



Through the establishment of new WHO Country offices in the Gulf Region and the assignment of dedicated representatives, WHO aims to deliver on its technical, advocacy and convening role, advancing research, health and well-being of the countries' populations, as well as fostering public health collaboration at the national, regional and international levels

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Eastern Mediterranean Region Vision 2023 and expansion of WHO presence at country level: new WHO offices in Bahrain and Kuwait

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Forty years after signing with the World Health Organization (WHO) the Basic Agreement for cooperation, the WHO Eastern Mediterranean Regional Office (WHO/EMRO) is developing three new country offices: the first in Kuwait, which was inaugurated on 15 June 2021 (1), the second in Bahrain with a planned inauguration on 25 July 2021, while the third is planned to follow soon in Qatar.

The expansion of WHO/EMRO's presence in these countries follows from the commitments made in the EMR Vision 2023 by the Regional Director, Dr Ahmed Al-Mandhari, to “bring WHO closer to its Member States” (2), exploit regional opportunities to cooperate and engage with regional resources. It is in full line with the 13th WHO Global Programme of Work (GPW13) objectives and strategic shifts proposed by the Director General of WHO transformative agenda on expanding partnerships, focusing on countries and working with a differentiated approach to engagement as per the country context (3) and needs, moving towards the achievement of the Sustainable Development Goals and Agenda 2030 (3).

In fact, WHO/EMRO had always provided technical support and engaged in policy dialogues and capacity development initiatives with the three countries, through important high level advocacy meetings, innovative technical initiatives, and dedicated desk officers based in WHO Saudi Arabia country office and the Regional Office.

More recently, the commitments towards the 2030 Agenda for Sustainable Development and the commitment of all countries to achieve health-related Sustainable Development Goals (SDGs) (4) have highlighted the need for closer cooperation. Bahrain and Kuwait's national development visions and national health strategies are aligned with the SDGs and positioned health at the centre of their national strategies. Moreover, both countries expressed high-level commitment to Universal Health Coverage (UHC), signing in 2018 the landmark Salalah Declaration joining the UHC 2030 compact (5) and to have primary health care (PHC) at the centre of their health strategies. Thus, focusing family medicine practice, integrating noncommunicable diseases (NCDs), immunizations targets, adopting multisectoral approaches to address the social and environmental determinants of health, and developing national action plans for health security.

The commitment to provide high level quality of care and access to all residents in Bahrain and Kuwait was soon faced with increasing costs (6), a push for hospital-based care with expanding tertiary and specialized care, plus an appetite for advanced technology and costly medicines. The sharp increase in the health-care bill was considered a signal for health sector reforms, and the commitment to UHC (7) for the exploration of mandatory social/health insurance. Health-care financing and the support to study National Health Accounts, along with the provision of technical advice and support for the implementation of best strategies and practices, became a priority for the collaboration between WHO and the two countries. Challenges in retaining and developing a sustainable health workforce (8) for health care and for public health (9) require the development and implementation of forward looking, evidence based and realistic strategies in each of Bahrain and Kuwait, a domain WHO/EMRO has been closely involved with over the past few years.

With NCDs becoming the major contributors to morbidity/mortality burden in the Region (10), and overtaking communicable diseases, the decision-makers in Bahrain, Kuwait and Qatar acknowledged that the provision of health services, even of the best quality, will be too little and too late to address the burden on their populations and health systems in relation to diabetes, cardiovascular diseases, obesity and cancer (11). The conviction that the key risk factors are more behavioural/lifestyle, related to tobacco use, unhealthy diet and physical inactivity required the countries to adopt more comprehensive approaches to face the increasing burden of NCDs, to collect more data through surveys and better surveillance mechanisms, and to engage with other sectors on the implementation of the “Best Buys”, including the implementation of regulations and development of better policies based on factual and clearer understanding of how the social, economic, commercial and environmental determinants affect and interact with targeted interventions (12). These programmes require a closer cooperation with WHO (13) and the development of proper monitoring mechanisms and community information and engagement campaigns (14).

Although the plans to establish offices in Bahrain, Kuwait and Qatar had started few years ago, the COVID-19 pandemic accelerated the processes. The country

presence of WHO has come at a very opportune moment as health has been catapulted to centerstage due to the new intersectoral dynamics brought in by the pandemic response. The implications of the pandemic on all sectors plus the high management level, preparedness and scope of national responses to COVID-19 required from all concerned, including the ministries of health and WHO Regional office, demand strong coordination, regional solidarity and cooperation as well as appreciation of the joint cross operational and technical support.

WHO country offices and ministries of health can utilize the leverage attained during this period to ensure inclusion of “health in all policies”, and further build on the new skill set acquired to deliver in a multisectoral environment. WHO is keen on advancing and supporting further Investments in research and documenting evidenced-based policies that rely on data. Working with ministries of health and relevant national institutions, WHO will support the implementation of formal national mechanisms for enhancing evidence-informed policy-

making with flagship programmes, aiming to expand the capacity for analysis and reporting of health data, conducting research capacities, adopting innovations and leveraging advances in digital health, linking with academia, and establishing centres of excellence and fostering utilization of collaborating centres. Through its country presence, WHO will not only be in a position to assist the respective governments more efficiently, but also will facilitate advocacy for solidarity in support of WHO initiatives and for mobilizing resources in a more harmonized manner.

Through the establishment of new WHO country offices and assignment of dedicated representatives, WHO aims to deliver on its technical, advocacy and convening role, strengthening its advisory presence and cooperation with respective national authorities, advancing the health and well-being of countries' populations, and fostering public health collaboration at the national, regional and international levels.

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Robustness of and challenges to public health colleges: the case of Somalia

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Somalia: public health in context

War is a public health issue (1). Somalia's health infrastructure has been completely destroyed by the civil war that broke out in 1990 (2). As a result, and as expected in war zones, Somalia's health status has drastically declined. Droughts, famines, outbreaks (of disease or fighting, for example) and economic decline have exacerbated the situation (3).

In armed conflicts, health services focus on treating the injured and the sick. Preventive and health promotion activities are greatly reduced (4). Lack of basic life needs (e.g. water, food and shelter) is the main concern of the people in war. Immunization, clean water, personal hygiene and maternal health, although essential for disease prevention, are the least of their concerns. Therefore, the result of the civil war in Somalia was an inevitable increase in mortality and morbidity across the country.

The international community, collaborating with local people, has always supported Somalia in its search for peace and health promotion.

In recent years, the Somali people have shown a great interest in establishing universities in Somalia offering opportunities for ambitious students. Surprisingly, Somalia has more universities than its neighbouring countries Kenya and Ethiopia, which have 58 and 36 universities, respectively; Mogadishu, the capital of Somalia, alone, is reported to have about 40 universities (5).

In a 2013 survey of 44 universities in Somalia, 7005 students were enrolled in the faculty of public health and health studies (6). Students enrolling in public health colleges are increasing although a regional variation is observed (6). This awakening shows that people in Somalia recognize the need for early prevention strategies rather than reaction after an outbreak. This is a Somali, post-conflict public health era. An era of prevention rather than hospitalization.

Building a generation: public health colleges

Proper university education and rigorous training of the students pursuing public health can bring a rapid, positive change in Somalia's health status. Although universities offering a degree in public health exist in Somalia, the quality of such courses may be questioned (6). Individuals, organizations and local authorities that have played a role in establishing those colleges in Somalia should be applauded for their efforts.

These public health colleges bring the opportunity to empower students to lead and conduct scientific studies that can contribute to better health in Somalia. Furthermore, with their passion and enthusiasm, the graduates, if properly supported, will soon envision successful disease prevention, elimination and eradication strategies suitable for Somalia's long-lasting health problems.

Limited funding, shortage of qualified staff and lack of or limited research publications are major challenges faced by universities in Somalia. Despite the challenges and civil unrest a country or region suffers, investing in and educating the new generations always revives hope and peace. Therefore, national, and particularly international, support is important in Somalia's public health education endeavour.

Barriers to academic research development

Currently, little research is conducted by higher education institutions in Somalia (5,6) due to a number of barriers as listed below (3,5).

Limited or lack of qualified staff. The shortage or sometimes the absence of experienced researchers in educational institutions is a constraint in the production of health research in Somalia. Factors such as knowledge of English, internet access and access to the literature are major barriers for Somali researchers (5).

Limited funding. Universities receive limited funding from the government (5,6). It is reported that "the education sector receives 4.6% of the [federal] budget"

and that the “majority” of that budget “goes to primary education” (5).

Poor national and regional research agenda. With the right national agenda, research can accelerate Somalia’s development and help the country’s health recovery. However, the federal and regional governments are not involved in academic research therefore researchers receive no incentives (5).

Lack of support and collaboration. Some international research collaboration has been initiated in Somalia. However, quality standards of the Somali universities and insecurity are major barriers (5).

The international community: forgotten roles and responsibilities

When international humanitarian operations are mentioned in Somalia, drought, famine and other health emergencies come to mind. Although the importance of those operations in such life-threatening situations cannot be underestimated, the fact is that Somalia doesn’t just need food, medical supplies and global health volunteers, it also requires intellectual support.

International support for Somalia’s public health colleges could include the following undertakings.

- Health research development through funding research projects of the universities and local research organizations. Moreover, international research or-

ganizations and universities (wherever they are) should reach out to public health colleges in Somalia for collaboration.

- Virtual communications with opportunities for events such as training, seminars, symposiums, and conferences to give students an invaluable opportunity to learn from the experiences in other parts of the world.
- Academic exchange with opportunities for research fellowships and postgraduate studies for Somali researchers.

All forms of international support are vital for the improvement of public health education in Somalia.

The future: what lies ahead?

Establishing public health colleges in Somalia is a sign of a brighter future for the Somali people who have suffered major health emergencies.

National public health strategies will be more effective when sufficient data are generated by extensive scientific research in every city, town and village in Somalia conducted by well-trained local researchers.

Public health students in Somalia are the future of the country’s public health workforce that will flatten the curve of many health issues, and Somalia urgently needs that.

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Survival of patients with urinary bladder cancer in Jordan, 2005–2014

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Abstract

Background: Urinary bladder cancer is the fourth most common cancer in Jordan. No research on survival from bladder cancer at the national level has been conducted before.

Aims: This study aimed to estimate the probability of survival in patients with bladder cancer in Jordan and identify factors associated with survival.

Methods: Data were obtained from the database of the Jordan cancer registry. All cases of urinary bladder cancer in Jordanians registered during 2005–2014 were included in the study ($n = 2139$). Data collected for each case included: age, sex, date of diagnosis, and stage and grade at diagnosis. Actuarial life table survival analysis was used to determine the overall survival probabilities. Cox proportional hazard regression was used to identify independent factors associated with survival.

Results: The overall 1-, 3-, 5- and 10-year survival probabilities for urinary bladder cancer were 85%, 73%, 69% and 59%, respectively (standard error = 0.01 for each). No significant difference in survival probabilities was found between males and females ($P = 0.642$). The overall survival probabilities decreased significantly as age at diagnosis increased ($P < 0.005$). Better survival was observed in patients with early stage and well differentiated tumours at diagnosis.

Conclusions: The survival of patients with bladder cancer in Jordan is comparable to that reported from developed countries. A high percentage of data was missing and the reporting of some variables was inconsistent. To improve the quality of cancer data, regular training is needed for hospital focal points on recording complete data.

Key words: urinary bladder cancer, survival analysis, life tables, Jordan

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Introduction

Urinary bladder cancer is a form of cancer primarily arising in the tissues of the urinary bladder. It is the most common malignancy of the urinary system. There are three main types of bladder cancer: transitional cell carcinoma, squamous cell carcinoma and adenocarcinoma (1). Urothelial (transitional cell) carcinoma is the most common histological type of bladder cancer, accounting for almost 90% of all cases. Squamous cell carcinoma accounts for about 4% of cases of bladder cancer, adenocarcinoma for about 2% and all other types for about 4% of cases (2).

According to the global cancer statistics, bladder cancer is the 10th most common cancer in the world, with an estimated 549 393 new cases and 7.2/100 100 population crude death rate in 2018 (3,4). About 60% of all bladder cancer cases and 50% of bladder cancer deaths occur in the less developed regions of the world (5). Greece is reported to have the highest rates of bladder cancer among men with an age standardized rate of 40.4 cases per 100 000, while Lebanon has the highest rate among women with 9.4 cases per 100 000 in 2018 (6). According to the National Cancer Institute in the United States of America (USA), urinary bladder cancer is the

sixth most common cancer in the country, accounting for 4.7% of new cases of cancer and 2.8% of all cancer deaths in 2017 (7). The 5-year, 10-year and 15-year survival rates were 77.3%, 70.0% and 65.0%, respectively (8). Survival rates varies significantly among age groups. The overall 5-year survival decreased significantly from 90.8% in patients younger than 50 years to 81.3% in patients older than 50 years (9). In Sweden, the 5-year relative survival rate for 31 266 patients (74% men, 26% women) with urinary bladder cancer diagnosed from 1997 to 2011 was 72% (10). In the Islamic Republic of Iran, the 1-, 3-, 5- and 10-year relative survival rates for 514 patients from 2001 to 2009 were 89.9%, 71.3%, 57.5%, and 24.6%, respectively. Significant differences in survival rates among age groups and treatment types were also found. Older patients had lower survival rates. Patients who received chemotherapy or radiotherapy alone had lower survival rates than those who received combination therapy (radiotherapy and chemotherapy) (11).

