

Health literacy among Iranian adults: findings from a nationwide population-based survey in 2015

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Abstract

Background: Health literacy is one of the most important determinants of noncommunicable diseases prevention. Health literacy is associated with elevated risks for poorer access to care, adverse health outcomes, and increased hospitalization and health costs.

Aims: This study aimed to determine the level of health literacy among the general adult population in the Islamic Republic of Iran.

Methods: Using a cross-sectional study during 2014–2015 with a multistage cluster sampling approach, we administered a pilot-tested standardized questionnaire to assess different domains of health literacy (i.e., reading, comprehension, communication/decision-making and Interpretation/judgment skills, individual and social empowerment, health information access and health information use) among 8439 (3935 males) individuals aged 18–60 years. Data were collected through face-to-face interviews. Descriptive statistics and multivariable linear regression method using SPSS (20) were applied to identify the factors associated with health literacy among Iranian adults.

Results: The mean health literacy level was 10.2 ± 3.8 (out of 20). Only 18% (95% confidence interval [CI]: 17.15–18.78) of the participants had adequate health literacy, while 45.7% (95% CI: 44.64–46.78) had inadequate, and the 36.3% (95% CI: 35.21–37.33) had moderate health literacy. In the adjusted linear regression model, education level (the smallest $\beta = 4.35$, $P < 0.001$), age ($\beta = 0.01$, $P = 0.002$), female sex ($\beta = 0.45$, $P < 0.001$), residency in rural areas ($\beta = 0.26$, $P < 0.001$) and having permanent job ($\beta = 1.03$, $P < 0.001$) were significantly associated with more health literacy.

Conclusion: Our findings highlighted that the Iranian adult population has an insufficient level of health literacy, which calls for comprehensive education planning to improve the levels, with special attention to certain subpopulations (e.g. illiterate populations) and domains (e.g. individual empowerment).

Keywords: health literacy, Iranian adult population, questionnaire, empowerment, health information

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Introduction

Health literacy, defined as “the degree to which individuals have the capacity to obtain, process and understand the basic health information and services needed to make appropriate health decisions”, is an increasingly recognized public health concept that mediates the association between health and education (1,2). It is a tool that can empower people to take better control of their health, and eventually leads to the development of social capital (3–5). Health literacy also influences the efficiency and effectiveness of health education and promotion programmes and is one of the most important determinants of noncommunicable disease prevention

(3). Indeed, studies suggest health literacy is a stronger predictor of health compared with other individual characteristics such as income, occupation, educational attainment or age (3,6).

Furthermore, inadequate health literacy is associated with increases in workplace incidents, hospitalization and re-admission rates, morbidity and premature death, and engagement in risky behaviours (e.g. substance use), as well as a decrease in self-care and participation in screening and disease prevention programmes (1,3). Therefore, it is essential to provide health policy-makers with reliable estimates of health literacy to help inform decision-making procedures. While education levels

have an undeniable role in the health literacy levels of individuals, other factors, such as age, environment, income, ethnicity and communication skills with health care providers, have also been identified as having an influence (7,8).

Insufficient health literacy levels vary greatly across different settings, varying from 54.3% in Germany to 58% in Turkey and 28.5% in England (9–11). Lower levels of health literacy are often observed in developing settings such as the Middle Eastern context (12). In the Islamic Republic of Iran, one of the most populated countries in the Middle East, several studies have tried to measure health literacy and reported overall insufficient health literacy levels, ranging from 41% in adults in the central province of Yazd to 68% in the southeastern province of Baluchistan (13). Previous studies have also indicated varying levels of health literacy among different subpopulations of patients, e.g., 70% insufficient health literacy in patients with diabetes (14); and age groups, e.g., 79.6% insufficient health literacy among older adults (15). However, the existing body of evidence often suffers from sampling bias (e.g. small sample size, restricted subpopulations, specific geographic areas) and has focused on specific aspects of health literacy, e.g., using the Test of Functional Health Literacy in Adults (TOFHLA), which measures patients' ability to read and understand the concepts of texts in health centres. The only nationwide study with a reasonable sample size was carried out on literate and urban individuals aged 18–65 years; however, it did not cover illiterate and rural areas (16).

