Time of organ transplant[a]		
< 1 year ago	8	4 (2–8)
≥ 1 year ago	29	16 (11–22)
Only dialysis	149	80 (74–86)
Education level		
Secondary school	46	29 (22–36)
Vocational training	20	12 (8–19)
Sixth form	0	0 (0–2)
College	29	18 (12–25)
University	53	33 (26–41)
Postgraduate	13	8 (4–13)

Some data are missing for most questions.
CI = confidence interval.

The majority [80% (95% CI: 74–86)] of the participants were on kidney dialysis at the time of the survey. A total of 95 participants were classified as highly educated (graduated from college, university or postgraduate), and 66 participants were classed as less-educated (graduated from secondary school, vocational training or sixth form) (Table 1).

Many patients [70%, (95% CI: 64–77)] stated that they were aware of the availability of different forms of the same medicine and 60% (95% CI: 53–67) said that they understood the terms "generic" and "branded" in relation to medicines(Table 2). Only 33% (95% CI: 26–40) of patients felt that generics are always equivalent to branded medicines.

Many patients [85% (95% CI: 78–90)] were unaware or uncertain about the availability of the generic form of ciclosporin in the global market and 47% (95% CI: 40–55) stated that they would refuse generic substitution of ciclosporin if it become available in local hospitals (Table 2).

The effect of education on patients' acceptance of generic medicines and substitution was marked in this survey. A total of 93 highly educated patients (graduated from college, university or postgraduate) responded to a question evaluating their awareness of generic substitution practice, and 84% of these were aware of the practice, while from the 64 less educated (graduated from secondary school, vocational training or sixth

Table 2 Renal patients' (n = 188) general knowledge of generic medicines and substitution

Question	Response	No.	% (95% CI)
Were you aware that there are different forms of the same medicine available, produced by different manufacturers? (n^r = 185)	Yes	130	70 (63–77)
	No	32	17 (12–24)
	Uncertain	23	13 (8–18)
Do you understand the terms "generic" and "branded" in relation to medicines? (n^r = 185)	Yes	111	60 (53–67)
	No	61	33 (26–40)
	Uncertain	13	7 (4–12)
Are you aware of the generic substitution practice? (n^r = 185)	Yes	119	64 (57–71)
	No	18	10 (6–15)
	Uncertain	48	26 (20–33)
Are you currently taking any generic prescription medications? (n^r = 183)	Yes	52	29 (22–36)
	No	72	39 (32–47)
	Uncertain	59	32 (26–40)
Were you aware that a generic form of ciclosporin is available in most of the hospitals abroad? (n^r = 138)	Yes	21	15 (10–22)
	No	110	80 (72–86)
	Uncertain	7	5 (2–10)
Would you agree to switch your current branded ciclosporin to a generic form to save the local health authority money? (n^r = 178)	Agree	51	29 (22–36)
	Disagree	84	47 (40–55)
	Uncertain	43	24 (18–31)
Do you think that generic medicines are equivalent and have the same quality as the branded medicines? (n^r = 182)	Yes, always	59	33 (26–40)
	No, never	53	29 (23–36)
	Yes, sometimes	4	2 (0–6)
	Uncertain	66	36 (29–44)

n^r = total number of patients responding to the question.
CI = confidence interval.

form) patients who responded to the same question, only 45% were aware of the practice. Furthermore, from the 95 highly educated renal patients who responded to the question, 39% said that they would accept generic substitution of the drug, while from the 62 less educated patients who responded to the same question, only 18% confirmed that they would accept the substitution (Table 3).

Patients were asked to rate their satisfaction with generic drugs. From a total of 36 highly educated patients who answered this question, almost half [47% (95% CI: 30–65)] stated that they were very satisfied, while from a total of 26 less-educated patients who answered the same question, only 6 [23% (95% CI: 9–44)] said that they were very satisfied.

Table 3 Relationship between education level and renal patients' awareness of and attitude to generic substitution

Question	Choice	Highly educated patients[a] (n = 93)			Less-educated patients[b] (n = 64)		
		No.	%	95% CI	No.	%	95% CI
Are you aware of the practice of generic substitution?	Yes	78	84	75–91	29	45	33–58
	No	5	5	2–12	7	11	5–21
	Not sure	10	11	5–19	28	44	31–57
Would you agree to switch your current branded ciclosporin?[c]	Yes	36	39	30–65	11	18	9–44
	No	32	35	29–50	37	60	46–72
	Uncertain	24	26	17–36	14	23	13–35

[a]Graduated from college, university or postgraduate.
[b]Graduated from secondary school, vocational training or sixth form.
[c]n = 92 for educated patients and 62 for less-educated patients.
CI = confidence interval.

Attitudes towards generic medicines and substitution

Most of the patients [66% (95% CI: 53–77)] who had ever received generic medicines were dissatisfied or uncertain about their satisfaction concerning the generic alternative (Table 4). Only 33% (95% CI: 26–41) felt that being prescribed generic medicines would not affect their adherence to the medication regime.

Severity of disease also influenced patients' acceptance of generic substitution: 92 of the 183 participants who responded to this question stated that they would accept generic substitution if they had mild disease compared to only 43/181 [24% (95% CI: 18–31) who would still do so if they had a chronic disease.

Influence of professionals on patients' acceptance of generic medicines and substitution

We found that 17% (95% CI: 11–22) of 175 respondents stated that their doctor had changed their medicine to a generic form (Table 5). The majority of these patients [87% (95% CI: 79–93)], however, said that they were either not monitored or were uncertain about being monitored after switching their medicine to generic. Moreover, 54% (95% CI: 44–64) declared that no background information regarding generics and substitution was provided. According to 26% (95% CI: 20–34) of patients, pharmacist was the main source of information regarding generic substitution. Of theses, 74% (95% CI: 64–84) admitted that most information was given verbally. The reasons for switching their medicines were not discussed at all with 33% (95% CI: 24–43).

The vast majority of our participants (88%; 95% CI: 83–92) wished to be always notified when their medicines were switched (Table 5). More than half (59%; 95% CI: 51–66), believed that they should be consulted by hospital specialists or by both the general

Table 4 Renal patients' (*n* = 188) attitudes towards generic medicine and substitution

Question	Response	No.	%	95% CI
Which of the following do you think may be the potential reason for switching your medicine to the generic form? (n^r =153)	Save the Ministry of Health money	56	37	29–45
	Generics are more effective	8	5	2–10
	Generics have the same effectiveness and less costs	43	28	21–36
	The branded medicine was not available	45	29	22–37
	Other	1	1	0–4
Do you think that receiving a generic medicine might affect how regularly you take your medicines? (n^r =174)	Yes	48	28	21–35
	No	58	33	26–41
	Uncertain	68	39	32–47
How satisfied are you with the generic alternative that you are taking?[a] (n^r = 70)	Very satisfied	24	34	23–47
	Dissatisfied	20	29	18–41
	Neither satisfied nor dissatisfied	26	37	26–50
Have you experienced any differences in terms of effectiveness or side-effects between branded and generic medicines?[a] (n^r = 72)	Yes	32	44	33–57
	No	31	43	31–55
	Uncertain	9	13	6–22
Do you think adapting to these differences was a concern? (n^r = 52[b])	Yes	24	46	32–61
	No	10	19	10–33
	Uncertain	18	35	22–49
What differences between the branded and generic medicines have you experienced or heard of? (n^r = 107)	Packaging	26	24	17–34
	Shape, colour or taste	22	20	13–29
	Brand was more effective	31	29	21–39
	Generic was more effective	3	3	0–8
	Brand had more side-effects	2	2	0–7
	Generic had more side-effects	22	21	13–29
	Other	1	1	0–5

n^r = total number of patients responding to the question.
[a]Number of patients on generic medicines = 81.
[b]Out of the 72 who experienced differences.
CI = confidence interval.