In Jordan, urinary bladder cancer is the fourth most common cancer with 537 new cases reported in 2018, accounting for 4.9% of all cancer cases diagnosed (3). In 2013, the annual report of the Jordan cancer registry shows that 4.1% of cancer deaths were due to bladder

cancer (4). However, no research on survival from urinary bladder cancer at the national level has been conducted before. Our study is the first to assess the survival of patients with urinary bladder cancer in Jordan. The main objectives of this study were to estimate the probability of survival in patients with bladder cancer in Jordan and identify factors associated with survival.

Methods

Study design and population

This was a survival analysis of patients with bladder cancer. All Jordanians with urinary bladder cancer registered in the Jordan cancer registry between 2005 and 2014 were included in this study. The Jordan Cancer Registry has a CanReg format. The registry has focal points in each hospital assigned to obtain all needed data for any case of cancer and report it to the cancer registry. All diagnosed urinary bladder cancer cases are notified and registered in the Jordan cancer registry.

Data collection

The data collected included: personal information (age, sex and national identification number), demographic information (telephone number, address and nationality) and tumour information (stage, grade, date of diagnosis, primary site and histology). All data from this study were obtained from the national cancer registry.

The date of the last contact for all cases was 30 October 2017 which is when our data were obtained from the Jordan cancer registry database. The vital status (whether the case had died or survived) and the date of death were obtained from the civil registration department, which is updated yearly using the national identification number for all cases.

The follow-up period was calculated by subtracting the date of diagnosis from the date of death for the cases that died, and subtracting the date of diagnosis from the 30 October 2017 (the last updated date for vital status in Jordan cancer registry) for those who had survived until the last date of check-up. The end point of the follow-up was death. We assumed that bladder cancer was the cause of death for the cases that died in the study population. However, there might be other underlying causes of death apart from cancer because the cancer registry does not have full access to data on specific cause of death.

Data analysis

We used SPSS, version 20 to analyse the data. We used actuarial life table survival analysis to determine overall survival probabilities over time. We also computed separate life tables according to relevant variables such as stage and grade of cancer at diagnosis, and age and sex of the case. We used Cox proportional hazard regression analysis to identify independent factors related to survival. A P -value ≤ 0.05 was considered statistically significant. We used RGui, 2.15.1 to plot the overall survival with confidence intervals in Figure 1. We used GraphPad

Prism 5 to plot survival by sex, age, and cancer grade and stage in Figures 2 and 3.

Ethical considerations

Ethical approval was obtained from the Institutional Review Board in Jordan University of Science and Technology (IRB # 6/111/2017), the Jordanian Ministry of Health and the deanship of research committee (research no. 20170382).

This research was based on a secondary analysis of national data from the cancer registry. We neither obtained nor used individual names and identifiers in our analysis. The need for informed consent was therefore waived by the review bodies mentioned above.

Results

Characteristics of the cases

A total of 2139 patients diagnosed with urinary bladder cancer were registered in the Jordan cancer registry during the period 2005–2014. Men accounted for 87.8% of the cases. More than 60% of the patients were older than 60 years at diagnosis in both sexes. For all patients (males and females combined), the median age at diagnosis was 63 years, inter-quartile range (IQR): 52–74. The demographic and clinical characteristics according to sex are shown in Table 1. Most patients (57.7%) had localized tumours. The greatest proportion for both men and women were poorly differentiated tumours, 38.4% and 30.7%, respectively. Of all patients diagnosed between 2005 and 2014, 35.4% had died by the end of 2017.

Overall survival

We included 2083 patients in the survival analysis: 56 patients were excluded because of missing data on follow-up time. The patients were followed to the last date of observation: 30 October 2017 if the patient was alive and the date of death if the patient had died. Follow-up time ranged from a few months to 12.8 years with a median of 5 (IQR: 2.3–8.2) years. The overall 1-, 3-, 5- and 10-year survival probabilities for urinary bladder cancer were 85%, 73%, 69% and 59%, respectively with standard error of 0.01 for each (Table 2 and Figure 1). Just over half (55%) of the patients were alive at the end of the follow-up period.

Survival by sex and age group

The difference in survival probability between males and females was insignificant ($P = 0.642$) (Figure 2A). The overall survival probabilities decreased significantly as the age increased (Figure 2B). Patients younger than 50 years had significantly higher overall survival probabilities compared with the older age groups: the 1-, 3-, 5- and 10-year survival probabilities decreased significantly from 93%, 87%, 85% and 80% for those aged < 50 years to 77%, 61%, 53% and 43%, respectively, for those aged ≥ 70 years ($P < 0.001$).

Survival probability decreased in females with increasing age, but the difference was not statistically

Table 1 Characteristics of patients diagnosed with urinary bladder cancer between 2005 and 2014, according to sex, Jordan

Characteristic	Females (n = 261)	Males (n = 1878)	Total (n = 2139)
	No. (%)	No. (%)	No. (%)
Age (years)			
19–49	43 (16.8)	316 (17.0)	359 (16.9)
50–59	39 (15.2)	373 (20.0)	412 (19.5)
60–69	70 (27.3)	558 (30.0)	628 (29.7)
≥ 70	104 (40.6)	615 (33.0)	719 (33.9)
Mean (SD)	64 (24–94)	63 (19–94)	63 (13.2)
Median (IQR)	66 (55–72)	64 (54–72)	65 (54–72)
Marital status			
Single	9 (3.6)	31 (1.7)	40 (2.0)
Married	215 (86.0)	1745 (97.5)	1960 (96.1)
Other	26 (10.4)	14 (0.8)	40 (2.0)
Year of diagnosis			
2005	31 (11.9)	148 (7.9)	179 (8.4)
2006	18 (6.9)	177 (9.4)	195 (9.1)
2007	26 (10.0)	157 (8.4)	183 (8.6)
2008	27 (10.3)	171 (9.1)	198 (9.3)
2009	22 (8.4)	185 (9.9)	207 (9.7)
2010	25 (9.6)	196 (10.4)	221 (10.3)
2011	29 (11.1)	171 (9.1)	200 (9.4)
2012	30 (11.5)	216 (11.5)	246 (11.5)
2013	17 (6.5)	213 (11.3)	230 (10.8)
2014	36 (13.8)	244 (13.0)	280 (13.1)
Status			
Alive	172 (65.9)	1162 (61.9)	1334 (62.4)
Dead	83 (31.8)	675 (35.9)	758 (35.4)
Unknown	6 (2.3)	41 (2.2)	47 (2.2)
Summary stage			
In situ	19 (7.3)	136 (7.2)	155 (7.2)
Localized	148 (56.7)	1086 (57.8)	1234 (57.7)
Regional	21 (8.0)	144 (7.7)	165 (7.7)
Distant metastasis	25 (9.6)	134 (7.1)	159 (7.4)
Unknown	48 (18.4)	378 (20.1)	426 (19.9)
Grade			
Well differentiated	56 (21.5)	418 (22.3)	474 (22.2)
Moderately differentiated	37 (14.2)	209 (11.1)	246 (11.5)
Poorly differentiated	80 (30.7)	722 (38.4)	802 (37.5)
Undifferentiated	3 (1.1)	30 (1.6)	33 (1.5)
Unknown	85 (32.6)	499 (26.6)	584 (27.3)

SD= standard deviation; IQR= interquartile range.

significant (Figure 2C). Among males, however, the decrease in survival probability with age was statistically significant (Figure 2D).

Survival by grade and stage of tumour

Figure 3A shows the differences in survival probability between the different tumour grades. Patients with well-differentiated tumours had the highest survival

probability compared with patients with other grades. Patients with poorly differentiated tumours had the lowest survival probability even when compared with undifferentiated tumours. The *P*-values shown in figure are derived from the Cox proportional hazard regression for differences in survival probability among different grades.

Table 2 Actuarial life table of cases of urinary bladder cancer diagnosed, Jordan 2005–2014

Interval (year)	No. at beginning of interval	No. withdrawn during interval	Adjusted no. at risk	No. of deaths	Proportion surviving the interval (%)	Cumulative survival proportion (%)	Standard error of cumulative survival
0	2083	8	2079.0	314	85	85	0.01
1	1761	3	1759.5	139	92	78	0.01
2	1619	41	1598.5	98	94	73	0.01
3	1480	171	1394.5	54	96	71	0.01
4	1255	157	1176.5	31	97	69	0.01
5	1067	154	990.0	31	97	67	0.01
6	882	141	811.5	25	97	64	0.01
7	716	131	650.5	22	97	62	0.01
8	563	113	506.5	17	97	60	0.01
9	433	110	378.0	9	98	59	0.01
10	314	115	256.5	4	98	58	0.01
11	195	97	146.5	5	97	56	0.02
12	93	92	47.0	1	98	55	0.02

Figure 3B shows the survival probability for the different stages of cancer at diagnosis. The earlier the stage of cancer at diagnosis, the higher the survival probability. While 97% of patients with in-situ tumours survived the first year after diagnosis, only 56% of patients with distant metastatic tumours survived the first year. The *P*-values shown in figure are derived from

Cox proportional hazard regression for differences in survival probability among different stages.

Discussion

The present study is the first in Jordan that aimed to assess the survival probability of bladder cancer in the Jordanian population at the national level. The findings

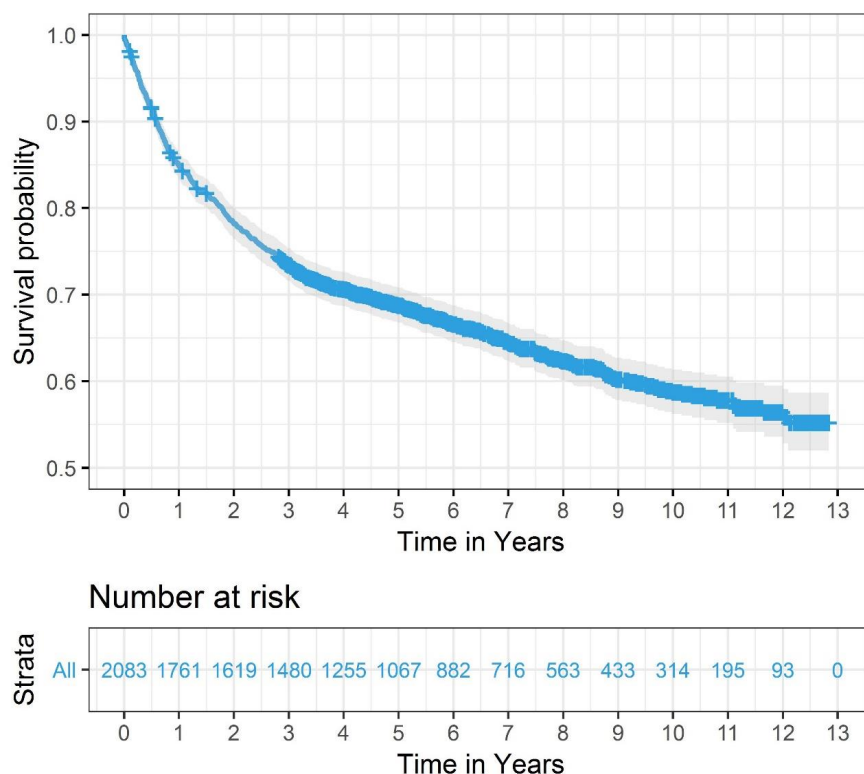
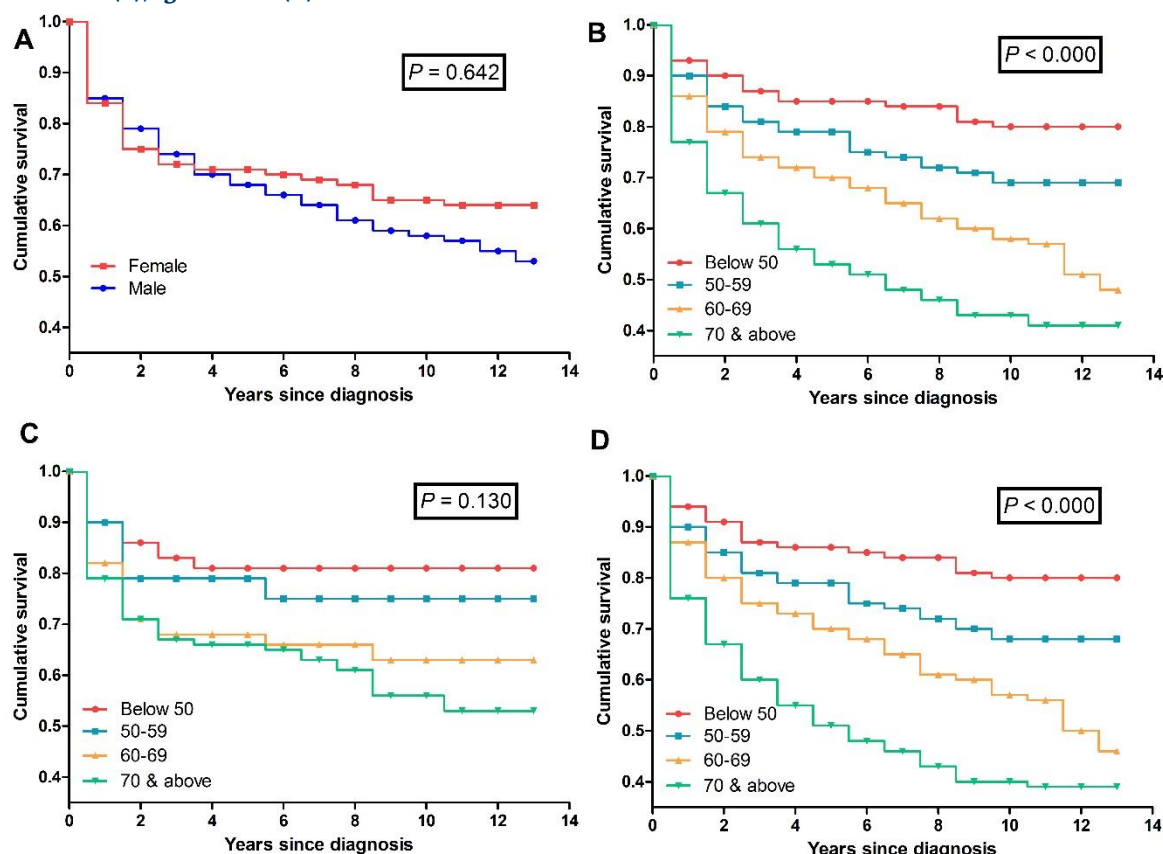
Figure 1 Overall survival curve with confidence intervals for bladder cancer, Jordan 2018