Therefore, our study aimed to determine the level of health literacy in the Islamic Republic of Iran, and in particular to address the existing gaps and limitations in the literature. Using the validated Iranian Health Literacy Questionnaire (IHLQ) (17), we aimed to assess all of the important domains of health literacy and factors associated with health literacy in the urban and rural adult population across 9 major provinces.

Methods

Sampling and data collection

This cross-sectional household survey was conducted in 9 provinces (out of 31) in the Islamic Republic of Iran between May 2014 and December 2015. Through a multistage sampling scheme, 8950 individuals were recruited, 8439 of whom (3935 men, 4469 women and 35 undefined) were considered eligible for this analysis. Samples were divided equally between rural and urban areas, as well as men and women. All provinces were stratified into 3 levels of low, moderate, and high literacy based on the most recent provincial literacy rates from the Statistical Centre of Iran (18). We divided the provinces in 3 categories based on literacy: category 1: provinces with low literacy; category 2: provinces with medium literacy; and category 3: provinces with high literacy. In the majority of the provinces, the literacy proportion was high and therefore they were in category

3. We tried to select provinces based on proportional size, to be representative of the country as a whole, thus 1 province in the low literacy level group (Sistan and Baluchestan), 2 provinces from the moderate level (Kerman and Markazi), and 6 provinces from the high literacy level (Mazandaran, Qom, Booshehr, Yazd, Isfahan, and Qazvin) were randomly selected. Primary sampling units each consisting of 30 participants were randomly defined from rural and urban areas in the selected provinces. Based on the population size of selected cities and villages, 1–3 primary sampling units were enrolled. The sample size for this study was calculated to estimate the level of health literacy with a maximum 5% deviation with 95% confidence in each stratum and each subgroup.

Participants were 18–60 years old, Iranian, and able to communicate in Farsi. A systematic random sampling frame was used to inform the selection of households in each municipal area (19). If the house appeared to be occupied but no one was home, interviewers returned at another time. If no resident was available on the return visit, there was no eligible individual in the house, or the eligible respondent refused to participate in the study, an adjacent house was approached. Face-to-face interviews were conducted on the doorstep, taking 15–30 minutes (around 20 minutes for most samples). Participants were briefed about the objectives of the study. The questionnaire was self-administered for literate participants and interviewer-administered (gender-matched) for those who were illiterate.

Questionnaire

Data were collected using the IHLQ (17). This questionnaire has 53 items in 9 domains: health information access (5 items), health information use (6 items), reading skills (5 items), comprehension skills (8 items), interpretation/judgment skills (6 items), communication and decision-making skills (8 items), health knowledge (5 items), individual empowerment (6 items), and social empowerment (4 items). In a previous study, in which we validated our questionnaire, the Kaiser-Meyer-Olkin coefficient was 0.95, Bartlett's test for sphericity was statistically significant ($P < 0.001$) and Cronbach's alpha was > 0.7 (0.71–0.96) (17). The intraclass coefficient for each construct varied between 0.60 and 0.81.

Data analysis

The analysis explores factors associated with health literacy; this was treated as a categorical variable for descriptive purposes and as a continuous variable for the regression analyses. The main dependent variable in this study was health literacy. So that policy-makers would have a more accurate and clear understanding of it, first the construct scores were calculated using a Likert scale of 0–3 or 0–4. Then the final score of each construct was changed to a 0–20 scale.

Overall health literacy score was determined by aggregating correct answers from all questions and

ranged between 0 and 20. Scores were then categorized into 3 groups: inadequate (< 10), moderate (10–14) and adequate (> 14). Independent variables included age, sex, education, residence and occupation. We defined permanent job as a relatively stable job with regular salary in the last year and temporary job as a part-time job in the last year with low assurance for the work to continue.

Statistical analysis

Univariate and multivariable linear regression models were constructed to investigate the determinants of health literacy. Categorical variables were introduced to the multifactorial model using a series of indicator variables. For example, occupation had 7 categories. We selected one type of job as the reference, and created 6 binary variables, which took values of 0 and 1. To achieve a higher generalizability of the results, health literacy was standardized using the literacy level [according to the 2011 Population and Housing Census of Iran (18)] of participants as the most important predictor. To estimate the national and subnational health literacy scores, the clustering effect and the sampling weights were computed and applied to all of the descriptive and analytical statistics using random effects models. All analyses were done using SPSS, version 20, and *P*-values < 5% were considered statistically significant.