Table 5 Evaluation by renal patients (*n* = 188) of the role of healthcare professionals in their acceptance of generic substitution

Question	Response	No.	% (95% CI)
In general, how far do you feel your doctor involves you in decisions regarding your medications? (n^r = 175)	A lot	82	47 (39–54)
	A bit	71	41 (33–48)
	Not at all	18	10 (6–16)
	Uncertain	4	2 (0–6)
Has your doctor ever told you to make sure that you always receive the same brand of any medicine? (n^r = 175)	Yes	29	17 (11–23)
	No	142	81 (75–87)
	Uncertain	4	2 (0–6)
Would you agree to switch your medicine to a generic alternative if your doctor felt that the 2 medicines were interchangeable? (n^r = 104)	Agree	74	71 (61–80)
	Disagree	17	16 (10–25)
	Uncertain	13	13 (7–20)
How much would you favour or oppose a requirement that patients always be notified if their medicine is changed to a generic form? (n^r = 178)	Favour	156	88 (82–92)
	Oppose	12	7 (4–11)
	Neither favour nor oppose	10	5 (3–10)
Do you think that you should be consulted about being given generic medicines? (n^r = 188)	Yes, by general practitioner	26	14 (9–20)
	Yes, by hospital specialist	56	30 (23–37)
	Agreement of both general practitioner and hospital specialist	54	29 (23–36)
	Do not think that this is necessary	52	27 (21–34)
Has your doctor ever changed your medicine to a generic form? (n^r = 175)	Yes	29	17 (11–22)
	No	142	81 (75–87)
	Uncertain	4	2 (0–6)
Did your doctor monitor the effect of your medicine after switching you to a generic medicine? (n^r = 106)	Yes	14	13 (7–21)
	No	50	47 (37–57)
	Uncertain	42	40 (30–50)
Did anyone provide you with background information about your generic medicine? (n^r = 105)	Yes	40	38 (29–48)
	No	57	54 (44–64)
	Uncertain	8	8 (3–14)
Who provided you with background information? (n^r = 168)	Specialist	38	23 (17–30)
	Hospital doctor	39	23 (17–30)
	General practitioner	39	23 (17–30)
	Pharmacist	44	26 (20–34)
	Nurse	6	4 (1–8)
	Other	2	1 (0–4)
Did you consider the information provided about your generic medicine sufficient? (n^r = 63)	Yes	30	48 (35–61)
	No	12	19 (10–31)
	Uncertain	21	33 (22–46)
Did anyone discuss the reasons for switching your medicine to the generic form? (n^r = 100)	Yes	65	65 (55–74)
	No	33	33 (24–43)
	Uncertain	2	2 (0–7)
Who discussed the reasons for switching your medicine to the generic form? Choose all applicable (n^r = 194)	Specialist	51	27 (20–33)
	Hospital doctor	45	23 (17–30)
	General practitioner	41	21 (16–28)
	Pharmacist	9	25 (19–32)
	Nurse	8	4 (2–8)
	Other	0	0 (0–2)

n^r = total number of patients responding to the question.
CI = confidence interval.

practitioner and the hospital specialist before having their medicine switched. Nevertheless, 69% (95% CI: 63–76) of respondents stated that they would be more likely to accept generic substitution if it was initiated by a hospital consultant/hospital doctor (Table 6).

Discussion

Many of our participants were familiar with the availability of different formulations of the same medicine and understood the term generic versus branded medications. In addition, many patients were able to define the generic substitution practice. However, many did not know whether if their medicine was substituted to a generic or if they were currently on generic medicines. Several were not convinced about generic medicines and substitution. These attitudes were mainly found in patients with less education, those not involved in their healthcare decisions and those who believed that substitution was mostly performed because of a shortage in the healthcare budget or in the availability of the branded medicine. These attitudes might also be related to the belief that the cheaper medicine must be inferior to the more expensive branded medicines [23].

It is clear in this study that there are factors affecting patients' decisions concerning their health. Those include education level, knowledge and the severity of disease. Highly educated patients were more knowledgeable about the practice of substitution and were therefore more accepting of generic substitution of ciclosporin than those with a lower level of education. However, there were still some highly educated patients who were unsure about the efficiency of generic medicine and substitution. These patients were not assured by their healthcare professionals about the safety and the effectiveness of the drug substitution.

Undoubtedly, the effort and time spent by healthcare professionals in monitoring patients after switching their medicine is very important to assure adherence. Most of the renal patients in this survey favoured always being notified when their medicines are switched; this might positively affect their acceptance of drug substitution. Many others would agree to accept generic substitution if they were informed clearly. This is supported by the results of a similar study on renal patients in the UK [22]. This indicates a need for educating patients and for clarifying the reasons for generic substitution and the roles of healthcare professionals in successfully introducing this practice.

Patients also reported that most information was given to them orally by pharmacists. It has been recommended that patients should be given information in written form to allow reviewing and remembering the complex medical information whenever needed [24]. However, a survey evaluating the level of interaction between physicians and community pharmacists in the UAE showed that 60% of physicians rarely or never discussed patients' drug therapy with pharmacists [25].

The guidelines for approving bioequivalency of generic medicines in the UAE are mostly based on the guidelines of the World Health Organization, the European Medicines Agency, the Food and Drug Administration in the USA, and the International Conference on Harmonization. For example, to approve interchangeability between 2 medicines, they should be demonstrated as therapeutically equivalent to one another through bioequivalence studies, comparative clinical trials and/or *in vitro* dissolution tests [26].

Our findings are comparable with those in the other studies. Although there are few published articles evaluating patients' views on generic substitution in the UAE, some have shown that drug substitution can be problematic [23,27]. Small differences in some particular drugs during manufacturing could theoretically result in significant adverse effects or loss of efficacy [7,28]. A large number of studies have been conducted to evaluate the potential effect of generic substitution on the clinical outcome. Some of these have concluded that generic substitution had unexpected and negative effects [29,30].

A number of studies have shown differences in the pharmacokinetic profile

Table 6 The influence of healthcare professionals on renal patients' (n = 188) acceptance of generic substitution

Question	Response					
	Yes		No		Uncertain	
	No.	% (95% CI)	No.	% (95% CI)	No.	% (95% CI)
With which healthcare professional would you be likely to accept generic substitution?						
Hospital consultant/doctor (n^r = 179)	124	69 (62–76)	46	26 (19–33)	9	5 (2–9)
General practitioner (n^r = 168)	61	36 (29–44)	94	56 (48–64)	13	8 (4–13)
Pharmacist (n^r = 164)	56	34 (27–42)	97	59 (51–67)	11	7 (3–12)
Nurse (n^r = 156)	25	16 (11–23)	123	79 (72–85)	8	5 (2–10)

n^r = total number of patients responding to the question.
CI = confidence interval.

of branded and generic drugs that might affect clinical outcomes [31–34]. Some have also indicated that healthcare costs were higher for patients receiving generic versus branded medicine. One study revealed that total healthcare costs were significantly higher for patients receiving generic ciclosporin A compared to the branded form [15]. Another study reported that patients treated with the branded ciclosporin A had lower overall healthcare costs [16].

This study had a number of limitations. Attitudes toward generic substitution were mainly assessed from the patients' viewpoint and not that of healthcare professionals. The survey was completed in only 2 hospitals in the United Arab Emirates, the results cannot, therefore, be generalised to the whole country or region.

There were missing responses to many of the questions asked and this will have an effect on the results; therefore, these results have to be considered with caution.

Conclusion

Many patients were sceptical of accepting generic medicines and substitutions. Some considered cheaper drugs as being less effective and associated with increased adverse events. This can negatively affect patients' adherence to a medication regime. In addition, the regulations surrounding generic bioequivalence and substitution should be strengthened to maintain high quality of care. We believe that random generic substitution should not be implemented because there is uncertainty and lack of knowledge on the patients' side. Proper patient education and monitoring and involving patients in decision regarding their health may improve transparency around the practice of generic substitution, enhance patients' assurance and promote efficient prescribing.