Figure 2 Survival probabilities for patients with urinary bladder cancer diagnosed during 2005-2014, Jordan, 2018, by sex (A), age (B), age in females (C), age in males (D)

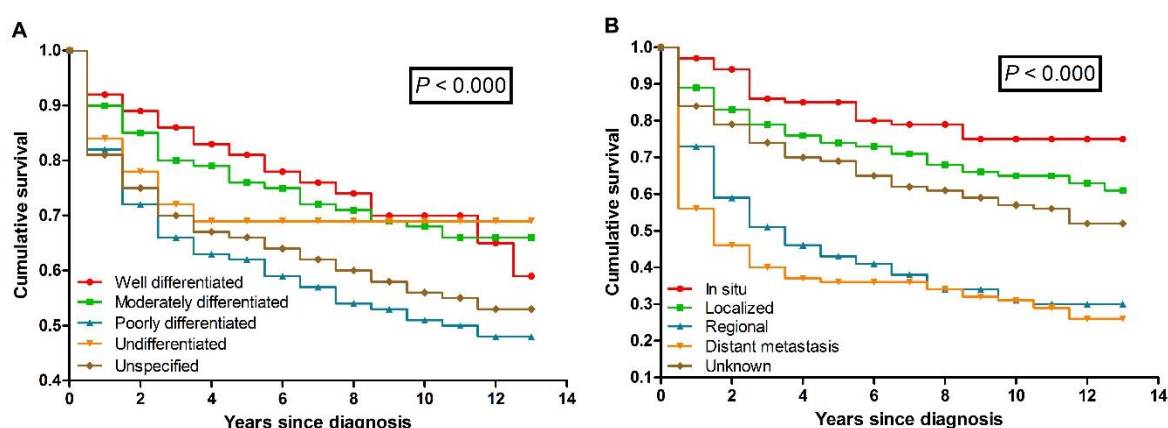


can be considered a national record because they are based on a large population and an almost consistent reporting method. All urinary bladder cancer cases in Jordanians registered in the Jordan cancer registry during 2005–2010 were included in the study. We also aimed to identify groups of the population at higher risk of lower survival.

In the USA, the 5-year survival for urinary bladder cancer was 76.8% for patients diagnosed in the period 2008–2014 (7). According to the International Agency for Research on Cancer, the 5-year survival for urinary

bladder cancer exceeded 70% in China, Singapore and the Republic of Korea compared with less than 50% survival in other countries in Asia (12). In a survival analysis study in the Islamic Republic of Iran, the 5-year survival rate was 57.5% in 514 patients who were diagnosed with urinary bladder cancer between 2001 and 2009 (11). Our study showed that the overall 5-year survival rate for patients with urinary bladder cancer in Jordan was 69%. This comparison shows that patients with urinary bladder cancer in Jordan have relatively high survival compared with other countries in Asia and comparable

Figure 3 Survival probabilities for patients with urinary bladder cancer diagnosed during 2005-2014, Jordan, 2018, by summary grade (A) and stage (B)



survival to that reported in the developed countries. The better survival in Jordan might be explained by the more advanced cancer care in Jordan compared with some neighbouring countries (13). However, the cancer grade of 27.3% of the patients in our study was unknown. If the unknown cases were better classified, it might result in a higher percentage with favourable grade and stage and hence better survival rates among our patients. Better pathological classification might shed a light on the unknown grades.

Bladder cancer was more common in males than females. According to the American Society of Clinical Oncology, men were four times more likely than women to be diagnosed with bladder cancer (14). This cancer is the fourth most common cancer in men in the USA and the eighth in the United Kingdom of Great Britain and Northern Ireland (15,16). In 2014, bladder cancer in Jordan ranked third of the top 10 cancers in men (4). Our study supports this ranking as most (87.8%) bladder cancer patients were men. Several studies have investigated differences in survival of bladder cancer by sex (17,18). In Norway, a study that included 15 129 patients diagnosed with bladder cancer between 1997 and 2011 found that men had a better prognosis than women. The 2-, 5- and 10-year relative survival rates were, respectively, 84.0%, 75.1%, and 66.3% for men and 79.6%, 71.7%, and 64.5% for women (17). A population-based cohort study that included 36 344 patients with urinary bladder cancer diagnosed between 1997 and 2014 found that women had slightly higher mortality than men. This higher mortality in women was limited to those diagnosed with muscle-invasive tumours (18). In another population-based study in Canada, the 5-year cancer-specific survival and overall survival of the full cohort of 5259 patients did not differ between women and men (19). However, our study did not find any significant difference in survival between males and females. The 5-year survival rates were 68% and 71% in males and females, respectively. This lack of difference in survival might be due to the similarity in tumour properties such as stage and grade between males and females.

Survival rates for bladder cancer are generally higher in younger patients and decrease with increasing age. Therefore, age is widely accepted as a strong and independent risk factor for developing bladder cancer. In the USA, the overall 5-year survival decreased significantly from 90.8% in patients younger than 50 years to 81.3% in patients older 50 years (9). In England, the 5-year net survival for men with bladder cancer ranged from 73% in patients younger than 50 years to 43% in patients older than 80 years during 2009–2013 (16). As expected, our study showed the same pattern as the overall survival decreased significantly as the age of the patients increased. The overall 5-year survival dropped from 85% in patients younger than 50 years to 53% in patients older than 70 years. Even after categorizing our study population into only two age groups (younger and older than 50 years), survival differed significantly between the two groups.

Different clinical and pathological prognostic factors have been proposed for survival of bladder cancer, including tumour stage, differentiation of tumour, and surgical and distant metastasis. A high proportion (80%) of bladder cancer cases in Jordan have a known stage recorded at diagnosis. Most patients (57.7%) in our study were diagnosed at stage I (localized tumour) and only 7% were diagnosed with distant metastatic tumours. In the USA about half of bladder cancer patients are diagnosed at stage I (15). Poorly differentiated tumours were the most common grade among our patients representing 37.5% of the cases. Our analysis showed that grade and stage were significant predictors of survival of bladder cancer. The probability of dying was significantly higher for those with poorly differentiated tumours compared with those with well differentiated tumours. Survival probability was much higher for patients diagnosed at early cancer stages, such as in-situ and localized tumours compared with those with regional and metastatic tumours. The 5-year survival probability dropped from 85% for the in-situ tumours to 36% for metastatic tumours. Previous studies have shown that bladder cancer survival is highly dependent on stage at diagnosis. The 5-year survival probability varied from 92.4% for localized stage cancers to 25.4% for distant metastatic cancer (9). Highly and moderately differentiated tumours had a survival probability of 93.5%, while poorly differentiated tumours had a survival probability of 65.8% (9).

Our study has some limitations. We only analysed data available at the Jordan cancer registry. This database lacks information about some risk factors (e.g. dietary factors and occupational exposure to carcinogens). Therefore, we were unable to investigate the effect of these factors. In addition, a high percentage of data was missing, and the reporting of some variables was inconsistent, such as bladder cancer type, smoking status and treatment, so it was not possible to examine the effect of those variables on the survival probability of our patients. In performing our analysis, we assumed that bladder cancer was the cause of death. However, there might be another underlying cause of death since the cancer registry does not have access to data on the specific cause of death. Therefore, our survival probability might be underestimated as deaths from other causes were included in the analysis.

Regular training for focal points at the hospitals about complete documentation and reporting is needed to improve the quality of cancer data. More attention should be paid to cancer survival, since cancer is the second most common cause of death in Jordan. For instance, a new systematic method is needed to improve patient follow-up. An annually updated database on the incidence, prevalence, mortality and survival of all cancers in Jordan needs to be developed. This database can be a trusted source of information to assess cancer treatment programmes and monitor progress of our national cancer control programme.

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Competing interests: None declared.

Survie des patients atteints de cancer de la vessie, Jordanie, 2005-2014

Résumé

Contexte : Le cancer de la vessie est le quatrième cancer le plus fréquent en Jordanie. Aucune recherche sur la survie au cancer de la vessie au niveau national n'a été menée auparavant.

Objectifs : La présente étude visait à estimer la probabilité de survie des patients atteints de cancer de la vessie en Jordanie et à identifier les facteurs associés à la survie.

Méthodes : Les données ont été obtenues à partir de la base de données du registre jordanien du cancer. Tous les cas de cancer de la vessie enregistrés en Jordanie entre 2005 et 2014 ont été inclus dans l'étude ($n = 2139$). Les données collectées pour chaque cas incluaient l'âge, le sexe, la date du diagnostic, le stade et le degré du diagnostic. On a recouru à une analyse actuarielle de la survie avec des tables de survie pour déterminer les probabilités de survie globale. La régression de Cox à risques proportionnels a été utilisée pour identifier des facteurs indépendants associés à la survie.

Résultats : Les probabilités globales de survie à 1, 3, 5 et 10 ans pour le cancer de la vessie étaient respectivement de 85 %, 73 %, 69 % et 59 % (erreur type = 0,01 respectivement). Aucune différence significative dans les probabilités de survie n'a été observée entre les hommes et les femmes ($p = 0,642$). Les probabilités de survie globale diminuaient significativement avec l'augmentation de l'âge au moment du diagnostic ($p < 0,005$). Une meilleure survie a été observée chez les patients présentant un stade précoce et des tumeurs bien différenciées au moment du diagnostic.

Conclusions : La survie des patients atteints de cancer de la vessie en Jordanie est comparable à celle rapportée dans les pays à revenu élevé. Il manquait un pourcentage élevé de données et la notification de certaines variables était incohérente. Pour améliorer la qualité des données sur le cancer, les points focaux hospitaliers doivent recevoir une formation régulière sur l'enregistrement des données complètes.

نجاة المرضى المصابين بسرطان المثانة البولية، الأردن، 2005-2014

نور عبده، مجد السخني، أنور بطيحة، كمال عرقوب

الخلاصة

الخلفية: يأتي سرطان المثانة البولية في المرتبة الرابعة بين أكثر أنواع السرطان شيوعاً في الأردن. ولم تُجر أي بحوث من قبل حول النجاة من سرطان المثانة على المستوى الوطني.

الأهداف: هدفت هذه الدراسة إلى تقدير احتمالية النجاة لدى المرضى المصابين بسرطان المثانة في الأردن، وتحديد العوامل المرتبطة بالنجاة.