Ethical considerations

Oral informed consent was obtained from the participants after explaining the goals of the study and assuring their confidentiality. Also, questionnaires were designed to be anonymous. This study obtained ethical approval

from the Health Department of the Ministry of Health and Medical Education (Ref. No: 300.12690).

Results

Demographic characteristics

Of the 8950 questionnaires, 8439 (response rate 94.3%) were considered appropriate for the analysis. The mean age of the participants was 36.7 [standard deviation (SD) 11.5] [36.16 (SD 11.33) for women and 37.33 (SD 11.80) for men]. About 47% (*n* = 4469) of the participants were male and about 42% (*n* = 3557) were living in rural areas. Around 35.3% (*n* = 2974) of the participants had completed elementary or secondary school and 10.8% (*n* = 908) were illiterate. Most participants were housewives/homemakers (43.7%), 24.8% had a permanent job and 4.8% were retired (Table 1).

The prevalence of literacy among men was significantly higher than women (92.4% vs 86.4%; *P* < 0.001). The prevalence of illiteracy in rural and urban areas was 15.5% and 7.3%, respectively; 13.8% of rural and 27.3% of urban participants had a university degree.

Health literacy status

Figure 1 shows health literacy levels among men and women. The mean health literacy level was 10.2 (SD 3.8) (on a scale of 0–20). Overall, 45.7% of the participants had inadequate (< 10) and 18% had adequate (> 14) health literacy scores.

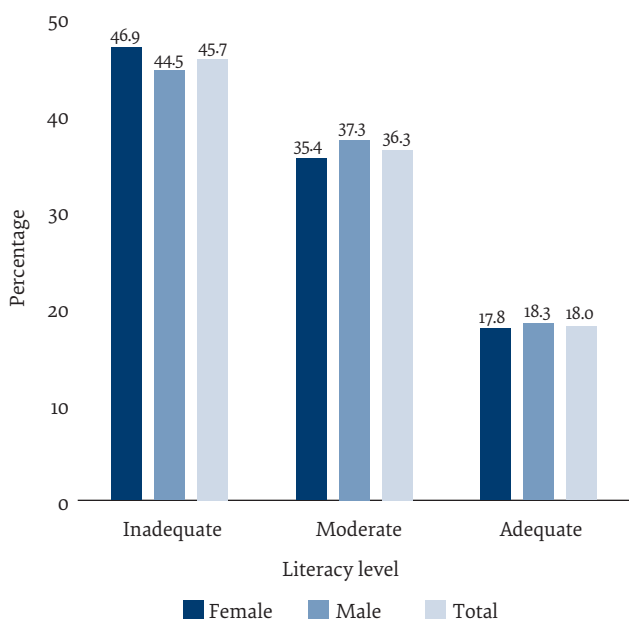
More than 95% of the illiterate participants had an inadequate health literacy level, and only 41% of those with a university degree had an adequate health literacy

Table 1 Demographic characteristics of the participants in a nationwide survey of health literacy in the Islamic Republic of Iran, 2015

Characteristic	Females (<i>n</i> = 4469)	Males (<i>n</i> = 3935)	Total (<i>n</i> = 8404)	<i>P</i> -value
Mean (SD) age (years)	36.16 (11.33)	37.33 (11.80)	36.7 (11.5)	< 0.001
	No. (%)	No. (%)	No. (%)	
Residence (<i>n</i> = 8038)				
Urban	2578 (57.7)	2288 (58.2)	4482 (58.0)	0.61
Rural	1819 (42.3)	1646 (41.8)	3556 (42.0)	
Occupation (<i>n</i> = 8363)				
Student	288 (6.5)	371 (9.5)	659 (7.9)	< 0.001
Housewife/homemaker	3458 (77.7)	193 (4.9)	3651 (43.7)	
Retired	56 (1.3)	342 (8.7)	398 (4.8)	
Unemployed	89 (2.0)	351 (9.0)	440 (5.3)	
Permanent job	345 (7.7)	1731 (44.3)	2076 (24.8)	
Temporary job	216 (4.9)	923 (23.6)	1139 (13.6)	
Education level				
Illiterate	607 (13.6)	298 (7.6)	905 (10.8)	
Elementary and secondary	1631 (36.5)	1339 (34.1)	2970 (35.3)	< 0.001
High school	1392 (31.2)	1317 (33.5)	2709 (32.3)	
College/university	834 (18.7)	977 (24.9)	1811 (21.6)	

SD = standard deviation.