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Review

Demographics and the social reckoning in the Arab region

N.M. Kronfol[1]

السمات الديموغرافية والاعتبارات الاجتماعية في البلدان العربية

نبيل قرنفل

الخلاصة: إن التحولات الديموغرافية في البلدان العربية، وبسبب تناقص معدلات الولادات والوفيات منذ الثمانينات، تتجلّى بانخفاض النسبة المئوية للأطفال، وبنسبة مئوية مستقرة نسبياً في الشيوخ، ونسبة مئوية مرتفعة لمن هم في سن العمل؛ وقد يفتح هذا "التضخم الشبابي" للأشخاص الفتيان الفعّالين في سن العمل بين السكان الحاليين نافذة ديموغرافية للبلدان من أجل الاستفادة من ازدياد مبالغ التوفير والاستثمار. وتستعرض هذه الورقة الوضع الديموغرافي في المنطقة العربية وتأثير التعليم والتوظيف والهجرة والحالة الصحية والإسهام في العمل المجتمعي في المزيد من التطوير في الإقليم، بما في ذلك أثر هذه العوامل على قضايا الشيخوخة والجندر. والقصد من هذه الدراسة هو جلب الانتباه إلى أهمية هذه التغيرات الديموغرافية، وتوضيح الحاجة إلى العمل من أجل زيادة الفوائد المحتملة إلى أقصى حد بالنسبة لسكان الإقليم.

ABSTRACT Demographic transitions in the Arab countries, due to declining birth rates and mortality rates since the 1980s, are reflected in a low proportion of children, a relatively stable proportion of elderly and a high proportion of people of working age. This "youth bulge" of young, active, working-age individuals in the current population may open a demographic window for countries to benefit from increased savings and investment. This paper reviews the demographic situation in the Arab region and the impact of education, employment, migration, health status and participation in society on the further development of the region, including the impact of these factors on ageing and gender issues. The intent is to draw attention to the importance of these demographic changes and highlight the need for action to maximize the potential benefit to the population in this region.

Démographie et reconnaissance sociale dans la Région arabe

RÉSUMÉ Les transitions démographiques dans les pays arabes, en raison de la baisse des taux de natalité et de mortalité depuis les années 1980, se traduisent par une proportion plus faible d'enfants, une proportion relativement stable de la population âgée et une proportion élevée de personnes en âge de travailler. Cet excédent démographique de personnes jeunes, actives, en âge de travailler dans la population actuelle pourrait permettre aux pays de profiter d'une hausse de l'épargne et de l'investissement. Le présent article examine la situation démographique dans la Région arabe et l'impact du niveau d'études, de l'emploi, de la migration, de l'état de santé et de la participation dans la société sur le développement à venir de la Région, notamment l'impact de ces facteurs sur le vieillissement de la population et les questions liées aux spécificités homme-femme. L'objectif est d'attirer l'attention sur l'importance de ces changements démographiques et de souligner la nécessité d'intervenir afin de maximiser les bénéfices potentiels pour la population dans cette Région.

[1]*Lebanese Health Care Management Association, Beirut, Lebanon (Correspondence to N.M. Kronfol: dino@cyberia.net.lb).*

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Introduction

Understanding the effect of population change on economic growth and development is taking on added importance in the Arab region. Demographic transition produces a "boom" generation that may provide an opportunity to unleash an economic growth spurt [1]. Because birth rates in Arab countries remained high until the 1980s and then declined sharply, the proportion of young, active, working-age individuals in the current population is exceptionally large. Young people entering the labour market today do not have to mortgage the future benefits of their work to support either numerous children (as happened in the recent past) or the elderly (as will occur in the near future). The United Nations Population Division has defined the demographic dividend as the period when the proportion of children aged < 15 year falls below 30% and the proportion of old people 65+ years is still below 15% [2]. This situation, favourable to savings and investment, can theoretically yield a dividend, a "demographic gift", for the entire population. To seize this opportunity, critical policy areas need to be addressed. Policy-makers must plan for the future health care and pension income needs of this baby-boom generation when it ages.

This is a review of the demographic situation in the Arab region and the impact of education, employment, migration, health status and participation in society on the further development of the region, including the impact of these factors on ageing and gender issues. This review draws on published reports and studies by individual researchers and those in international organizations. No new data or findings are presented. The intent is to draw attention to the importance of these demographic changes and highlight the need for action to maximize the potential benefit to the population in this region.

Demography

The population of the Arab countries has increased between 1980 and 2010, rising from 170 million (3.8% of the total world population) to roughly 366 million in 2010 (about 6% of the world population) [2]. The rate of expansion has been most dramatic in the Gulf Cooperation Council (GCC) states, where the number of residents has increased nearly 7-fold since 1960 [3] due to the region's unique migration patterns and high fertility rates [4].

The annual population growth in the Middle East and North Africa reached a peak of 3% in around 1980 (2% in the world) but is predicted to decline to 2.0% (1.2% in the world [5]) between 2000 and 2020. In spite of this reduction, the population of the Arab countries is expected to continue to grow for several more decades. The Arab countries are therefore experiencing an unprecedented "youth bulge" with over 30% of the population now in the age group 15–29 years, representing over 100 million people [6]. Most Arab countries have also experienced large growths in their urban populations (Table 1), as people from rural areas gravitated towards urban employment.

Definition of youth

The United Nations defines youth as the age range 15–24 years, although others have defined this differently, including a range as wide as 10–35 years [7]. Youth is a very important phase in the human life cycle. Economically, youth are in transition from economic dependency to economic productivity. In terms of family formation, youth are often at the stage of identifying a partner for marriage, childbearing and establishment of an autonomous family. Mostly, youth is the stage of personality formation and self-realization.

Despite major improvements in health and education over recent decades, and despite a wealth of oil resources, the "[Middle East and North Africa's] political, social, and economic systems have not evolved in a way that effectively meets the changing needs of its rapidly growing young population, especially employment" [6]. The extent to which this large group of young people will become productive members of their societies depends on how well governments and civil societies invest in the social, economic and political institutions that meet the current needs of young people. Political participation and civic engagement are other

Table 1 Distribution of university graduates in different regions of the world by field of study

Field of study	Middle East graduates[a]	Asian graduates[b]	Latin American graduates[c]
Education and Humanities	37	20	9
Social Sciences	31	34	39
Medicine	6	6	11
Scientific, Technical and Engineering	18	31	24
Other	8	10	9

[a]Represented by Algeria, Egypt, Islamic Republic of Iran, Jordan, Morocco, Oman, Saudi Arabia, Palestine; [b]Represented by China, Indonesia, Korea, Malaysia, The Philippines, Thailand; [c]Represented by Argentina, Bolivia, Brazil, Chile, Columbia, Mexico, Peru.
Source: World Bank [14].

important means of providing the youth populations in the region with the tools they need to build successful futures. Civil society organizations can play an important role in this domain.

Fertility

Although the mortality rate in the countries of the Arab region began to decline in the late 19th and early 20th centuries, the decline in fertility (births per woman) did not start until the 1970s. On average, fertility in the Arab countries has declined from 7 children per woman around 1960 to 3.6 in 2000 [8]. Coupled with a significant decline in child mortality, this led to an increase in the proportion of children under 15 years, and then to an increase in the proportion of young people aged 15–24 years. The youth bulge is more pronounced in countries where the onset of fertility decline occurred later and the decline was steeper.