طرق البحث: تم الحصول على البيانات من قاعدة بيانات السجل السرطاني الأردني. وأدرجت جميع حالات سرطان المثانة البولية لدى الأردنيين المسجلين خلال الفترة 2005-2014 في الدراسة (العدد = 2139). وتضمنت البيانات المجمعة لكل حالة: العمر والجنس وتاريخ التشخيص والمرحلة والتصنيف عند التشخيص. واستُخدم التحليل الإكتواري لجدول مجريات الحياة في تحديد احتمالات النجاة بوجه عام. واستخدم انحدار كوكس للمخاطر التناسبية في تحديد العوامل المستقلة المرتبطة بالنجاة.

النتائج: بلغت احتمالات النجاة الإجمالية من سرطان المثانة البولية بعد سنة واحدة و3 سنوات و5 سنوات و10 سنوات 85% و73% و69% و59% على التوالي (الخطأ المعياري = 0.01 لكل احتمالية). ولم يُوجد أي فرق جوهري في احتمالات النجاة بين الذكور والإناث ($p=0.642$). وانخفضت احتمالات النجاة الإجمالية انخفاضاً كبيراً مع زيادة العمر عند التشخيص ($p < 0.005$). ولوحظ تحسن في احتمالات النجاة بين المرضى في المرحلة المبكرة من المرض والمصابين بأورام متمايزة تماماً جيداً عند التشخيص.

الاستنتاجات: تضاهي احتمالات نجاة المرضى المصابين بسرطان المثانة في الأردن تلك المبلغ عنها في البلدان المتقدمة. وكانت نسبة كبيرة من البيانات مفقودة، وكان الإبلاغ عن بعض المتغيرات غير متسق. ولتحسين جودة بيانات السرطان، يلزم تدريب مسؤولي التنسيق في المستشفيات بانتظام على تسجيل البيانات كاملة.

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Inappropriate hospital stays and association with lack of homecare services

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Abstract

Background: Efforts to reduce inappropriate hospital stay, including alternatives such as homecare, are important to improve patient care and reduce health care costs.

Aims: This study evaluated inappropriate hospital stay in Shiraz, Islamic Republic of Iran and the extent to which these stays were due to lack of homecare services and others factors needed for homecare.

Methods: This cross-sectional study was conducted between January 2018 and September 2019 at two public hospitals in Shiraz. All adult patients hospitalized in these two hospitals in the study period were included, except patients in mental care wards. Appropriateness of patients' hospital stay was assessed on a daily basis using the Iranian version of the Appropriateness Evaluation Protocol. The chi-squared test was used to assess association between need for homecare and patient characteristics.

Results: Of 6458 hospitalization days assessed (for 1954 patients), 710 (11.0%) days were inappropriate. The greatest proportion of causes of inappropriate stay were physician-related (32.9%). Of the 710 inappropriate hospitalization days, 231 were due to lack of homecare services. Most patients who were inappropriately hospitalized because of lack of homecare services were insured through Salamat insurance (64.0%). A statistically significant relationship was found between the need for homecare services and the type of health insurance ($P = 0.01$). Of the patients admitted to hospital because of lack of homecare services, 36.8% had endocrine diseases, especially diabetes, and 21.8% needed oxygen services.

Conclusion: Institutionalizing home health care in the Iranian health system could encourage more home health care referral and reduce inappropriate hospitalization, especially for diabetes.

Keywords: hospitalization, length of stay, homecare services, Iran

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Introduction

Hospitals are the main providers of health care services and play an important role in improving patients' physical and mental health. However, they account for the highest proportion of health care expenditure (1). As a result of demographic changes in recent years (ageing population), demand for hospital beds has increased (2,3). Data also show that 10–30% of hospital admissions are unnecessary (4). Unnecessary hospitalization increases patient and health system costs, reduces patient access to critically required resources and increases the risk of nosocomial infections in patients (5). In addition, unnecessary hospitalization leads to absence from work, which may have consequences on the society, and to negative emotional and psychological effects on families. Reducing inappropriate use of hospital services is a way to limit health care costs without compromising the quality of services (6).

Therefore, reducing inappropriate and unnecessary use of hospital resources and unnecessary hospital stay is important. Thus, many health systems have turned

to alternative methods of providing services including home health care. Pressure from ageing populations coupled with the epidemiological transition in disease patterns to chronic illnesses in adults, economic changes and advances in technology have led to wiser provision of social and health care services at home (7,8). The World Health Organization (WHO) has also emphasized the importance of homecare services in response to the epidemiological, demographic and socioeconomic challenges the world is facing (9).

Moreover, the effectiveness of homecare programmes has been demonstrated in various studies. For example, a study in Switzerland concluded that providing home-based chemotherapy services was safe and cost-effective and was satisfactory for patients and their families (10). Furthermore, the involvement of patients with diabetes in homecare programmes has led to improved diabetes-related outcomes in these patients (11). A study in Austria showed that patients with depression who received homecare services had fewer depressive symptoms, higher quality of life and lower hospitalization costs (12).

Homecare services and post-discharge support reduce hospital stay and costs (13). In order to cope with the ageing population and the increased demand for hospital beds, home health care may be an effective solution to help reduce costs and maintain the quality of service (8).

Studies in the Islamic Republic of Iran have reported that 6.3–22.8% of hospital stays were inappropriate (14,15). Efficient and cost-effective use of resources in countries such as the Islamic Republic of Iran, where funds allocated to the health care system are limited, is vital (16). However, home health care in the Islamic Republic of Iran is faced with various challenges including insurance, medical equipment, acculturation, and the lack of an appropriate standard on the amount and the process of homecare payment (17).

Since home health care has many benefits for the patient and the health system, we aimed to evaluate the inappropriateness of patients' hospital stay and factors related to the inappropriate stay in Shiraz. We also determined whether the inappropriate hospital stay was because of the lack of homecare services and conditions, and if so, the condition these patients had and the type of services that they needed.

Methods

Study design and setting

This cross-sectional study was conducted between January 2018 and September 2019 at two public, teaching hospitals in Shiraz, Islamic Republic of Iran.

Study sample

The study population included all adult patients hospitalized in these two hospitals except for patients admitted to mental health wards. Thus, all surgical and internal wards, internal intensive care units, surgical intensive care units, cardiac care and neurological intensive care units of these two hospitals were included and followed for 252 days. Inclusion criteria were age > 18 years and at least 3 days of hospitalization.

Data collection

The appropriateness of the patient stay was assessed using the validated Iranian version of the Appropriateness Evaluation Protocol (18). The first part of this tool assesses the need for hospitalization and the second part evaluates the reasons for an inappropriate stay. The first part includes 31 criteria related to medical services, critical/nursing care services and patient's conditions that must be met for hospitalization to be appropriate. If these criteria are not met, the patient's hospitalization is unnecessary. The second part includes 34 questions on the reasons for inappropriate stay classified in four categories; factors related to: the physician, the hospital, the patient and the environment, society and other organizations.

Every day, all patients in the wards of the hospitals were entered in the study and the questionnaire was completed through review of the patients' medical records

and interviews with nurses, patients' companions and the patients themselves. Interviewers worked independently and interviewed each patient individually to complete the questionnaire.

For patients found to have an inappropriate hospital stay, we also determined whether these patients needed special care or procedures at home after discharge and if so, what services they needed.

Data were collected by qualified interviewers who had: specialized knowledge in reading patient medical records and cards; at least a bachelor degree in nursing; at least 5 years' experience in nursing services; and the ability to communicate verbally in appropriate dialects with the patients and their companions. The interviewers were trained on how to complete the questionnaire, and were assessed and approved before joining the interviewer team. In case of any ambiguity on the completion of the questionnaire, interviewers could telephone the research team for guidance/clarification.

Statistical analysis

We used SPSS, version 18 for data analysis. We present data as frequency and percentage. We used the chi-squared test to determine the significance of associations between demographic characteristic of the patients and the need for homecare services. $P < 0.05$ was considered statistically significant.

Ethical considerations

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences (IRS.MS.REC.1396.S738). After a full oral explanation of the study, we obtained written informed consent from all the patients or his/her companion. They were ensured of the confidentiality of the information by the interviewers and members of the research team.

Results

None of the patients declined to participate in the study. During the study period, 6458 questionnaires related to 1954 patients were completed and evaluated. Most patients were men (52.7%) and residents of Shiraz (57.6%). The greatest proportion (33.6%) were aged 61–80 years and almost half (49.9%) had Salamat insurance – one of the types of insurance in the Islamic Republic of Iran – (Table 1).

Of 6458 hospitalization days, 710 were considered inappropriate (11.0%). Because each day of hospitalization may have more than one reason for being inappropriate, the total reasons for inappropriate hospitalization in Table 2 are more than the 710 inappropriate days of hospitalization. The most common reasons for inappropriate stay were physician-related factors (32.9%). Lack of access to alternative care centres, failure to seek early consultation and postponement of surgery by the physician were the most common causes of inappropriate stay (Table 2).

Table 1 Demographic characteristics of the participants

Variable	No. (%), n = 1954
Sex	
Male	1029 (52.7)
Female	925 (47.3)
Place of residence	
Shiraz	1125 (57.6)
Other	829 (42.4)
Age group (years)	
18–40	439 (22.5)
41–60	624 (31.9)
61–80	656 (33.6)
81–100	235 (12.0)
Insurance type	
Salamat ^a	975 (49.9)
Social security	649 (33.2)
Armed forces	112 (5.7)
Other	38 (1.9)
No insurance	180 (9.2)

^aType of health insurance in the Islamic Republic of Iran.

Of the 710 inappropriate hospitalization days, 254 were due to lack of homecare services and conditions (unavailability of alternative service centres and/or social care centres, being without family at discharge and to provide homecare services, families' inability (financial or physical) to provide homecare services after discharge. After eliminating multi-causal hospitalization days, 231 of the 710 inappropriate hospitalization days were solely due to the lack of home care services. Patients who were inappropriately hospitalized because of lack of homecare services and conditions were mostly in the 61–80 year age range (37.6%), female (50.4%), from Shiraz (65.6%) and insured through Salamat insurance (64.0%). A statistically significant relationship was found between the need for homecare services and the type of insurance ($P = 0.01$) (Table 3).

The most common diseases of patients with inappropriate hospitalization due to the lack of homecare services and conditions were endocrine (36.8%), neurological (19.5%) and pulmonary (18.2%) diseases (Table 4).

The most common services that patients received in hospital due to the lack of homecare services were oxygen (21.8%), cleaning of sores (13.4%) and suction (13.2%) (Table 5). As each patient may be hospitalized inappropriately because of the need for several types of services, the total need for services was 417.

Discussion

To the best of our knowledge, this is the first study that shows the demand for home health care among hospitalized patients in the Islamic Republic of Iran. We hypothesized that inappropriate use of hospital may increase

because of lack of home health care and that no hospital refers patients to home health care in the Islamic Republic of Iran. We found that 11.0% of hospital patient days were inappropriate, of which 32.5% (231/710) were due to lack of home health care services. Our results concur with a study in Belgium which showed that a large proportion of patients who could be discharged (31%) were not discharged because their families were unable to provide homecare services and there were difficulties in finding rehabilitation centres and nursing homes (19). A study in the United States of America (USA) showed that 29.2% of patients discharged from hospital were referred to home health care (1). Another American study also found that 88 of 194 (45.4%) elderly patients admitted in emergency departments could have benefited from a homecare referral (20).

Home health care is still in its infancy in the Islamic Republic of Iran and is not yet well established in the health system. This shortcoming is also mentioned in the Lebanese health system (21). There is no comprehensive information system of a registered home health care in the country (22) so hospitals do not have any discharge plan for referral to home health care. Moreover, lack of standardized criteria that can be used to assess the need for home health care at discharge in Iranian hospitals might be another reason for not referring patients to home health care. As reported in a study on discharge referral decision-making, clinicians have no standardized and valid guidelines for home health care referral decisions, and use of such guidelines can support them for evidence-based decision-making (23).

Another reason for hospital stays is that home health care is not covered by Iranian health insurance plans. As our findings showed, there was a significant relationship between the insurance type and the need for homecare services. Patients who had Salamat insurance stayed in hospital although they needed homecare services because this insurance scheme covers a large percentage of patient hospital costs, but home health care is not included in the health package. In the USA, where home health care is covered by Medicare, about 30% of hospitalized patients insured through Medicare were referred to homecare centres after discharge in 2012 (1). Research shows that increasing the reimbursement of Medicare insurance for homecare services has led to an increase in the use of homecare services by the insured (24).