Figure 1 Proportion of health literacy levels in Iranian adults (n = 8381), 2015 (P-value for comparison of the distribution of HL among the sexes is < 0.001)



level (Figure 2). Regarding health literacy domains, the highest score for inadequate health literacy was for “individual empowerment” 6775 (73.2%), and for adequate health literacy was for “communication and decision-making skills” 3903 (46.3%) (Table 2).

Association of health literacy and independent variables

The crude health literacy score decreased with age, while it significantly increased with age in the adjusted models (P = 0.01). In the crude model, the mean HL score for

Figure 2 The health literacy levels of Iranian adults according to education level, 2015 (P-value for comparison of the distribution of HL among education levels is < 0.001)

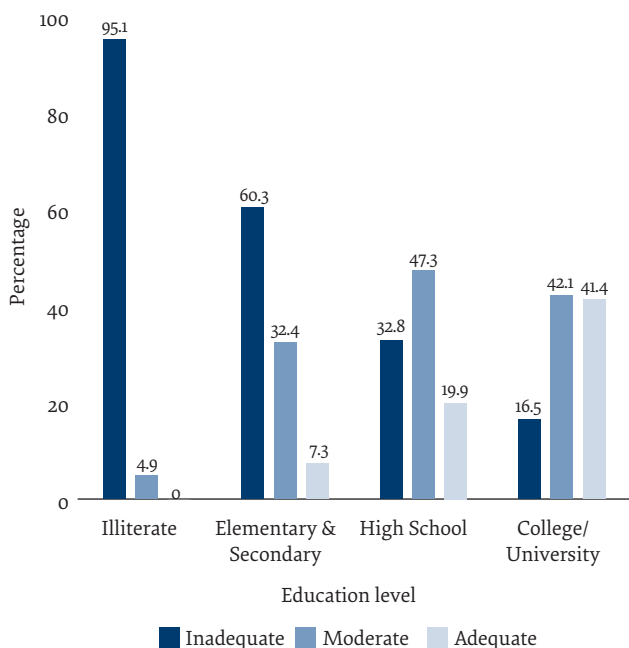


Table 2 Distribution of health literacy domain scores among Iranian adults (n = 8434)

Domain	Adequate (No.)	Moderate (No.)	Inadequate (No.)
Individual empowerment	733	1379	5775
Health information access	2473	1473	4488
Health information use (previous month)	1275	3088	4067
Health knowledge	3054	2082	3924
Interpretation/judgment skills	2295	2261	3868
Comprehension skills	2161	2635	3632
Reading skills	2721	2258	3436
Social empowerment	2774	2398	2713
Communication/decision-making skills	3903	3065	1463

women was lower than that of men, but this was reversed in the adjusted regression model (P = 0.01). There was a significant association between literacy level and health literacy level in both the crude and adjusted models, and this association increased with increasing literacy level. In the adjusted regression model, people who had a permanent job had a significantly higher health literacy level than other occupation categories. In the crude model, the health literacy score of city dwellers was higher than that of rural residents by 0.80. However, in the adjusted model, the health literacy score of rural residents was higher than that of city dwellers by 0.26, and this was statistically significant (P < 001) (Table 3).

Discussion

This was a comprehensive study of health literacy in the Islamic Republic of Iran using a culturally-specific, reliable and valid questionnaire capable of revealing a realistic representation of health literacy.

According to a recent systematic review and meta-analysis, the most common instrument used in measuring health literacy in the Islamic Republic of Iran was TOFHLA (20). As noted by Haun et al., a proper health literacy instrument should measure multiple aspects of literacy, including interaction, numeracy comprehension, reading comprehension, information search, decision-making, evaluation, responsibility, self-efficacy, and diagnosis (21); TOFHLA only addresses reading and numeracy comprehension and evaluation. Our study was performed using the IHLQ: the constructs of this questionnaire are based on the health promotion approach and, to a certain extent, it displays the features of a good health literacy instrument.