During the 1980s, policy-makers attempted to curb runaway population growth by encouraging birth control and promoting family planning programmes which were effective in stabilizing, and even decreasing, the fertility rate. This decline in fertility is attributable to a variety of correlated factors including better levels of education, particularly among women, women's relatively higher participation in the labour force, later marriages and increased contraceptive prevalence rates [2]. The decline in fertility rates in the Arab countries is predicted to continue in the coming decades, yet with variable speed from one country to another:

- Tunisia, Lebanon, Bahrain, Algeria, United Arab Emirates, Kuwait have reached or will reach replacement level (i.e. total fertility rate of 2.1 children/woman) before 2020.
- Libya, Qatar, Morocco will reach replacement level between 2020–2030.
- Jordan, Syrian Arab Republic, Egypt will reach replacement level between 2030–2040.
- Comoros, Djibouti, Sudan, Somalia, Iraq, Oman, Palestine, Mauritania, Yemen will reach replacement level after 2040.

However, until at least 2030, the generation reaching working age will be much larger than that reaching retirement age. Therefore, the size of the total working-age population will continue to rise steeply during the next 2 decades.

Ageing and the older population

Along with the demographic changes noted above, the Arab region will witness the gradual (and fast) increase of its older population (aged 65+ years). Whereas the proportion of older people is still in the range of 1%–4% in most countries of the region, Lebanon and Tunisia already report that the old constitute more than 7% of their respective population [9,10]. Therefore governments ought to plan for the needs of the older population, including better access to health care, social protection and pension plans especially for older women. Legislation for pension reforms have already been enacted in several Arab states. Much of the care required by the elderly in the Arab region is currently provided by family caregivers. However, this is likely to change as due to social trends and population migration an increasing share of older people are likely to be living apart from their families. Providing social and health care for the elderly will be a major challenge in the region in years to come.

Education

Education is a fundamental human right. Over the last 2 decades, Arab countries have achieved remarkable progress in educational indicators. The average rate of inclusion in primary education has increased to 80.6%, while the proportion of literate young people between 15–24 years of age has reached 83.4%. Moreover, the gender parity index for literacy became 0.92 in 2005. The region's investment in female education in the past few decades has been impressive and most countries have nearly closed the gender gap on youth literacy [11]. However, despite this progress, the goal of universal education has not been achieved [12], nor has the standard of achievement been uniform across subregions and countries in the Arab region.

Participation in secondary and university education still needs to be improved in the Arab countries [13]. Higher education tends to focus on academic disciplines that are often incompatible with the needs of the labour market. The percentage of students enrolled in scientific disciplines such as natural sciences does not exceed 30% of overall university enrolment [6]. Arab youth may find themselves having to reconsider their acquired skills, and make efforts to acquire new skills, especially in information and communications technology. Moreover, the region is still unable to bridge the educational gaps between rich and poor and between urban and rural areas, especially for women. Poverty, early marriage, lack of female teachers and girls' schools and general security conditions and civic strife are the major impediments.

Education in the Arab region suffers quantitative and qualitative deficiencies. The sector suffers from deficiencies in the curriculum and educational infrastructure, especially in public schools. Despite the increase in private universities over the last decade, there are indications that educational opportunities (when available), are often of low quality due to overcrowding of classrooms, poor infrastructure, lack of teaching materials and a shortage of teachers and well-trained staff [14]. Access to university is highly dependent on passing

national tests which are designed primarily to measure the acquisition of facts and knowledge through rote learning rather than critical and independent thinking. Women continue to enrol in fields that are traditionally considered to be appropriate for women, such as education, humanities and the arts.

Work and employment

Employment is an important phase in the life cycle of youth, enabling them to achieve economic independence and the transition from dependence on family to self-reliance. Providing decent work opportunities for young people requires coherent social, economic and population policies. Tapping the full potential of youth is one of the most critical economic development challenges facing the Middle East in the 21st century. The time spent between the end of education and obtaining their first job is often measured in years rather than months. A large majority of youth continue to live with their parents until well into their 20s. The combination of demographic pressures and social norms has creates what has been dubbed "waithood"—the long phase in which a large proportion of Middle Eastern youth spend waiting for employment and marriage [15].

Although unemployment rates vary from one country to another, on average more than 25% of youth in the Arab region are unemployed, the highest rate in the world. Youth unemployment in 2006 was reported to be 6.3% in the United Arab Emirates, 15.7% in Morocco, 17.0% in Qatar, 18.7% in Yemen, 19.7% in Oman, 21.3% in Lebanon, 25.8% in Egypt and 38.9% in Jordan [16]. This is likely to worsen; according to a World Bank report, the labour force of the Middle East and North Africa is expected to increase by 40% between 2000 and 2010, and by nearly 80% between 2000 and 2020 [17]. Youth unemployment rates are especially high in countries that suffer from occupation and conflict; in Iraq the unemployment rate among young people was estimated at 27% in 2004 and 17.5% in 2006; and in Palestine at approximately 29.8% in 2006 and 28% in 2008 [17,18].

Arab women still face barriers to employment. While women's participation in the labour force in the region reached 32% in 2006, it remained the lowest in the world (the world average was 58%); men's labour force participation, on the other hand, is comparable to other regions of the world. There are great variations within the region in terms of women's participation in the economy and the extent to which it has changed and the recent drop in birth rates and the expanded education opportunities for women [19] mean that women are becoming more likely to delay marriage and join the workforce instead. It is also worth noting that the actual rates may also be substantially higher as many women work in the informal sector. Care work is neither valued as a contribution to development, nor distributed equally, and limits the opportunities available to women to pursue education and engage in income-generating employment.

Women in Arab countries work predominantly in the public sector (mostly in the education and health sectors); 49% of women's employment is in services, compared with 39% in agriculture and 12% in industry [20]. There are several reasons for the failure of private firms in the Arab region to employ young women, including labour markets highly segregated along gender lines; employers unwilling to assume the added cost of maternity leave and child care; women's limited geographic mobility; and the lack of labour-intensive, export-oriented industries that might otherwise employ women [21]. Nevertheless, the proportion of women who are wage and salaried workers has increased substantially [20]. This increased female economic activity is due mainly to higher levels of education and a rise in the average age for marriage. More women in the 30+ years age group remain in the labour market, even after they are married and have children. This trend suggests that one income no longer suffices for the changing needs of the family and that attitudes toward women's work outside the home are slowly changing.

Promoting women's entrepreneurship is an effective way to address female unemployment and to help enhance women's economic empowerment. A recent study showed that women account for only 13% of company owners in the Middle East region, compared with 24% in Europe [19]. Women-owned firms are more likely to hire women. An issue that also deserves more attention is discouragement; when a person feels that a job search is a futile effort. It is very likely that discouragement among women is higher than among men.

Unemployment in Arab countries is concentrated among secondary-school and university graduates, rather than primary-school graduates and the illiterate (World Bank) [22]. This situation is caused by the gap between labour market requirements and educational outputs. University students are the fastest-growing group among new entrants to the labour market and the group most dependent on government employment, which is not growing fast besought or may even be shrinking [23]. Even for the most educated workers, a World Bank analysis suggests that the private sector in the Middle East and North Africa rewards education less than the public sector [17].

Added to the existing problems of youth unemployment, the workforce is expanding at a rate more than 3% per year, which means that the region will require the creation of 100 million jobs in the next 20 years. The Arab region needs 6%–7% sustained economic growth in order to keep up with its growing population. In a recent report, the director general of the Arab Labour Organization noted that Arab countries will need to spend US$ 85 billion over the next

10 years in order to create new jobs and address an unemployment crisis [24].

Governments in the region have not focused their education policies on how to ensure that the region's young people have the right skills for the jobs being created. There is even less focus on how to encourage the private sector to play a role in addressing the region's pressing employment needs. Surveys of private employers in the region report that only one-third of new graduate employees are ready for the workplace when hired (Table 2) [25]. Despite these challenges, the United Nations Development Programme concludes that education has boosted human capital in the region [26]. The oil-rich, labour-receiving Gulf countries are faced with the additional challenge of addressing the employment balance between their national and non-national work force. A rapidly growing number of young nationals are entering the labour force at a time when their governments are no longer able to guarantee lifetime employment in the public sector, on which citizens have customarily relied. Nearly all of the Gulf states are now instituting policies that push the private sector to hire more nationals.