Our findings showed the most of the patients hospitalized because of lack of home health care had endocrine diseases, especially diabetes, and neurological diseases. Research in the USA also showed that most patients receiving homecare services from 2000 to 2007 had diabetes mellitus (10.1%) (25). A study on non-English-speaking patients in the USA found that homecare interventions were an effective way to control diabetes; after 24 months of receiving homecare services, patients had improved stability of their blood glucose, blood pressure and lipids and their outpatient visits decreased (11). As a start, Iranian health policy-makers should recommend referral of patients with diabetes and

Table 2 Factors related to inappropriate hospitalization days

Causes	No. (%)
Related to the physician	
Postponement of surgery by the physician	76 (7.4)
Failure of physician to issue a timely discharge order	42 (4.1)
Physician's lack of cooperation with the treatment team	8 (0.8)
Absence of a physician	13 (1.3)
Delays in examination and diagnosis	14 (1.37)
Patient hospitalization for physiotherapy and diagnostic services although they can access these services in outpatient clinics	13 (1.3)
No request for timely consultation	127 (12.4)
No request for timely tests and other services	45 (4.4)
Subtotal	338 (32.9)
Related to the hospital	
Problems in surgical plans	63 (6.1)
Failure of hospital to plan for timely discharge	11 (1.1)
Postponement of surgery by the hospital	12 (1.2)
Delays in test response	25 (2.4)
Delays in consultation	60 (5.8)
Defects in and breakdown of medical devices and equipment	8 (0.8)
Problems in insurance, discharge and payment	6 (0.6)
Delays in patient referral to other centres	38 (3.7)
Procedures not performed during weekends and public holidays	66 (6.4)
Early admission ^a	1 (0.1)
Subtotal	290 (28.3)
Related to the patient and his/her family	
Patient and family insistence on staying in hospital	14 (1.4)
Patient and family failure to give consent for a procedure	42 (4.1)
Patient disagreement with the treatment plan	29 (2.8)
Patient financial problems	23 (2.2)
Patient without a family available on discharge and to provide homecare services	7 (0.7)
Family unable to be available on discharge and to provide homecare services	52 (5.1)
Patient avoidance of outpatient and medical examinations ^b	2 (0.2)
Subtotal	169 (16.5)
Related to the environment, society and the organization	
Alternative service centres not available (e.g. nursing homes, rehabilitation centres and chronic diseases centres)	166 (16.2)
Social care centres not available (non-acute centres such as homecare services and sanatoriums)	29 (2.8)
Lack of low level health services ^c	14 (1.4)
Lack of outpatient diagnostic centres	9 (0.0)
Failure of outpatient centres to plan for timely discharge	5 (0.5)
Legal problems of patient discharge	2 (0.2)
Unclear destination of the patient after discharge	4 (0.4)
Waiting for admission to other hospitals or specialized centres	0 (0)
Subtotal	229 (22.3)
Total	1026 (100.0)

^aPatient is admitted earlier than needed as processes and tests that can be done before admission and hospitalization were done after hospitalization.

^bPatient avoids outpatient and periodic medical examinations and is hospitalized because recurrence of the disease.

^cPrimary care and outpatient and non-hospital health services.

neurological diseases to home health care to encourage the use home health care which can result in reduced use of hospital beds and associated care costs. An Iranian

study also reported that providing home health care for stroke patients was more cost-effective than hospital care (26). In addition, modern technologies used to treat

Table 3 Need for homecare services according to patient demographic characteristics

Variable	Need homecare services		Statistics
	Yes (n = 125)	No (n = 222)	
	No. (%)	No. (%)	
Sex			
Male	62 (49.6)	110 (49.5)	$\chi^2 = 0.00$, df = 1, P = 0.99
Female	63 (50.4)	112 (50.4)	
Place of residence			
Shiraz	82 (65.6)	128 (57.7)	$\chi^2 = 2.11$, df = 1, P = 0.14
Other	43 (34.4)	94 (42.3)	
Age group (years)			
18–40	14 (11.2)	44 (19.8)	$\chi^2 = 6.03$, df = 3, P = 0.11
41–60	42 (33.6)	81 (36.5)	
61–80	47 (37.6)	68 (30.6)	
81–100	22 (17.6)	29 (13.1)	
Insurance type			
Salamat ^a	80 (64.0)	100 (45.0)	$\chi^2 = 13.1$, df = 4, P = 0.01
Social security	29 (23.2)	73 (32.9)	
Armed forces	12 (9.6)	28 (12.6)	
Other	2 (1.6)	9 (4.1)	
No insurance	2 (1.6)	12 (5.4)	

df= degrees of freedom.

^aType of health insurance in the Islamic Republic of Iran.**Table 4 Distribution of inappropriate hospitalization days due to lack of homecare services and conditions according to disease**

Disease classification and type	No. (%)
Diseases of the liver	
Jaundice	1 (0.4)
Acute hepatic failure	1 (0.4)
Skin diseases	
Skin grafting	1 (0.4)
Endocrine diseases	
Diabetic foot	10 (4.3)
Acute complications of diabetes mellitus	71 (30.7)
Post-thyroidectomy	4 (1.7)
Gastrointestinal disease	
Bowel obstruction	1 (0.4)
Gastrointestinal or rectal bleeding	6 (2.6)
Poisoning	4 (1.7)
Cardiovascular disease	
Hypertension	1 (0.4)
Congestive heart failure or heart failure	6 (2.6)
Atrial fibrillation	1 (0.4)
Renal disease	
End-stage renal disease	2 (0.9)
Ure sepsis	3 (1.3)
Radical cystectomy	1 (0.4)
Urinary tract infection	1 (0.4)
Renal failure	1 (0.4)

Table 4 Distribution of inappropriate hospitalization days due to lack of homecare services and conditions according to disease (continued)

Disease classification and type	No. (%)
Percutaneous nephrolithotomy	1 (0.4)
Transurethral resection of the prostate	1 (0.4)
Neurological disease	
Cerebrovascular accident	21 (9.1)
Loss of consciousness	6 (2.6)
Headache or vertigo	2 (0.9)
Central nervous system vasculitis or vasculitis	3 (1.3)
Cranioplasty	2 (0.9)
Cervical cord injury	2 (0.9)
Brain abscess or brain mass	2 (0.9)
Epilepsy	2 (0.9)
Amyotrophic lateral sclerosis	2 (0.9)
Myasthenia gravis	1 (0.4)
Alzheimerdisease	1 (0.4)
Cerebralischemia	1 (0.4)
Pulmonary disease	
Pulmonary embolism	2 (0.9)
Pleural effusion	2 (0.9)
Chronic obstructive pulmonary disease	8 (3.5)
Pneumonia	16 (6.9)
Pneumo-thromboembolism	2 (0.9)
Respiratory arrest	2 (0.9)
Asthma	4 (1.7)

Table 4 Distribution of inappropriate hospitalization days due to lack of homecare services and conditions according to disease (concluded)

Disease classification and type	No. (%)
Dyspnoea or dyspnoea after coronary artery bypass grafting	5 (2.2)
Lung fibrosis	1 (0.4)
Internal infectious	
Sepsis	1 (0.4)
Infection	1 (0.4)
Influenza	1 (0.4)
Oedema	1 (0.4)
Skeletal disease	
Septic arteritis	1 (0.4)
Becker muscular dystrophy	2 (0.9)
Camurati–Engelmann disease	3 (1.3)
Ischium	1 (0.4)
Gynaecological disease	
Breast cancer	3 (1.3)
Unknown diagnosis	13 (5.6)
Total	231 (100.0)

and reduce diabetes complications (both outpatient or at home) can easily replace hospital care services.

We found that patients whose stay in hospital was inappropriate were there to receive services such oxygen (21.8%), cleaning of sores (13.4%) and suction therapy (13.2%) which they could receive at home. Similarly, research showed that the greatest care needs of patients after discharge in the Islamic Republic of Iran were administration of a catheter and the care of wounds and dressings (27). A systematic review of home mechanical ventilation showed that such home care improved the quality of life of patients and reduced the number of hospitalizations (28). Even so, the rate of use of home mechanical ventilation varies considerable by country: 2.9 users of home mechanical ventilation/100 000 population

Table 5 Type of services provided for patients in hospital because of lack of homecare services

Service type	No. (%)
Oxygen	91 (21.8)
Cleaning sores	56 (13.4)
Suction	55 (13.2)
Tracheostomy care	51 (12.2)
Bedsore care	47 (11.3)
Nasogastric tube	44 (10.6)
Foley care	38 (9.1)
Dressing change	17 (4.1)
Physiotherapy	13 (3.1)
Immobility care	4 (1.0)
Double lumen catheter	1 (0.2)
Total	417 (100.0)

in Hong Kong, 3.9/100 000 in Hungary, 9.9/100 000 in Australia, 10.5/100 000 in Sweden, 1/100 000 in New Zealand and 12.9/100 000 in Canada (29–33).

The most important limitation of our study was its focus on patients with inappropriate hospital stay to estimate home health care demand at discharge. We did not include patients with appropriate stay who may also need home health care after discharge. Therefore the demand may be higher than our results suggest.

Institutionalizing home health care in the Iranian health system could improve the appropriate use of hospital beds, reduce health system costs, decrease readmission rates and prevent hospital complications such as falling out of bed and nosocomial infections (34,35). Covering home health care under the Iranian health insurance plan will encourage more home health care referral and reduce inappropriate hospitalization, especially for diabetes and neurological diseases. Registries of home health care centres that can provide care to patients referred by hospitals and family physicians would enhance a home health care system.

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Séjours hospitaliers inappropriés et association avec le manque de services de soins à domicile

Résumé

Contexte : Les efforts qui visent à réduire les séjours hospitaliers inappropriés, notamment des alternatives telles que les soins à domicile, sont importants pour améliorer les soins prodigués aux patients et réduire les coûts des soins de santé.

Objectifs : La présente étude a évalué les séjours hospitaliers inappropriés à Chiraz (République islamique d'Iran) pour examiner dans quelle mesure ces séjours étaient dus au manque des services des soins à domicile et à d'autres facteurs nécessaires à la mise en place de ces services.

Méthodes : La présente étude transversale a été menée entre janvier 2018 et septembre 2019 dans deux hôpitaux publics à Chiraz. Tous les patients adultes admis dans ces deux hôpitaux pendant la période d'étude ont été inclus, sauf les patients des services de soins psychiatriques. La pertinence des séjours hospitaliers des patients a été évaluée sur une base quotidienne à l'aide de la version iranienne de l'outil *Appropriate Evaluation Protocol* (Protocole d'évaluation de la pertinence). Le test du khi carré a été utilisé pour évaluer l'association entre les besoins en matière de soins à domicile et les caractéristiques du patient.

Résultats : Sur 6458 journées d'hospitalisation évaluées (pour 1954 patients), 710 journées (11,0 %) étaient inappropriées. La plus grande proportion des causes des séjours inappropriés était liée aux médecins (32,9 %). Sur 710 journées d'hospitalisation inappropriée, 231 étaient dues au manque de services de soins à domicile. La plupart des patients hospitalisés d'une façon inappropriée à cause de l'absence de services de soins à domicile bénéficiaient de l'assurance Salamat (64,0 %). Une relation statistiquement significative a été constatée entre le besoin en matière de soins à domicile et le type d'assurance-maladie ($p = 0,01$) ; 36,8 % des patients admis à l'hôpital en raison du manque des services de soins à domicile étaient atteints de maladies endocriniennes, notamment de diabète, et 21,8 % avaient besoin de services d'oxygène.

Conclusion : L'institutionnalisation des soins de santé à domicile dans le système de santé iranien pourrait encourager davantage l'orientation vers les soins à domicile et réduire les hospitalisations inappropriées, notamment pour les patients diabétiques.

الإقامة غير الملائمة في المستشفيات وعلاقتها بنقص خدمات الرعاية المنزلية

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الخلاصة

الخلفية: من المهم بذل جهود للحد من الإقامة غير المناسبة في المستشفيات، بما يشمل توفير بدائل مثل الرعاية المنزلية، لتحسين رعاية المرضى وخفض تكاليف الرعاية الصحية.

الأهداف: هدفت هذه الدراسة إلى تقييم الإقامة غير المناسبة في المستشفيات في مدينة شيراز، جمهورية إيران الإسلامية وإلى أي حد هذه الإقامة ناجمة عن نقص خدمات الرعاية المنزلية وغيرها من العوامل اللازمة للرعاية المنزلية.

طرق البحث: أجريت هذه الدراسة المقطعية في الفترة بين يناير/ كانون الثاني 2018 وسبتمبر/ أيلول 2019 في مستشفيين عامين بمدينة شيراز. وأدرج جميع المرضى البالغين الذين تم إدخالهم إلى هذين المستشفيين في فترة الدراسة، باستثناء المرضى في أجنحة الرعاية النفسية. كما قُيِّم مدى ملاءمة إقامة المرضى في المستشفيات بصفة يومية باستخدام النسخة الإيرانية من بروتوكول تقييم مدى الملاءمة. واستُخدم اختبار مربع كاي (χ^2) لتقييم العلاقة بين الحاجة إلى الرعاية المنزلية وخصائص المرضى.