We found that about 46% of the participants had low health literacy levels which was associated with certain sociodemographic characteristics including age, sex, education, occupation status and residence (rural/urban).

Table 3 Association between health literacy and independent variables in crude and adjusted models among Iranian adults, 2015

Characteristic	Health literacy score	Simple linear regression (crude)		Adjusted	
		β	P-value	β	P-value
Age		-0.06	< 0.001	0.01	0.002
Sex					
Female	10.1	-	< 0.001	-	-
Male	10.4	0.27		-0.45	< 0.001
Education					
Illiterate	4.9	-	-	-	-
Elementary and secondary education	9.2	4.23	< 0.001	4.35	< 0.001
High school	11.3	6.35	< 0.001	6.63	< 0.001
College/university education College/University	13.1	8.15	< 0.001	8.48	< 0.001
Occupation					
Student (school/university)	11.7	-	-	-	-
Permanent job	11.4	-0.37	0.03	1.03	< 0.001
Retired	10.3	-1.41	< 0.001	0.57	0.009
Housewife/homemaker	9.6	-2.13	< 0.001	0.40	0.008
Unemployed	9.1	-2.62	< 0.001	-0.50	0.01
Temporary job	9.8	-1.94	< 0.001	0.09	0.56
Residence					
Rural	9.8	-	-	-	-
Urban	10.6	0.80	0.001	-0.26	< 0.001

Our findings were consistent with an existing body of international and national evidence. The findings of several national studies suggest a relatively low level of health literacy in the Islamic Republic of Iran (14,15,20–23). For instance, in a study among the literate urban population > 44% of participants had inadequate and only 16% had adequate health literacy levels (16).

Our finding that only 18% of the participants of this nationwide study had sufficient health literacy is very concerning given the impact of limited health literacy on people's ability to promote, protect and manage a healthy lifestyle. This has critical implications for Iranian health care professionals and policy-makers, such as in the ministries of education, culture, and health and medical education as well as in nongovernmental organizations, affecting endeavours to design a comprehensive health promotion programme to systematically improve health literacy across all societal and economic levels.

As expected, and as observed in previous studies (10,16,23–27), health literacy was significantly associated with higher levels of education. This has significant implications for health sectors given that individuals with no or little educational attainment have been shown to be 5 times more likely to engage in unhealthy behaviours, which could raise their chance of developing poorer health outcomes and widen the health gap between the least and most educated (28).

Although the most important variable influencing health literacy in our study was level of education,