The social and political turmoil in the region has given renewed urgency to the need to counter chronic joblessness, particularly among young people [27]. In its report, *Unlocking the employment potential in the Middle East and North Africa: toward a new social contract*, the World Bank argues that countries of the region must adopt new development policies that realign their economies [17].

Migration

Statistics on international migration in the Arab region remain scarce. Political instability and armed conflict, along with unemployment and underemployment, have been major push factors behind population movements within and from the region. All Arab countries, except for the GCC countries and Libya, have become both origin and destination countries for migrants. In certain member countries, refugees still form a large proportion of the migrants [28]. Morocco and Egypt have become unwilling recipients of migrants from elsewhere, even while their own nationals form a major part of the migrant workforce elsewhere [29].

After slowing down in the 1990s, emigration from Arab countries regained momentum in the early part of this decade [6,30]. The 20 million migrants from Arab countries represent about 5% of the region's total population [6,30]. The region is home to several economies that benefit from or even depend on remittances from abroad, such as Egypt, Jordan, Lebanon, Morocco and Tunisia, as well as countries that are among the largest sources of remittances worldwide, such as Saudi Arabia, the United Arab Emirates, Qatar and Kuwait [31]. Remittances from migrant workers to Middle East and North African countries reached US$ 28.5 billion in 2007 according to the World Bank [32] and form one of the least volatile sources of foreign exchange earnings for developing countries [33].

Health

The health of youth in the Arab region has improved over past decades. Overall death rates have dropped in all Arab countries and are expected to decline more in the next 2 decades [34]. However, youth lifestyles, such as not exercising regularly, fastfood diets and smoking, are exposing them to numerous health hazards. There is an increase in the reported incidence of HIV/AIDS [35], although official figures may be underestimates. On the other hand, progress has been made in reproductive health, with the rates of unwanted childbirth and maternal mortality declining among young women, and the number of young people having comprehensive, accurate knowledge of how to avoid sexually transmitted diseases increasing considerably [35]. Fertility rates among adolescent women (ages 15–19 years) in the region have decreased [15] and the contraceptive prevalence rate (percentage of women ages 15–49 years using contraceptives) has increased in all Arab countries [19].

There are still many problems to be tackled in women's health. Women with lower education levels are still marrying young and having high numbers of

Table 2 Survey of employers in the Arab region: responses to question about whether graduates hired in the last 5 years have appropriate skills

Country	% of HR managers agreeing			
	University graduates, hard skills	University graduates, soft skills	Vocational graduates, hard skills	Vocational graduates, soft skills
Egypt	29	26	16	12
Jordan	22	25	10	16
Morocco	33	28	36	25
Saudi Arabia	51	45	41	38
Yemen	29	26	23	19

Source [25].

children, thus reinforcing the cycle of poverty [36]. There are wide urban–rural gaps in women's access to health services [36]. Female circumcision remains high in countries where it is traditionally practised (Djibouti, Sudan, Egypt, and in Yemen), even when the practice is illegal [37]. Violence against women, including honour killings persists [38], Honour killings have not been considered homicide and therefore not punished as such. There is also a high prevalence of domestic violence and sexual harassment in the Arab region [39].

Participation in public life

It is self-evident that youth who have the opportunity to participate in the life of their communities have a better chance of successful transition to adulthood, as such activities promote social integration. Nevertheless, there are still obstacles to full participation of youth in society especially in the Arab region. A United Nations report showed that Arab youth are not being represented in Arab legislatures or parliaments [40]. Moreover, Arab parliaments do not have separate committees for youth issues; instead, these are dealt with by committees concerned with sport, culture or family affairs. Older people control the process and mechanisms of youth participation in those societies. Young people are averse to political participation as they lack confidence in its procedures and the outcomes [7].

On the other hand, the region has witnessed some encouraging developments in the area of women's public participation and representation, even though the regional average is still the lowest in the world [19]. Some countries have been able to increase female representation in parliament, mainly through the use of quotas and appointments. Women candidates are generally more successful in local and municipal elections.

The feminization of poverty in the Arab region is reflected in the increasing number of poor households headed by women and a lack of adequate social welfare systems [19]. Gender inequality contributes to making women vulnerable to poverty. Women also face discrimination in property and inheritance rights [19].

Conclusion

Arab countries have diverse economies and their populations are at different stages of the transition from high to low fertility. Thus, their governments may choose different approaches to improve educational and job opportunities for youth. However, none can succeed in strengthening human capacity among youth without fundamental reforms and a greater engagement of civil society.

The labour market prospects of the region largely depend on how successfully its governments can develop new social contracts for the 21st century. The extent to which this large group of young people will become healthy and productive members of their societies depends on how well governments and civil societies invest in social, economic, and political institutions that meet the current needs of young people. The recent social and political turmoil in the Arab countries has given renewed urgency to the need to counter chronic joblessness, particularly among young people. Governments can implement a number of immediate measures to step up job creation and enhance the employability of their young populations [27]. Policy should aim at relaxing rigid labour market regulations and at providing effective social protection. Nations undergoing the demographic transition have an opportunity to capitalize on the demographic dividend offered by the maturing of boom-era populations. Given the right kind of policy environment, this demographic dividend can help to produce a sustained period of economic growth [1].

I will end this review by quoting this declaration by Her Majesty Queen Rania Al Abdullah of Jordan [41]:

> *I was once told that the only way to predict the future is to have power to shape the future. Well, here in the Arab world, we have the power. The power is our youth. We have been blessed with the biggest youth population in the world; 60% of our region is under the age of thirty. If we could channel their energy… if we could harness their potential… we could change the fortunes of our region. With almost one quarter of our young people unemployed and losing hope every day, creating opportunity has never been so urgent. But right now, we are letting them down.*
>
> *We are letting them down in ill-equipped classrooms with untrained teachers; we are letting them down with outmoded curriculums already obsolete in the modern marketplace; we are letting them down when they seek our advice and practical measures; and we are letting them down when we fail to expose them, at an early age, to the entrepreneurial spirit and potential of the private sector. From government to education providers to employers to civil society and to youth themselves, shaping our future is everyone's responsibility. If we can provide quality education that leads to lasting employment, we will have done our part in shaping the future of the Arab world. No one said it would be easy, but it is a regional imperative.*

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Report

Consensus recommendation for meningococcal disease prevention for Hajj and Umra pilgrimage/ travel medicine

A. Shibl,[1,2] H. Tufenkeji,[3] M. Khalil,[4] Z. Memish[2,4] and the Meningococcal Leadership Forum (MLF) Expert Group

توصيات صدرت بتوافق الآراء حول الوقاية من مرض المكورات السحائية في الحج والعمرة وفي طب السفر

عاطف شبل، هيثم تنفكجي، محمد خليل، زيد ميمش، مجموعة خبراء المنبر القيادي للمكورات السحائية

الخلاصة: تَرَافَق حج المسلمين إلى مكة المكرمة بفاشيات من مرض المكورات السحائية الغزوية وبانتشار عالمي للمجموعة الفرعية W-135 من النيسريَّات السحائية. ويُعد التطعيم باللقاح المضاد للمجموعات الفرعية A و C وW-135 و Y إلزامياً للحجّاج. وقد تقدم اللقاحات المتقارنة الجديدة بعض الفوائد للمجتمع بإنقاص حَمْل المكروبات. ومع إدخال الجيل الجديد من اللقاحات المتقارنة الرباعية التكافؤ المضادة للمكورات السحائية (منفيو، ميناكترا، وغيرها المرشحة للترخيص) ومع تطبيقها منذ وقت قريب في المملكة العربية السعودية، اجتمع الخبراء من 11 بلداً من إقليم شرق المتوسط في منبر قيادي في مجال المكورات السحائية في دبي في أيار/ مايو 2010، لتبادل وجهات النظر حول مرض المكورات الرئوية واستراتيجيات الوقاية منه. وقد ناقش الخبراء أهمية إدخال اللقاحات المتقترنة المضادة للمكورات السحائية للحجاج والمسافرين، ووضعوا توصيات حظيت بتوافق الآراء من أجل دعم المهنيين العاملين في الرعاية الصحية ومتخذي القرار فيها.