النتائج: من بين 6458 يوماً لفترة الإدخال إلى المستشفى التي تم تقييمها (بما يشمل 1954 مريضاً)، اتسمت الإقامة بعدم الملاءمة في 710 أيام (11,0 %). وكانت النسبة الأكبر من أسباب الإقامة غير الملائمة متعلقة بالطبيب (32,9 %). ومن بين 710 أيام غير ملائمة للإقامة في المستشفى، كان 231 يوماً منها يعود إلى نقص خدمات الرعاية المنزلية. وكان معظم المرضى الذين أدخلوا إلى المستشفى بشكل غير ملائم بسبب نقص خدمات الرعاية المنزلية مؤمناً عليهم من خلال تأمين "سلامات" (64,0 %). ووجد أن هناك علاقة ذات دلالة إحصائية بين الحاجة إلى خدمات الرعاية المنزلية ونوع التأمين الصحي ($p=0.01$). ومن بين المرضى الذين أدخلوا إلى المستشفى بسبب نقص خدمات الرعاية المنزلية، كان 36,8 % يعانون من أمراض الغدد الصماء، لا سيما السكري، وكان 21,8 % يحتاجون إلى خدمات الأكسجين.

الاستنتاج: إن إضفاء الطابع المؤسسي على الرعاية الصحية المنزلية في النظام الصحي الإيراني يمكن أن يشجع المزيد من خدمات الإحالة إلى الرعاية الصحية المنزلية، ويحد من الإدخال غير الملائم إلى المستشفيات، لا سيما بالنسبة لمرضى السكري.

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Self-reported maternal handwashing knowledge and behaviours observed in a rural hospital in Pakistan

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Abstract

Background: Under-5 mortality remains high in developing nations despite decades of multilateral cooperation to reduce it. Diarrhoea contributes up to 15% of all mortality in this age group. Frequently reported barriers include poor hygiene, lack of sanitation facilities, and negligible public health education on the issue. Interventions such as Water, Sanitation, and Hygiene (WASH) could complement modern public health approaches with renewed vigour in wake of SARS-CoV-II (COVID-19).

Aims: We sought to assess maternal hand hygiene and ability to prepare oral rehydration solution at home.

Methods: In addition to the ability to prepare oral rehydration solution at home, this cross-sectional study, carried out at the Sughra Shafi Medical Complex, Narowal during 2017, compared knowledge, attitudes and behaviours of mothers of children with diarrhoea to those whose children did not have diarrhoea.

Results: 511 (48%) children < 5 years were diagnosed with diarrhoea irrespective of household location. Among 1065 accompanying mothers recruited for this study, only 130 (12%) were able to prepare ORS at home and 288 (27%) qualified as regular hand-washers according to the criteria. Just over half of the respondents consumed untreated water supplied via a nearby canal. Almost 80% of neighbourhoods lacked waste collection.

Conclusion: These findings informed management of frequent child diarrhoea cases presented at the hospital with locally relevant preventive knowledge. They are also expected to be useful in educating mothers on regular handwashing and the preparation of ORS as home-based interventions.

Keywords: childhood diarrhoea, WASH, ORS, hygiene, sanitation

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Introduction

Sustainable development in the World Health Organization (WHO) Region for the Eastern Mediterranean (EMR) has been held back by familiar shortcomings (1,2). A recent review of the Millennium Development Goals (MDGs) depicted the EMR as making patchy progress instead of applying coherent national planning to improve living standards across the board. It cited known limitations to sector-specific development practised during the 20th century as evident in several countries where the burden of childhood diarrhoea (< 5 years of age) has persisted despite decades of multilateral engagement for its eradication (3,4). Analyses of these missed opportunities identified 2 interrelated and well-known factors being ignored. First, the continuously poor state of local sanitation in relation to prevailing diarrhoea. Second, disseminating knowledge of this relationship as a policy. Under 5 (< 5) diarrhoea is now the second biggest killer, causing 15% of total mortality in this age group besides leaving survivors with an array of lifelong disabilities, including malnutrition, developmental disorders, and enteropathies (4–6). Many communities in sub-Saha-

ran Africa have leveraged the aforementioned factors to achieve nearly 66% reduction in diarrhoea-attributed child mortality (3,7). Within the EMR, “low-performing countries” face an uphill struggle (8,9). Tens of millions of children remain at risk of preventable infectious diseases originating from compromised sanitation and hygiene at all levels (10,11). Modern public health paradigms must not ignore, but build further upon, traditional development approaches such as Water, Sanitation and Hygiene (WASH), particularly where basic community services are degraded or nonexistent.

Like many countries in the Region, Pakistan has a long history of implementing the global agenda for diarrhoea control (12). Despite hosting the 3rd International Association for Maternal and Neonatal Health Congress in Lahore to interventions like Control of Diarrhoea Disease and exploring various local treatment options, the country nevertheless continues to experience high < 5 mortality owing to diarrhoeal diseases (13–15). Recently introduced community-driven care models have relied on building coalitions to get greater in-depth perspectives on household hygiene practices (8,16). In 2015, the Expert Review Group ranked Pakistan among

the countries unlikely to achieve MDGs 4 and 5 on the back of structural factors such as inadequate maternal and child care, haphazard development and population displacements (1,10,17). However, some countries in the Region, e.g. Oman and Lebanon, have already met the health benchmarks.

Against this backdrop, we carried out this study at the paediatric department of a philanthropic teaching hospital in the eastern rural district of Narowal (Punjab, Pakistan). We sought to assess maternal hand hygiene and the ability to prepare oral rehydration solution (ORS) at home; these are considered the most impactful prevention and timely management practices for < 5 diarrhoea (18,19). We also contextualized maternal knowledge and behaviours with sociodemographic details along with household status and neighbourhood sanitation.

Our findings were expected to inform institutional protocol for prevention of child diarrhoea with the local situation so that staff could better educate caregivers particularly in wake on ongoing SARS-CoV-II (COVID-19). In addition, the study was expected to generate interest in this topic for future researchers at the institution.

Methods

This cross-sectional study recruited all mothers that accompanied children < 5 years of age at the hospital during July–September 2017. To assess the association of diarrhoeal disease with location (rural or urban) and self-reported maternal ability to prepare ORS, 2 study groups were established: mothers of children with diarrhoeal illness and mothers of children with non-diarrhoeal illnesses. For clinical diagnosis of child diarrhoea, the WHO definition was adopted: “passage of 3 or more loose or liquid stools per day (or more frequent passage than is normal for the individual)” (20).

In the absence of any reliable data from which to establish a baseline, sample-size calculations and the feasibility plan were based on a pilot study involving 65 mothers at an urban teaching hospital (21,22), where 22% of children of regularly hand-washing mothers presented with diarrhoea compared with 30% of the children of non-hand-washers.

Using *OpenEpi*, we calculated a total sample size of 1008 at 95% confidence interval, power of 80, and odds ratio 1.5. An additional 5% were recruited to arrive at final sample of 1065. Pilot testing also refined the response structure so that the analytical strategy could better test maternal knowledge of ORS preparation as being protective against child diarrhoea (21,22). Consecutive sampling was conducted to collect data during each of the 3 daily shifts including weekends.

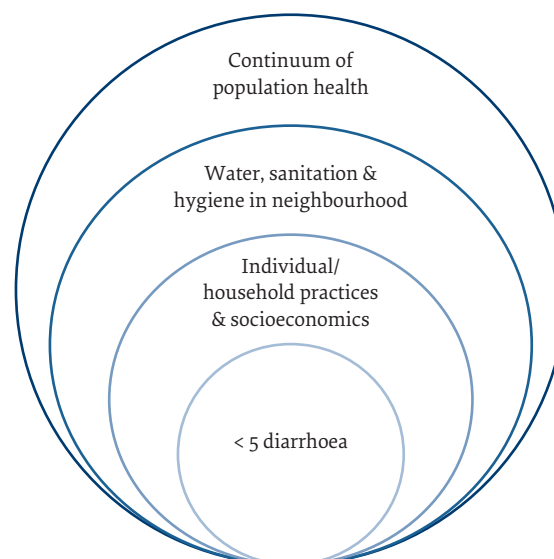
When a child initially presented to the paediatric department with a complaint (s)he was managed according to the established treatment protocol. Later, accompanying mothers were contacted for participation. The rationale of the study was explained to them before recruitment and they were asked to

sign an informed consent form printed in the local language. The mothers were then provided with a self-administered questionnaire in the local language. About 1090 accompanying mothers were invited to the survey out of which 1065 volunteered to participate (response rate 97.7%). Those who could not read and write were given details of the study orally by the investigator in the presence of family members. Informed consent was obtained as a thumb impression on the consent form. They were then interviewed by investigators in the local language to complete the questionnaire. Mothers in distress owing to their sick child and those declining to participate were excluded. All participating mothers were informed that their personal information would be confidential and kept for the period of 5 years. Afterwards, data in all forms would be shredded.

Maternal handwashing frequency was one of the key constructs of this study. Regular handwashing was defined in this study as performed with soap a minimum of 14 times a day after “critical moments” (23,24). These were reported as daily cultural routines comprising women cooking 3 meals and subsequently eating with household members, cleaning up and changing baby diapers, and responding to calls of nature.

The study tool was pre-tested for content validity and reliability. It was drafted in the local language according to the conceptual framework (Figure 1). The initial draft was shared with 2 national experts for comments on validity. Their feedback was incorporated to further categorize response options to match the analytical strategy. Once approved by the reviewers, the final questionnaire comprised 33 response options divided into 5 sections: demographic details; maternal knowledge and behaviours; state of neighbourhood sanitation; household water supply and usage; and access to local lady health workers (LHWs). It was then pilot-tested for

Figure 1 Conceptual framework to observe contextualized prevalence of diarrhoea in children under 5 years in a rural hospital in Pakistan



reliability in another hospital. The decision on its use in the study setting was made on computing the alpha coefficient ~ 0.77 . The final draft was adopted following 94% inter-examiner reliability.

All entries were done by a trained data entry intern under the supervision of the primary investigator. *Stata*, version 14, was used for analyses. Inferential statistics were computed to test the hypotheses for the 2 study groups while descriptive statistics were presented for the entire study sample for highlighting key findings with clarity. The ethical review committee at the constituent medical college approved this study.

Results

Demographic characteristics and the sanitation status of our sample are shown in Table 1. About one third of responding mothers had completed secondary school education. The most frequent source of household water supply was a nearby canal (59.1%). Although 93.7% of respondents reported cleaning their household water storage tanks at least once a year, less than half (44.5%) treated water before drinking and/or cooking.

Table 1 Demographic profile and sanitation status for children < 5 years ($n = 1065$) presenting at paediatric emergency in a rural hospital in Pakistan, 2017

Characteristic	No.	%
Age of child		
Neonate	44	4.1
Infant	601	56.4
2–5 years	420	39.4
Maternal education		
Never attended	104	9.8
Incomplete secondary school	324	30.4
Completed secondary school	352	33.1
College degree	236	22.2
University degree	49	4.6
Residence*		
Urban	201	19.0
Rural	855	80.3
Annual cleaning of household storage tank		
Yes	998	93.7
No	67	6.3
Source of household water supply		
Tube well	9	0.9
Personal boring	382	35.9
Nearby canal	629	59.1
Don't know	45	4.2
Drinking water treated		
Yes	474	44.5
No	591	55.5

*Some data missing.

Table 2 Frequency of conditions reported among children < 5 years ($n = 1065$) to paediatric emergency at a rural hospital in Pakistan, 2017

Condition	No.	%
Diarrhoea	511	48.0
Anaemia (weakness)	202	19.0
Acute respiratory infections	170	16.0
Skin lesions and trauma	105	9.9
Miscellaneous	77	7.3

Of the 1065 children < 5 years old presenting at the paediatric department with their mothers, a total of 511 (48.0%) were diagnosed with diarrhoea (Table 2) according to the WHO definition. After diarrhoea, anaemia or weakness was the second most common presenting complaint (202, 19.0%), confirmed by complete blood count.

Despite the majority of mothers knowing the local LHW personally (data not shown), only 130 (12.2%) were able to prepare ORS at home (Table 3); among these, 69.2% stated the local LHW was their main information source. The majority of the children (80.3%) were from rural areas (verified from hospital records) (Table 1) but the incidence of diarrhoea was independent of residence ($P > 0.05$). The median household income of our sample was rupees 20 000 (US\$ 208) (statistics not included). Almost 70% of respondents spent up to 2% of monthly household income on handwashing soap but only 64% stated they were willing to pay up to 2% (Table 4). However, 33.6% were willing to pay up to 5% of monthly household income on soap compared to 28.6% who reported actually spending this amount.