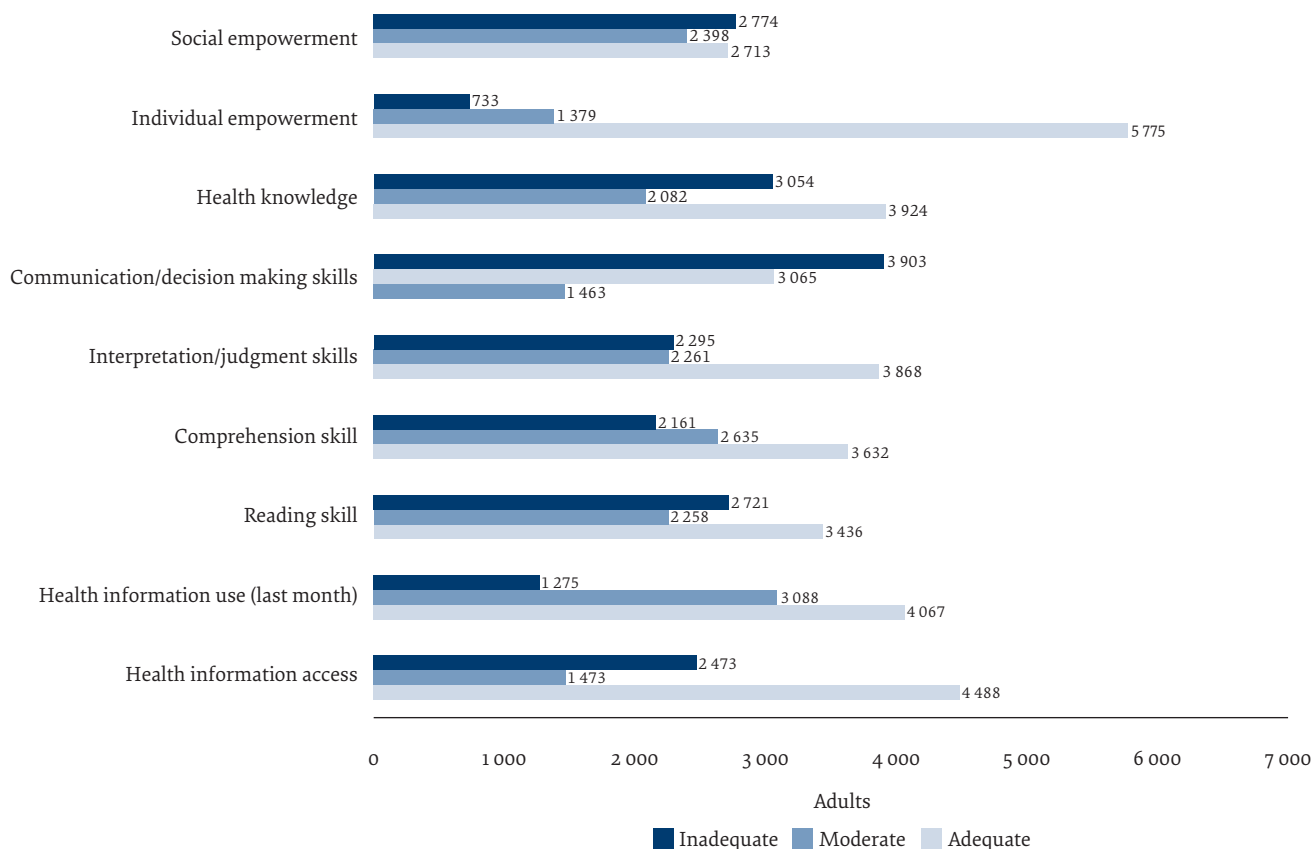
and those with higher education had better health literacy, less than half of the respondents with a college/university degree and only around one-fifth of those with a high school education had adequate health literacy. This indicates that, in addition to general education, the attendance at specific courses in the fields of health skills and health promotion in formal education are crucial to improve health literacy and health skills among communities.

We also observed that people with permanent jobs had higher levels of health literacy, which is consistent with the findings of similar studies in Australia (29), Japan (30) and Italy (31). Perhaps people with permanent jobs had better access to health information in their work environment and had more financial resources to access the health care system and health workers. It could also be attributed to the higher educational attainments required to secure a permanent job (15,32), which may affect socioeconomic status, both of which are associated with higher health literacy levels (9).

We found that some male respondents selected "housewife" as their job. This was because their wives were employed and they took the responsibility of managing the house and children. We understood that this happen in families where the wife has a good salary.

In the present study, the adjusted health literacy among Iranian women was slightly higher than among men, which is in line with the results of similar studies elsewhere (23,32–35). Such a difference could be due to the

Figure 3 Distribution of health literacy domain scores among Iranian adults (n = 8434)



greater use of health information resources by women, higher rates of reporting health issues and seeking care, and their familiarity in navigating the health care system. Moreover, most women included in our study were housewives/homemakers (77.7%), who are more likely to be exposed to educational materials broadcast on multimedia.

Additionally, health literacy levels showed a slight increase with older age. This is inconsistent with the results of other studies, which were conducted using TOFHLA (16,23,6,27,29,36,37). This may be due to differences in the type of questionnaires used: TOFHLA measures the abilities of individuals in clinical behaviours. This may also be due to the higher familiarity among youth with new science and technology. Our findings are also consistent with the findings of Barber et al., who used the Rapid Estimate of Adult Literacy in Medicine (REALM) questionnaire (29). This may be a result of the increased experience of individuals in dealing with health-related determinants and the improvement in their communication, judgment and decision-making skills, which come with older age. It should be noted that the IHLQ has relative similarity in content with the REALM questionnaire.