ABSTRACT The Islamic Hajj to Makkah (Mecca) has been associated with outbreaks of invasive meningococcal disease and the global spread of *Neisseria meningitidis* serogroup W-135. For Hajj pilgrims the quadrivalent vaccination against serogroups A, C, W-135 and Y is a mandatory requirement. Novel conjugate vaccines may provide benefits for the community by reduction of carriage. With the introduction of the new generation of quadrivalent meningococcal conjugate vaccines (Menveo, Menactra, and others pending license) and their recent implementation in Saudi Arabia, experts from 11 countries in the Middle East region met at a Meningococcal Leadership Forum (MLF), in Dubai in May 2010 to exchange opinions on meningococcal disease and prevention strategies. These experts discussed the importance of introducing conjugate vaccines for pilgrims and travellers, and elaborated a consensus recommendation to support healthcare professionals and decision-makers.

Recommandations consensuelles sur la prévention de la méningococcie pendant les pèlerinages (*Hadj* et *Omra)* et sur la médecine des voyages

Le pèlerinage islamique (*Hadj)* à La Mecque a été associé à des flambées de méningococcies invasives et à la propagation mondiale de *Neisseria meningitidis* du sérogroupe W135. Pour les pèlerins du *Hadj*, le vaccin quadrivalent contre les sérogroupes A, C, W135 et Y est obligatoire. De nouveaux vaccins conjugués peuvent être bénéfiques pour la communauté en réduisant le nombre de porteurs. Avec l'introduction d'une nouvelle génération de vaccins antiméningococciques conjugués quadrivalents (Menveo, Menactra et autres licences en attente) et leur récente mise en œuvre en Arabie saoudite, des experts de 11 pays de la Région du Moyen-Orient se sont réunis au *Meningococcal Leadership Forum*, à Dubaï, en mai 2010 pour échanger sur la maladie méningococcique et les stratégies de prévention. Ces experts ont discuté de l'importance d'introduire des vaccins conjugués pour les pèlerins et les voyageurs, et ont rédigé des recommandations consensuelles pour appuyer les professionnels de santé et les décisionnaires.

[1]Department of Microbiology, King Saud University, Riyadh, Saudi Arabia (Correspondence to A.M. Shibl: amshibl@ksu.edu.sa; amshibl1@yahoo.com).
[2]College of Medicine, Alfaisal University,Riyadh,Saudi Arabia.
[3]King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia.
[4]Ministry of Health, Riyadh, Saudi Arabia.

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Introduction

World-wide, most cases of meningococcal disease are caused by 5 of 12 known serogroups (A, B, C, W-135, Y) of *Neisseria meningitidis*. Asymptomatic carriage is common in the general population and can be as high as 35 % [1]; during the Hajj , however, this can reach 86% [2]. There are several risk factors associated with bacterial carriage: crowded conditions (e.g. military barracks, dormitories, pubs, events), travel to endemic areas and personal behaviours (e.g. kissing, coughing, smoking) all increase exposure to the bacteria [1].

Even with appropriate treatment, the case fatality rate is high: 10%–30 % depending on manifestation, age and serogroup [3,4]. Up to 20% of survivors suffer from permanent severe sequalae such as hearing loss, skin necrosis, seizures or limb amputation [3].

All 5 major serogroups of *N. meningitidis* exist everywhere at the same time, but relative proportions can vary greatly from country to country and can change unpredictably [5]. In Saudi Arabia, serogroup W-135 gained dominance within only 2 years [6], followed by other countries, e.g. Turkey, South Africa, Nigeria, Argentina, also observing much higher proportions of W-135 [7].

Travel is one of the major drivers influencing changing epidemiology. International travel can promote and accelerate the spread of different serogroups throughout the world, especially after mass gatherings such as the Hajj. In 2000 and 2001, serogroup W-135 was transferred from Hajj to other countries [6]. A comparison of the 2 outbreaks in Saudi Arabia in 2000 and 2001 shows the spread of disease outside the holy cities and an increase in cases in children < 5 years [8], indicating that the use of polysaccharide vaccines after the first outbreak did not significantly reduce carriage or prevent transmission and infection in the unvaccinated.

Plain meningococcal polysaccharide vaccines are now considered to be outdated because of a number of important limitations [9]: they are not immunogenic in young children (< 2 years); they do not elicit an immune memory and provide only limited duration of protection (~3 years); they have no significant impact on carriage and transmission; and they cannot be boosted—on the contrary, repeated polysaccharide vaccinations result in a reduced immune response (hyporesponsiveness). This has been demonstrated for serogroups C and W135 in African toddlers after PS vaccine compared to naive children [10].

In May 2010, experts from 11 countries in the Middle East region met at a Meningococcal Leadership Forum (MLF) in Dubai to exchange opinions on meningococcal disease and prevention strategies. They discussed the importance of introducing conjugate vaccines for pilgrims and travellers, and elaborated a consensus recommendation to support healthcare professionals and decision-makers.

A full background and description of transmission, burden of disease and changing pathogenicity as well as a comparison of polysaccharide and conjugate vaccines can be found in the consensus recommendations for prevention of meningococcal disease in children and adolescents that emanated from the Forum [11]. The current report presents the consensus-recommendation for meningococcal quadrivalent (ACWY) conjugate vaccination of pilgrims/travellers. This manuscript covers parts and extracts of the previously published paediatric consensus paper [11].

Consensus-recommendations

Meningitis and travel

Neisseria meningitidis is the only bacterium that can generate widespread outbreaks and epidemics of meningitis [12]. Owing to the high morbidity and mortality and the changing epidemiology, vaccination as broad as possible is recommended for prevention of meningococcal infections in travellers, particularly in pilgrims. While the incidence of infection in travellers to developing countries is about 0.5 per 100 000, it can be much higher in Hajj pilgrims (640 per 100 000) and their contacts (up to 28 per 100 000) and peaks during meningitis belt epidemics (up to 800 per 100 000) [13].

Current travel guidelines for prevention of meningococcal disease vary from country to country and according to the World Health Organization it is (only) generally recommended that vaccination should be considered for travellers to countries where outbreaks of meningococcal disease are known to occur [14]. However, for Hajj pilgrims and for travel to the extended African meningitis belt, quadrivalent vaccination is a mandatory requirement, and for travel to the extended African meningitis belt, a clear indication for meningococcal vaccination exists. Quadrivalent conjugate vaccines offer a broad serogroup protection and an assurance to prevent carriage. This would protect travellers as well as their contacts and could also be an important contribution to reduce the use of chemoprophylaxis, especially in those regions.

Meningococcal outbreaks related to Hajj pilgrimage

With globalization, pilgrim burden at the Hajj is set to rise as more people perform the pilgrimage each year. Currently, almost 3 million Muslims stay around the Holy Mosque in Makkah (Mecca) for at least 4–7 days [15]. The heavily overcrowded conditions during Hajj dramatically increase the transmission and carriage of airborne infectious agents because of prolonged stay (some people come for Umra and Ramadan and stay until Hajj, perhaps 2–3 months altogether), semi-permanent tents/shared facilities, humidity and heat, and exhaustion from performing the Hajj

rites (a large number of Muslims are elderly with poor health status).