Almost 95% of respondents had access to at least one household toilet with running water (Table 5) but only 20.9% lived in neighbourhoods with a waste collection system. In accordance with our definition, 27.1% of mothers self-reported as regular hand-washers. Specifically, 17.6% reported washing hands with soap following each daily toilet visit and before cooking and eating.

Discussion

In this study we compared mothers of children < 5 years with diarrhoea to those whose children did not have diarrhoea and found little difference in hand hygiene knowledge, attitudes and practices in relation to sociodemographic details, the status of the household and neighbourhood sanitation.

Childhood diarrhoea was the most frequent condition among children presenting at the study hospital throughout the 3 months of data collection. Extremely low maternal knowledge of ORS preparation (12%) and the predominance of rural representation (81%) in our sample made it unlikely to meaningfully relate these 2 factors with the occurrence of childhood diarrhoea. The study hypotheses could have been better framed if

Table 3 Source of information of for knowledge of preparation of oral rehydration solution reported by mothers of sick children (n = 130) in a rural hospital in Pakistan, 2017

Information source	Mothers of children with non-diarrhoeal illness (n = 63)		Mothers of children with diarrhoeal illness (n = 67)	
	No.	%	No.	%
Knows by profession	2	3.1	3	4.4
TV/radio	12	19.0	18	26.8
Hospital staff	2	3.1	3	4.4
Health worker	47	74.6	43	64.1

a prior baseline for these variables had been available. Nevertheless, our findings might serve as baseline for future research on this topic. In fact, our results identified important thematic areas in health service delivery for researchers since the majority of respondents knew their local LHW personally but were unable to prepare ORS at home. Despite this reported disconnect, LHWs were the most frequent source of information on ORS preparation among those who knew how to do it. Only 5 respondents mentioned hospital staff (physicians, nurses) as their informers on ORS preparation. These findings met the study objective to assess the need for an updated protocol at this hospital to contextualize preventive management of child diarrhoea with household practices and the state of sanitation in the neighbourhood. Follow-up studies are strongly recommended in this hospital to observe the intended impact of educating caregivers/ mothers in relation to future caseloads of < 5 diarrhoea. Institutionalized information on household and neighbourhood factors could partly offset chronic gaps in rural health for non-diarrhoeal illnesses too (17,25).

We identified the frequency of non-diarrhoeal conditions that could be further studied for corresponding strategies. With the very low overall knowledge of ORS preparation reported above, our results showed both radio and television as being the most common source of information on ORS preparation (statistics not included), second only to hospital staff. These findings could

encourage greater use of broadcast media to improve health literacy in similar settings (26,27).

Health and hygiene behaviours represent an emerging frontier of public health that was touched upon here (1,28). Irrespective of nearly all respondents having access to a household toilet equipped with a flush system, less than 50% reported washing hands regularly after toilet visits and only 18% reported maintaining hand hygiene for all of the 3 daily activities. This warrants better understanding of complex behavioural pathways mentioned in the Global Enteric Multicentre Study that aimed to devise policy levers to cut the spread of diarrhoeal illness through curbing oral–faecal transmission (28). In some south Asian countries (Bangladesh, India, Pakistan), it was reported that over 93% households had toilets yet in a significant proportion, human faeces were visible within the house or adjoining yard (28). A study from the hilly region of Swat in Pakistan also reported substantial faecal contamination of drinking water sources (29). Oral–faecal transmission contributes widely to nearly 2 billion annual diarrhoeal episodes in children < 5 worldwide.

In our sample, about one-third of the mothers stated they were willing to pay up to 5% of monthly household income on soap and 28.6% reported actually doing so. Future research should assess the affordability of soap in low-resource, but water-sufficient, communities and the role of income as barrier or facilitator of handwashing. It is important to highlight the relationship between household income and handwashing so that this can be promoted in such communities. Our findings have suggested that a smaller household income is related to a lower willingness to pay for soap.

As is commonplace in global epidemiological data, developing nations carry a disproportionate burden of diarrhoea and its aftermath with chronic institutional incapacities (24,30). It has been feared that continued lack of investment in public services coupled with higher population growth rates could reverse the health gains of past decades in developing countries. These projections warrant a comprehensive response to control oral–faecal spread through improving the quality of existing research into health behaviours. With the abundant data on development history now available for many countries and regions, traditional approaches such as WASH could

Table 4 Comparison of monthly household income spent on soap and willingness to pay for it (reported by mothers of children under 5 years presenting to a rural paediatric department in Pakistan), 2017

Willingness to pay for soap as percentage of monthly household income (%)	Monthly household income spent on paying for handwashing soap No. (%)					Total
	≤ 1%	≤ 2%	≤ 5%	≤ 10%	10%	
≤ 1	263 (25.2)	12 (1.1)	0	0	0	275 (26.4)
> 1 to 2	49 (4.7)	328 (31.5)	14 (1.3)	1 (0.09)	0	392 (37.6)
> 2 to 5	0	64 (6.1)	279 (26.8)	6 (0.5)	1 (0.09)	350 (33.6)
> 5 to 10	0	1 (0.09)	3 (0.2)	13 (1.2)	1 (0.09)	18 (1.7)
> 10	1 (0.09)	2 (0.1)	2 (0.1)	0	0	05 (0.4)
Total	313 (30)	407 (39.1)	298 (28.6)	20 (1.9)	2 (0.1)	1040

Table 5 Daily frequency of handwashing with soap and sanitation status among mothers (n = 1065) of children presenting to a rural hospital in Pakistan, 2017

Factor	No.	%
Maternal handwashing practice		
After toilet use	488	45.8
Toilet use & before meals	384	36.1
After toilet, before meals, before cooking	187	17.6
Infrequent or minimal	06	0.6
Household toilet with water tank & flush		
Yes	1005	94.4
No	60	5.6
Frequency of self-reported handwashing with soap		
≤ 6 times daily	125	11.7
< 14 times daily	651	61.1
≤ 14 times daily	289	27.1
Neighbourhood waste collection system present		
Yes	220	20.9
No	830	78.5
Don't know	09	0.9

find innovative implementation methods for greater community impact (3,31).

Our sample was limited by time and catchment area served by a solitary teaching hospital; thus we excluded analysis of water, hygiene and sanitation in relation to the prevalence of < 5 diarrhoea according to income group. This may have informed a useful social determinants perspective. Analytical study designs could provide these

missing details since low levels of neighbourhood waste collection and widespread consumption of untreated canal water are often linked to < 5 diarrhoea (3,32). For such undertakings, far more resources and experience in the development sector would have been required such as reflected in large household surveys carried out by international organizations (33). Rates of child diarrhoea reported here could also be inflated due to the concurring monsoon, which creates conditions favourable for the transmission and spread of infections. At facility level, year-round disease registries are suggested as a local surveillance tool. In addition, periodic assessments of staff knowledge and attitudes on prevailing diseases could identify professional training needs for better case management (34,35). Finally, the minimal inter-group differences observed in this study necessitated the presentation of statistics for the entire sample to avoid meaningless comparisons and vague interpretations.

Conclusion

Child diarrhoea was the major reason for hospital admission irrespective of rural or urban residence. Despite residing in neighbourhoods that lacked solid waste collection, few mothers practiced regular hand hygiene. Similarly, maternal knowledge on preparing ORS was very limited despite familiarity with local LHWs. Untreated canal water was widely consumed in households. This information could be useful not only in better treatment for child diarrhoea but also to enable hospital staff to contextualize WASH as a tool for education on prevention for caregivers. Simultaneous studies on impact must be undertaken.

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Connaissances autodéclarées des mères en matière de lavage des mains et comportements observés dans un hôpital rural au Pakistan

Résumé

Contexte : La mortalité des moins de 5 ans reste élevée dans les pays en développement malgré les efforts de coopération multilatérale déployés depuis plusieurs décennies pour la réduire. Jusqu'à 15 % de la mortalité totale dans cette tranche d'âge est liée à la diarrhée. Les obstacles fréquemment signalés comprennent les mauvaises conditions d'hygiène, le manque d'installations d'assainissement et l'insuffisance des efforts de sensibilisation sur la question. Des interventions dans le domaine de l'eau, de l'assainissement et de l'hygiène (WASH) pourraient venir compléter les approches modernes de santé publique avec une vigueur renouvelée afin de lutter contre le SARS-COV-2 (COVID-19).

Objectifs : Nous avons cherché à évaluer l'hygiène des mains des mères et leur capacité à préparer une solution de réhydratation orale (SRO) à domicile.

Méthodes : Outre cette capacité, la présente étude transversale, qui a été réalisée en 2017 au complexe médical Sughra Shafi, à Narowal, et se proposait de comparer les connaissances, les attitudes et les comportements des mères d'enfants souffrant de diarrhée à celles dont les enfants n'en souffraient pas.

Résultats : Sur les enfants de moins de 5 ans, 511 (48 %) souffraient de diarrhée, quel que soit le lieu du foyer. Des 1 065 mères accompagnantes recrutées pour la présente étude, seules 130 (12 %) ont été en mesure de préparer une SRO à domicile et 288 (27 %) ont satisfait aux critères leur permettant d'être reconnues comme pratiquant un lavage de mains régulier. Un peu plus de la moitié des répondantes consommaient l'eau non traitée d'un canal situé à proximité. Il n'y avait pas de collecte de déchets dans près de 80 % des quartiers.

Conclusion : Ces résultats seront utiles à la prévention au niveau local et permettront d'améliorer la prise en charge des cas fréquents de diarrhée infantile observés dans cet hôpital. On s'attend également à ce qu'ils soient utiles pour éduquer les mères au lavage régulier des mains et à la préparation des SRO à domicile.

معلومات وسلوكيات الأمهات المبلّغ عنها ذاتياً بشأن غسل اليدين التي شوهدت في مستشفى ريفي في باكستان

شهنور أزهر، مديحة فيصل، عريفة أمان

الخلاصة

الخلفية: لا يزال معدل وفيات الأطفال دون سن الخامسة مرتفعاً في البلدان النامية على الرغم من مرور عقود من التعاون المتعدد الأطراف سعيًا لخفضه. ويساهم الإسهال بنسبة تصل إلى 15٪ من إجمالي الوفيات في هذه الفئة العمرية. ومن بين العقبات المبلغ عنها في كثير من الأحيان سوء النظافة الصحية، والافتقار إلى مرافق الإصحاح، وتجاهل التثقيف الصحي العام بشأن هذه المسألة. ويمكن لبعض التدخلات مثل المياه والإصحاح والنظافة أن تتمم نهج الصحة العامة الحديثة من أجل تحقيق تأثير أكبر.

الأهداف: هدفت هذه الدراسة إلى تقييم نظافة اليدين لدى الأمهات وقدرتهن على تحضير محلول الإمهاء الفموي في المنزل.

طرق البحث: بالإضافة إلى القدرة على تحضير محاليل الإمهاء الفموي في المنزل، قارنت هذه الدراسة المقطعية، التي أجريت في مجمع «صخرة شافي» الطبي في ناروال خلال عام 2017، بين معلومات واتجاهات وسلوكيات أمهات الأطفال المصابين بالإسهال وأمهات الأطفال غير المصابين بالإسهال.

النتائج: شُخصت إصابة 511 طفلاً (48٪) ممن تقل أعمارهم عن 5 سنوات بالإسهال بغض النظر عن موقع الأسرة. ومن بين 1065 أمًا مرافقة اختبرت للمشاركة في هذه الدراسة، لم تتمكن سوى 130 أمًا (12٪) من تحضير محاليل الإمهاء الفموي في المنزل، وتأهلت 288 أمًا (27٪) لمعايير غسل اليدين بانتظام. وكان أكثر من نصف المستجيبات يستهلكن المياه غير المعالجة الواردة من قناة قريبة. ويفتقر ما يقرب من 80٪ من الأحياء السكنية إلى جمع النفايات.

الاستنتاج: وفّرت هذه النتائج المعلومات الوقائية الملزمة للسياق المحلي التي أسهمت في توجيه علاج الأطفال المصابين بالإسهال المتكرر الذين يحضرون إلى المستشفى. ومن المتوقع أيضاً أن تفيد في تثقيف الأمهات بشأن غسل اليدين بانتظام وتحضير محاليل الإمهاء الفموي باعتبارهما تدخلات منزلية.

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Leveraging technology and supply chain to improve family planning logistics in Pakistan

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Abstract

Background: Pakistan and USAID have invested in improving the contraceptive supply chain data and commodity security. In 2011, the first digital contraceptive logistics management information system (cLMIS) was launched, enabling supply chain data visibility from the federal level to health facilities. The system has built-in modules on forecasting and supply planning, inventory management, consumption reporting, business intelligence tools, automatic email and SMS alerts. Using these features, policy-makers and health managers annually forecast needs, and procure contraceptives accordingly.