In this study, health literacy level was higher in rural populations than in city dwellers, which is inconsistent with the findings of Banihashemi et al. (23,38). This is probably due to the differences between the questionnaires used in the 2 studies. In the IHLQ, the

ability to access and use health resources is specifically assessed in domains of health literacy. The use of health-related resources is more prevalent in rural than in urban areas. Rural populations have greater and easier access to physicians and health care workers – 2 important sources of health information. This difference may be due to the family physician programme, although there is a need for further studies. At the time we conducted the study, the family physician programme had been operating for 10 years (in the rural areas of the country only).

This survey had several limitations. Although the sample was large and nationwide, the home-based nature of the sample, where some potential participants were not at home, may to some extent have limited the study’s generalizability and introduced bias. Moreover, social desirability bias could not be ruled out owing to the self-reported nature of the data. The anonymity of the questionnaires and the use of experienced interviewers, however, may have encouraged the participants to provide honest responses. On the other hand, the high response rate in our study (~94%) suggests the suitability of the questionnaire and the proper implementation of the research process. Moreover, the large sample size and diversity of sampling points in this study increases the reliability of the results. Overall, given the scope of the study, we believe our findings have important implications for both health research and policy in the Islamic Republic of Iran.

Conclusion

Our findings showed that about 46% of adults have a low HL level. This can affect the ability of people in promoting, maintaining and managing their health. Therefore, at policy-making and decision-making levels, strategic planning for improving HL should focus on increasing literacy in the population, providing permanent job opportunities, improving individual empowerment, health information access, health information use and interpre-

tation/judgment skills, and targeting urban areas. Given the different results yielded using different HL tools, future HL studies in the Islamic Republic of Iran could benefit from, and should utilize, culturally-sensitive and context-specific HL tools.

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Competing interests: None declared.

Les connaissances en santé chez les adultes iraniens : résultats d'une enquête en population nationale menée en 2015

Résumé

Contexte : Les connaissances en santé comptent parmi les déterminants les plus importants de la prévention des maladies non transmissibles. Elles sont associées à des risques élevés de détérioration de l'accès aux soins, de résultats défavorables pour la santé et d'augmentation des coûts d'hospitalisation et de santé.

Objectifs : La présente étude visait à déterminer le niveau de connaissances en santé parmi la population adulte générale en République islamique d'Iran.

Méthodes : Dans le cadre d'une étude transversale menée en 2014-2015 selon une approche d'échantillonnage en grappes à plusieurs degrés, nous avons administré un questionnaire normalisé mis à l'essai afin d'évaluer les différents domaines de connaissances en santé (lecture, compréhension, communication/prise de décision et compétences en interprétation/jugement, autonomisation sociale, accessibilité et utilisation de l'information sanitaire et utilisation de cette dernière) chez 8439 personnes (3935 hommes) âgées de 18 à 60 ans. Les données ont été recueillies lors d'entretiens en présentiel. Des statistiques descriptives et une méthode de régression linéaire multivariées ont été appliquées au moyen du SPSS (2.0) pour identifier les facteurs associés aux connaissances en santé chez les adultes iraniens.

Résultats : Le niveau moyen de connaissances en santé était de $10,2 \pm 3,8$ (sur 20). Seuls 18 % des participants (intervalle de confiance à 95 % [IC] : 17,15-18,78) présentaient un niveau de connaissances en santé suffisant, alors que 45,7 % (IC à 95 % : 44,64-46,78) avaient un niveau insuffisant, et 36,3 % (IC à 95 % : 35,21-37,33) affichaient un niveau modéré de connaissances en santé. Dans le modèle de régression linéaire ajusté, le niveau d'éducation (plus petit $\beta = 4,35$, valeur $p < 0,001$), l'âge ($\beta = 0,01$, valeur $p = 0,002$), le sexe féminin ($\beta = 0,45$, valeur $p < 0,001$), la résidence en zones rurales ($\beta = 0,26$, valeur $p < 0,001$) et le fait d'avoir un emploi permanent ($\beta = 1,03$, valeur $p < 0,001$) étaient associés de manière significative à un niveau plus élevé de connaissances en santé.