The first large Hajj-associated meningococcal outbreak (1841 cases; serogroup A) occurred in 1987 and led to mandatory bivalent (AC polysaccharide) vaccination [16]. It was not until Hajj 2000 that a second, smaller, outbreak of meningococcal disease occurred with 253 cases in Saudi Arabia (more than one-third serogroup W-135; less than a quarter serogroup A) with sustained community transmission [16]. Shortly after this more than 400 W-135 cases were reported among returned pilgrims and their contacts from 16 countries world-wide [16,17]. All global isolates associated with this outbreak were of the single clone ET-37 (the most common clone causing epidemics), and the source of the strain was related to strains isolated in Mali, Algeria and Gambia in the 1990s [18]. In 2001, an additional outbreak (> 50% of cases were confirmed W-135) could not be prevented, mainly because not enough quadrivalent vaccine could be made available for the Ministry of Health to make it a Hajj requirement. Again, W-135 spread globally through international pilgrims, and in Saudi Arabia a large number of cases occurred among contacts of Hajjis. By May 2001 quadrivalent vaccination became a mandatory visa requirement for all pilgrims from any country. All national pilgrims as well as all residents of Makkah and Madinah (Medina) were vaccinated. Oral decolonization with ciprofloxacin prior to departure from the Hajj premises was strongly recommended to Saudi pilgrims and a national vaccination campaign for children was implemented [15]. Since the 2006/07 Hajj season, the prevention policy still recommends quadrivalent vaccine (not further specifying which technology) to all pilgrims and residents of the holy cities, and chemoprophylaxis (1 tablet of 500 mg ciprofloxacin) for arriving pilgrims from the African meningitis belt, but no longer for pilgrims leaving the Hajj premises.

For the future, conjugate meningococcal ACWY vaccine should replace the polysaccharide vaccines that decrease immune response with repeated doses. This hyporesponsiveness is an important issue, especially for those who often perform Hajj/Umra and get vaccinated every 1–3 years. Saudi Arabia decided to convert to ACWY conjugate vaccines by 2010, starting with the following target populations: all national pilgrims, all people working in the Hajj areas and all residents of Makkah and Madinah.

Consensual recommendation for ACWY conjugate vaccination

The experts of the Middle East region agreed on the concept of using conjugate vaccines, replacing polysaccharide vaccines. The overall consensus was that conjugate vaccines are the best choice for prevention of meningococcal disease, in particular because of the added value for the community: The potential of stopping transmission by prevention/clearance of carriage offers the possibility to protect the contacts of vaccinees and prevents dissemination of the bacteria to other countries. In many countries the experience is made that meningococcal infections still occur (especially at the contacts around Hajjis) despite high coverage of polysaccharide vaccination among pilgrims. Therefore the impact of conjugate vaccines on carriage is of major interest – from epidemiologic, economic and also from public health perspective, as each single case of meningococcal disease, no matter if imported or indigenous, requires a public health response (i.e. identification of close contacts for prophylaxis). It is assumed, that this class-effect of conjugate vaccines also applies to quadrivalent meningococcal conjugate vaccines, although confirming data of course are not yet available for the new vaccines. Due to the fact that Hajj pilgrims often are of older age, it is reassuring that conjugate ACWY vaccines in the age group of 56 to 65 years of age resulted in higher percentage of seroresponders for all serogroups, compared to polysaccharide vaccine [19].

Another important benefit is the chance of getting the "overuse" of antibiotics under control: If the use of conjugate vaccines becomes widespread, there will be no more or at least much less need for chemoprophylaxis. A remaining concern in this context is, that also the conjugate ACWY vaccines do not cover all serogroups (B, X).

People who should be vaccinated with ACWY conjugate vaccination

These include:

- all Hajj and Umra pilgrims (especially when Umra is performed in peak times such as Ramadan);
- travellers to the extended African meningitis belt;
- travellers to countries where outbreaks are known to occur or with epidemic risk;
- military and national guard;
- health-care workers in countries with a high burden of disease (especially those working in intensive care units, laboratories, paediatric ward);
- health-care workers, policemen and other personnel in the Makkah and Madinah area as well as in airports and seaports that receive pilgrims;
- participants of exchange programmes (pupils, students, au-pairs, expatriate workers) before long-term stays in countries with recommended meningococcal immunization, if required by host institution;
- high-risk groups (e.g. the elderly; immunodeficient patients).

Recommended implementation strategy

In general, conjugate vaccine should replace plain polysaccharide vaccines. Start with high-risk groups (primarily pilgrims) and continue going down.

Owing to the fact that plain polysaccharide vaccines induce hyporesponsiveness, consideration should be given to ensuring that anyone being vaccinated for the first time (i.e. polysaccharide-naive persons) gets a conjugate vaccine.

For the transition period, when both types of vaccines are still available and polysaccharide vaccines will be used in parallel, one could consider to give it preferentially to older populations who will go to Hajj only once in lifetime and who do not travel frequently.

For pilgrims at least it should be ensured that everyone coming for Hajj or Umra is vaccinated against ACWY meningococci, prioritizing conjugate vaccines as early as available. At present the use of ACWY conjugate vaccines is limited to the registered age-ranges [2+ years or 11+ years for Menveo (depending on the country), 9 months–55 years for Menactra].

For certain countries the costs of conjugate vaccines may be a problem at introduction, but these will be recovered within a few years through the potential for prolonged protection and herd immunity (which has to be demonstrated by clinical studies). Costs really need to be considered in relation to benefits; after some years, and with widespread use, conjugate vaccines may even be cost–effective.

There are many questions to be answered in the coming years, nevertheless the concept of conjugate vaccines offers convincing and significant progress in preventing meningococcal disease, treatment for which is always is a race against time and immediate appropriate medical care may not be available everywhere.

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Case report

A case of vocal tic: an unusual presentation of neurobrucellosis

G.I. Bayhan,[1] G. Tanır,[1] U. Ertan[2] and S. Bodur[3]

Introduction

Brucellosis is the most widespread zoonosis in the world. The disease is endemic in countries bordering the Mediterranean [1–3]. It is a multisystem disease that may present with a broad spectrum of clinical manifestations and complications. Neurologic manifestations of brucellosis are rare, occurring in 3%–5% of patients with systemic brucellosis [4]. Nervous system manifestations are very heterogeneous, and include clinical syndromes like meningitis, encephalitis, myelitis, radiculitis and the involvement of cranial or peripheral nerves [2,5].

In this report we describe a case which presented with unexplained chronic cough, refusal to eat and constipation. The observation of "dry cough with a bark-like vocalizations" and psychiatric consultation established the diagnosis of tic disorder. After the diagnosis and treatment of neurobrucellosis as an underlying condition, vocal tic of the patient completely resolved.

Case report

A 11-year-old boy presented with a 3-month history of cough, nervousness, generalized arthralgia and headache. He had lost his appetite and been refusing any food intake for 1 month. He had been suffering from constipation and he had defecated only 1 time since the previous month. He had lost an estimated 4 kg weight.

On admission, physical examination of the patient was completely normal, including neurological signs. Dry cough with bark-like vocalizations was observed during hospitalization. These vocalizations were unrelenting and were precipitated by the presence of people in his room. It was also observed that the patient could not eat anything, for this reason a feeding tube was employed.

Initial laboratory studies showed a white blood cell count of 3600/mm^3 with 44% neutrophils, 46% lymphocytes; haemoglobin 15.2 g/dL; haematocrit 43.6% and platelets 261 000/mm^3. The erythrocyte sedimentation rate was 4 mm/h and C-reactive protein 1.89 mg/L (normal < 2.9 mg/L). Biochemical investigations were normal except for a high total protein level of (8.5 g/dL (normal range 6–8 g/dL), albumin 4.6 g/dL normal range 3.1–4.8 g/dL).

Investigations were performed to explore the chronic cough, anorexia, vomiting and constipation. Chest X-ray was normal. Tuberculin skin test was negative. *Mycoplasma pneumoniae* IgM and IgG were negative by enzyme immunoassay. Vocal cord laryngoscopy was performed under general anaesthesia and revealed no oedema, swelling or inflammation of the vocal cords. Airway anatomy and vocal cord motion was normal. Ultrasonographic examination of the abdomen showed a mesenteric lymphadenopathy with nonpathological dimension. The child was given a barium swallow examination for refusal to eat and vomiting. The findings were suggestive of partial web in the duodenum. For this reason gastrointestinal endoscopy was performed. There were no stricture, oesophagitis, gastro-oesophageal reflux and gastric ulcer. Colonoscopy was performed to rule out organic reasons of constipation. There were no stenoses, ulcerations, intestinal obstruction, malignancies, inflammatory bowel disease, or diverticular disease.

After these extensive investigations, a psychiatric consultation was done. Psychiatric evaluation revealed good general appearance and motor activity, stable affect and complete orientation. The patient was communicative but his speech had been frequently interrupted by a vocal tic. Thought content of the patient was generally about his cough. He was evaluated as having vocal tic disorder. Treatment with risperidone and fluoxetine was initiated.

The presence of psychiatric findings which were unresponsive to 2-week anti-depressive treatment, the high serum protein level, and leukopenia suggested that the patient might have an organic disease with neuropsychiatric symptoms. The history of the patient was re-evaluated and revealed the consumption of unpasteurized cheese. Rose bengal test, brucella tube agglutination and brucella Coombs' test were all negative. Enzyme immunoassay was positive for Brucella IgM and IgG. The child was diagnosed as having brucellosis and it was thought that the psychiatric findings

[1]Department of Paediatric Infectious Diseases; [2]Department of Paediatrics; [3]Department of Child and Adolescent Psychiatry, Dr Sami Ulus Maternity and Children's Health and Diseases Training and Research Centre, Ankara, Turkey (Correspondence to G.I. Bayhan: gibayhan@gmail.com).

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of the patient might be attributed to brucellosis.

To investigate the neurobrucellosis lumbar puncture was performed. The cerebrospinal fluid (CSF) did not contain white blood cells, protein level was 23 mg/L (normal range 15–45 mg/dL) and glucose level was 66 mg/L (normal 40–70 mg/dL). Bacterial cultures of the CSF were negative. Magnetic resonance imaging of the brain revealed normal findings. Brainstem auditory evoked potential (BAEP) investigation of the patient was normal. For visual evoked potential (VEP), P100 latency was prolonged bilaterally.

Treatment with antibrucella drugs (oral rifampicin 20 mg/kg per day, doxycycline 200 mg/day and intravenous gentamicin 7.5 mg/kg per day) was administered at the 14th day of hospitalization. The patient's condition gradually improved and the psychiatric symptoms resolved completely after 13 days of the antibrucella treatment so risperidone and fluoxetine were stopped.

The patient was discharged from hospital 4 weeks later and antibrucella therapy was completed to 6 months. He was symptom free and had gained 1 kg at the 6-month follow-up.

Discussion

Brucellosis is a multisystem disease that may present with various clinical manifestations and complications. Neurobrucellosis is one of the complications and is rare in children, being reported in only 0% to 3.8% of children with brucellosis [1,6–12]. Paediatric neurobrucellosis studies are, however, scarce in the English scientific literature [12,13]. Meningoencephalitis is the most common neurologic manifestation. Other reported clinical presentations of neurobrucellosis are meningovascular involvement, parenchymatous dysfunction, peripheral neuropathy/radiculopathy, sensorial and motor abnormalities, cranial nerve involvement, epilepsy, brain abscess, subarachnoid haemorrhage [4,6,14]. In our patient, who had completely normal neurological examination findings, meningoencephalitis, subarachnoid haemorrhage and brain parenchymal lesion were excluded by CSF and MRI investigations. Although headache, mental inattention, and depression are common complaints in patients with neurobrucellosis, presentation with isolated psychiatric symptoms is rare [15–17]. Our patient had psychiatric symptoms include refusal eating, chronic irritating cough with barking and nervousness. These findings were attributed to vocal tic, which caused social difficulties for the patient, especially in school, along with nervousness and depressive signs.

We think that the patient's tic severely affected his social and daily functioning; for this reason medical treatment was commenced. Transient tics usually begin between 3 and 10 years of age and wax and wane over a period of 4 weeks to 1 year. The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) criteria state that they must persist for less than 6 months [18]. Although the patient's age and the duration of the tic were consistent with transient tic, in the end, the diagnosis of brucellosis discarded a diagnosis of transient tic. The etiology of tics in general remains unclear.

The reported psychiatric manifestations in neurobrucellosis in adult patients are depression, amnesia, psychosis, nervousness, irritability, agitation, nightmares, impaired cognitive function, loss of perception, amnesia, personality disorder, various degrees of behavioural abnormalities and euphoria [2,6,15–17,19]. In a study of 27 adult patients with brucellosis (14 with manifest neurological manifestation and 13 without apparent neurological manifestation), it was demonstrated that the patients with brucellosis (neurobrucellosis and patients without neurological manifestations) had highly significant impairment in some cognitive function measures and had higher scores on depressive symptoms compared with controls [15]. In another study, changes in mental and emotional status of the neurobrucellosis patients were investigated in adults. All of the neurobrucellosis cases were diagnosed with mild depression [16]. Depression was not detected in the brucellosis patients without neurological involvement. The mean Hamilton Depression Rating Scale test score among neurobrucellosis patients improved significantly with anti-brucella treatment without antidepressive and antipsychotic treatment while in the brucellosis patients without neurological involvement no significant improvements were observed with antibrucella treatment [16]. A prospective analysis of 73 patients with brucellosis identified 13 (17.8%) neurobrucellosis cases, 10 with chronic and 3 with acute meningitis. Two patients with chronic meningitis presented only psychiatric disorders and headache [19].

Diagnosis of brucellosis is based upon serological tests and cultures. Blood culture is the gold standard in the diagnosis of brucellosis. Blood cultures are positive in 15%–90% of patients with brucellosis. In the absence of positive culture, the diagnosis can be made using serological testing with a variety of agglutination tests such as the rose bengal test, serum agglutination test, etc. The sensitivity of the serological tests ranges from 65% to 95%, but their specificity is low because of the high prevalence of antibodies in the healthy population. The lack of seropositivity in patients with brucellosis may be attributed to the performance of tests early in the course of infection, decreased serum agglutination test titre in subacute or chronic cases, or the presence of blocking antibodies [1,20,21]. Enzyme-linked immunosorbent assay (EIA) is more sensitive than other serological tests, especially when the detection of specific IgM antibodies is complemented with the detection of

specific IgG antibodies [20,22]. The specificity of EIA, however, seems to be lower than that of the agglutination tests. Serological testing with agglutination tests and EIA has been applied in the diagnosis of central nervous system brucellosis with varying success, and further research is aimed to improve the diagnosis of this condition [20]. In our patient, the lack of objective clinical findings and paucity of laboratory abnormalities initially suggested the diagnosis of depression, and treatment with anti-psychotic drugs was initiated. The final diagnosis of neurobrucellosis was by positive testing for brucella IgM, the history of raw milk ingestion and the rapid response to a specific treatment protocol.

We conclude that tic disorder during untreated neurobrucellosis in children is possible, and treatment of brucellosis may be associated with dramatic recovery of tic and comorbid conditions. Presentation with only psychiatric manifestations is extremely rare, especially in children, and clinicians should keep in mind that neurobrucellosis should be suspected in patients who experience unexplainable/unusual psychiatric problems, especially in areas endemic for brucellosis.

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Correspondence

Editor-in-chief
EMHJ
WHO Regional Office for the Eastern Mediterranean
P.O. Box 7608
Nasr City, Cairo 11371
Egypt
Tel: (+202) 2276 5000
Fax: (+202) 2670 2492/(+202) 2670 2494
Email: emhj@emro.who.int

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