Conclusion : Les résultats mettent en évidence le niveau insuffisant de connaissances en santé dans la population iranienne adulte, ce qui appelle à la mise en place de plans éducatifs en amont et en aval afin d'améliorer le niveau de connaissances en santé. Ces plans devraient accorder une attention particulière à certaines sous-populations (par exemple les populations analphabètes) et certains sous-domaines (par exemple l'autonomisation des individus).

محو الأمية الصحية بين البالغين الإيرانيين: نتائج لمسح سكاني وطني في عام ٢٠١٥

علي أكبر حقدوست، محمد كاراموزيان، إنسيه جمشيدى، حميد شريفى، فاطمة رخشاني، ناديه مشايخي، حميد رضا رصافياني، فاطمة هرفته، منصور شيري، محمد علي كل، حسين علي ستوده، أتوسا سليانيان، فاطمة توكلي، عابدين إيرانبور

الخلاصة:

الخلفية: يُعدُّ محو الأمية الصحية أحد أهم محددات الوقاية من الأمراض غير السارية. وترتبط الأمية الصحية بارتفاع المخاطر الصحية بسبب ضعف فرص الحصول على الرعاية، ووقوع نتائج صحية ضارة، وزيادة العلاج في المستشفيات والتكاليف الصحية.

الأهداف: هدفت هذه الدراسة إلى تحديد مستوى الإلمام الصحي بين عامة البالغين في إيران.

طرق البحث: من خلال دراسة مقطعية أجريت خلال الفترة ٢٠١٥-٢٠١٤ واعتمدت نهجًا متعدد المراحل لاختيار عينات عنقودية، أجرى الباحثون استبانة موحدة لاختبار ارتيادي من أجل تقييم المجالات المختلفة للإلمام الصحي (أي القراءة والفهم والتواصل، صنع القرار ومهارات التفسير، الحكم والتمكين الفردي والاجتماعي، الوصول إلى المعلومات الصحية، الاستفادة من المعلومات الصحية والمعرفة الصحية) بين ٨٤٣٩ فردًا (٣٩٣٥ رجلًا) ممن تتراوح أعمارهم بين ١٨ و ٦٠ عامًا. وقد جمعت البيانات من خلال المقابلات وجهاً لوجه. وطبقت إحصاءات وصفية وطريقة انحدار خطي متعددة المتغيرات باستخدام برنامج SPSS (٢٠) لتحديد العوامل المرتبطة بالإلمام الصحي بين البالغين الإيرانيين.

النتائج: كان متوسط الإلمام الصحي $10, 2 \pm 3, 8$ (من 20). وكان 18٪ فقط (95). وكان $CI = 17, 15 - 18, 78$ ٪. وكان 45, 7٪. $CI = 44, 64 - 46, 78$ ٪. (95). في حين أن 36, 3٪. $CI = 35, 21 - 37, 33$ ٪. (95). كان لديهم إلمام غير كاف، و $\beta = 4, 35$ ، قيمة الاحتمال $(p < 0, 001)$ ، والعمر لديهم إلمام متوسط المستوى. في نموذج الانحدار الخطي المعدل، كان مستوى التعليم (الأصغر $\beta = 4, 35$ ، قيمة الاحتمال $(p < 0, 001)$ ، والإقامة في المناطق الريفية $\beta = 0, 26$ ، قيمة الاحتمال $(p < 0, 001)$ ، و $\beta = 0, 45$ ، قيمة الاحتمال $(p < 0, 001)$ ، و $\beta = 1, 03$ ، قيمة الاحتمال $(p < 0, 001)$ ، ومن لديهم وظيفة دائمة $(p < 0, 001)$ ، و $\beta = 1, 03$ ، قيمة الاحتمال $(p < 0, 001)$ كانوا مرتبطين ارتباطاً وثيقاً بمستوى أعلى من الإلمام الصحي.

الاستنتاجات: أبرزت النتائج التي توصلنا إليها أن البالغين الإيرانيين ليس لديهم مستوى كاف من الإلمام الصحي مما يتطلب وضع خطط تعليمية شاملة من المنبع وحتى المصب لتحسين مستوى الإلمام الصحي. ويجب أن تولي هذه الخطط التعليمية اهتماماً خاصاً لبعض التجمعات السكانية الفرعية (مثل الأميين) ومجالات الإلمام الصحي (مثل التمكين الفردي).

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