Aims: The objective of this research was to understand the existing technological platforms for family planning (FP) supply chain data visibility and the potential impact on contraceptive commodity security.

Methods: The authors reviewed available published and grey literature papers on contraceptives and supplies in Pakistan. We extracted data from the cLMIS, evaluated indicators including reporting compliance, reported stock-out rates, and contraceptive performance. The analysis was validated by reviewing supply chain and FP indicators, such as average monthly consumption, months of stock, and couple years of protection.

Results: The cLMIS has resulted in improved distribution, early warning and accountability at the lowest tiers in the FP supply chain in the public sector. At the facility level, FP commodity availability increased from 40% in 2009 to 84% in 2018.

Conclusion: Contraceptive supply chain has seen significant growth over the past decade to meet expanding reproductive health evidence to inform strategic decisions; cLMIS is a prime contributor to improvements registered in FP stock availability at public sector facilities.

Keywords: logistics management information system, family planning commodities, data visibility, stock availability

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Introduction

Through enabling people to determine the number and spacing of their children, contraception offers a range of potential benefits, including contributing to economic development, improved maternal and child health, and being a source of women's empowerment (1).

Despite increases in contraceptive use, an estimated 214 million women of reproductive age had an unmet need for contraception in low- and middle-income countries in 2017 (2). Reducing unmet need for modern contraception by increasing the access to and supply of contraceptives has been a critical area of interest in reproductive health for decades (2). It is key to meeting the family planning (FP) 2020 goal of enabling an additional 120 million women and girls in the world's poorest countries to be using modern methods of family planning by 2020 (3). Thus, the objective of this research was to understand the existing technological platforms for FP supply chain data visibility and the potential impact on contraceptive commodity security.

Although there has been a national FP programme since the 1960s, there has been limited progress in

Pakistan. The country faces rapid population growth, with projections that by 2050 the population will surpass 310 million from 207.7 million currently (4). A signatory to the global FP2020 pledge (5), Pakistan is committed to reducing its population growth rate by increasing the contraceptive prevalence rate from 34.2% in 2017–18 to 50% by 2020; however, modern contraceptive use by married women has remained stagnant over the past 5 years, with 26% of women using a modern method in 2012–13 (6) and 25% in 2017–18 (7). Among the modern method mix, there was negligible difference in the use of all methods over time.

Even with substantial efforts, Pakistan's health and population departments struggle to steward dynamic FP programmes. The primary hindrance in successfully implementing FP programmes remains a lack of coordination among government run health and population welfare departments, planning and finance divisions, and public and private stakeholders (8).

In 2010, provincial departments of population welfare were moved to the administrative control of the provinces and became administratively independent from the Ministry of Population and Welfare. This administrative

change did not create significant improvement in health systems (9); even with support from donors and nongovernmental organizations, supply chain systems remained ad hoc and fragile. A 2014 qualitative study showed frequent stock-outs and interrupted supplies decreasing access to FP (6). Requisitioning contraceptives from different departments/stakeholders, poor supply mechanisms, lack of transportation financing, inadequate planning, procurement delays and the lack of a monitoring and supervision framework compounded the challenges (6). Before 2011, the system was inadequate owing to the lack of a standardized logistics management information system (LMIS) for FP products (10).

Lack of access and lack of availability caused by supply chain failures are among the principal reasons for contraceptive non-use and contraceptive discontinuation (11). Supply chain management comprises the steps involved in moving a product from the supplier to the customer (12). Research has identified distribution system inefficiencies and lack of institutionalized LMISs as critical barriers to effective contraception supply chains in low- and middle-income countries (13). For example, Morocco's highly complex "pull-based" supply chain system involved excessive steps and relied on the accuracy of 900 minimally-trained midwives at service delivery points to make contraception forecasts (14). The system required facilities to pick up supplies from the warehouse at their own expense, and many facilities kept poor inventory records. In Senegal, Daff et al. contend that inefficiencies in the public health supply chain system contributed to a lack of accurate and timely data hindering the existence of a well-functioning supply chain system (15). These examples illustrate that the absence of robust public health supply chains systems leads to unreliable data and inaccurate forecasts and procurements, which can impact the product availability at the last mile.

Prior to the implementation of the contraceptive logistics management information system (cLMIS) in Pakistan, the reported clients, via service delivery point data and observed by surveys, showed major differences. The contraceptive performance reports published by the Pakistan Bureau of Statistics depended on the collation of the manual records available in the warehouse, and even then showed some inconsistencies (Tables 1,2).

Recognizing these issues, the Government of Pakistan looked at options available to resolve the discrepancies and streamline the system. In Pakistan, prior to 2008, contraceptives were supplied via the Central Warehouse's manual record keeping system, leading to errors and delays. In response to a request from the health ministry in 2008, this manual record keeping system was replaced by an online system, the cLMIS. It was developed as a result of cooperation between the Ministry of National Health Services, Regulations and Coordination, the provincial departments of health and the population welfare departments with support from the United States Agency for International Development (USAID) (16).

In July 2011, during the first phase of implementation, 19 districts (out of 143 total) across Pakistan were equipped with the system. Staff were trained, and pilot testing carried out to verify that the new system would improve data visibility, enabling effective stock monitoring. By 2012, it had been scaled up nationally and was used in all 143 districts. With USAID support, around 1000 government staff in provincial health and population welfare departments received training on how to use the cLMIS (17).

This cLMIS collects, organizes and reports data, and generates analytics to facilitate improved policy decisions. The system enables supply chain data visibility of all contraceptive health commodities for the public sector and nongovernmental organizations. With the introduction of the web-based cLMIS, managers, logisticians and donors have better visibility into the supply chain and can thus improve their management to ensure products reach consumers through Pakistan's health care delivery system. The cLMIS allows authorized users at various locations to enter logistical data and access cLMIS reports through a web browser. Reports include stock status, months of stock and other information critical to supply chain functioning. By improving the timeliness and quality of logistics data and reducing the time needed to access the data, the cLMIS effectively enables evidence-informed decision-making for supply chain management (17).

Table 1 Trends in commodity/service supply, Pakistan, 2011–2018 (million persons served)

Type	Year							Difference 2011–2018 (%)
	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	
Condoms	1.49	1.88	1.93	2.58	2.73	2.74	2.71	1.22 (44.9)
Oral pills	0.48	0.50	0.52	1.15	1.15	1.47	1.30	0.82 (63.1)
Intra-uterine device (insertions)	1.32	1.23	1.67	1.79	1.82	1.89	1.83	0.51(28.1)
Injectable (vials)	0.54	0.58	0.56	1.46	1.31	1.85	1.63	1.09 (66.9)
Contraceptive surgery (sterilization)	0.12	0.10	0.11	0.22	0.19	0.17	0.17	0.05 (31.2)
Total	3.95	4.29	4.80	7.20	7.19	8.12	7.64	3.69 (48.3)

Source: Pakistan Bureau of Statistics. Annual contraceptive performance reports from the years 2011–12 to 2017–18.

Table 2 Service delivery vs uptake for 2011–18 (million persons served)

Type	Service delivered ^a	Service uptake ^b	Difference
Condoms	2.71	9.20	-6.49
Oral pills	1.30	1.70	-0.40
Intra-uterine device (insertions)	1.83	2.10	-0.27
Injectable (vials)	1.63	2.50	-0.87
Contraceptive surgery (sterilization)	0.17	8.90	-8.73
Total	7.64	24.40	-16.76

^aFrom the Contraceptive Performance Report 2017–18.

^bFrom the Pakistan Demographic and Health Survey 2017–18 (sterilization includes 8.8 for women and 0.1 for men).

Methods

The authors reviewed papers on contraceptive use and logistics, both published and grey literature, relating to Pakistan as well as the contraceptives performance reports compiled by the Pakistan Bureau of Statistics and the Pakistan Demographic and Health Surveys (6,8,18). In addition, data was extracted from the cLMIS, focusing on such indicators as reporting rate and stock availability ratios. The data extracted from cLMIS included indicators on data reporting compliance, reported stock-out trends and contraceptive performance (Figure 1).

Stock availability and reporting rates from 2015–2018 were compared. The study was conducted considering one stakeholder, the population welfare departments, in all 4 provinces. The population welfare department is the main stakeholder in contraceptive service delivery for the public sector and the not-for-profit private sector.

Results

Systems reporting compliance improved over the years, showing increased contraceptive performance and improved stock availability at the service delivery points. Quantitative data obtained from cLMIS were used for time series analysis of reporting rates as well as data use

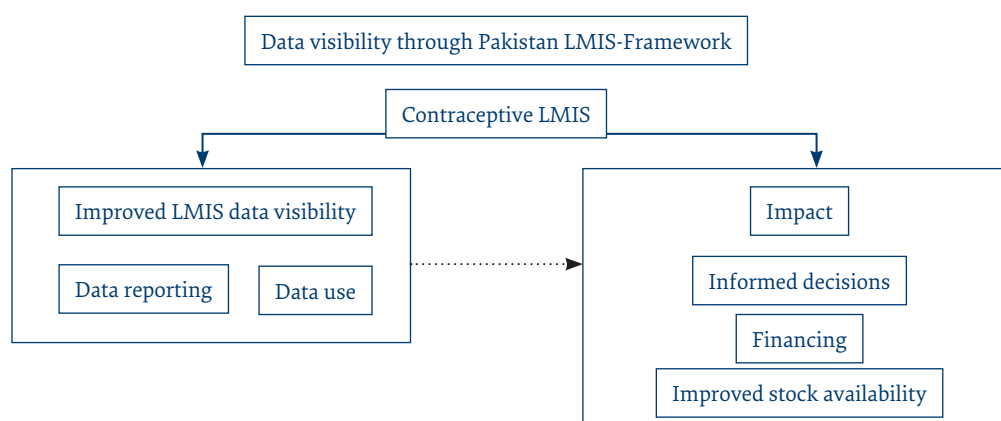
and stock availability. Stock availability and reporting rates over 4 years (2015–2018) were compared (Figure 2). The graph shows the stock availability of 4 products, condoms, pills, intrauterine contraceptive devices and injectables, for 2015–2018. The data usage indicator was developed to ascertain that supply decisions were in line with stock availability at service delivery points. The reporting rate and data use increased from 71% to 99% and stock availability increased from 86% to 91%. The analysis confirms that, with improved data visibility through the LMIS, decision-makers were able to take decisions on allocation of funds for contraceptive procurement, leading to improved stock availability. The availability of supplies in the public sector has led to an increase in the share of services provided for condoms, intrauterine contraceptive devices and injectables.

Discussion

The main purpose of an improved supply chain is to ensure commodity availability (19). The cLMIS reduced paper-based reporting and optimized health systems data reconciliation at the health facility level. Timely reporting at the district and union council level (lowest administrative tier of the government) is essential to ensuring superior stock monitoring from procurement to “last-mile”.

Web-based end-to-end dashboards made the cLMIS data for the entire supply chain visible to government decision-makers, including but not limited to the health secretariat and federal and provincial health ministries. These powerful analytics inform the relevant authorities to take timely actions for stock replenishments at district and health facility levels. One key example would be the FP executive dashboard, which informs the decision-makers at the provincial and district levels where service delivery point stocks have gone below the agreed-upon levels, posing a risk of stock-out. The system also automatically generates stockout emails and SMS alerts, enabling relevant officials to take timely decisions.

The FP executive dashboard was developed to provide an overview of stock sufficiency for FP commodities in

Figure 1 The framework demonstrating the Pakistan contraceptive logistics management information system (LMIS)-driven data visibility

all 4 provinces, relevant districts and service delivery points/health facilities. In each province, the health and population welfare departments are the main consumers of FP commodities, and in some provinces, such as Sindh, both departments are procuring jointly with storage at the Central Warehouse and Supplies in Karachi. Thus, the dashboard not only provides a real-time stock situation at the Central Warehouse & Supplies but also the pipeline for each product, enabling users to observe the stock situation for a particular commodity at the service delivery point level (20).

It is worth noting that data reporting in the districts and health facilities is compiled on a monthly basis. Consequently, the stock data for districts and health facilities will be displayed in the upcoming month, i.e. data related to March will be displayed in April after data entry has been completed. By requiring that data for a given month be reported before the 10th of the upcoming month, data visibility is greatly improved. This monthly reporting also accurately calculates reordering dates such that stock sufficiency levels are maintained, minimizing the possibility of future stock-outs.

The stock-out rate is defined as the number of service delivery points that, at any point, in a defined period (e.g. the past 3, 6 or 12 months), experience a stock-out of a specific FP tracer product that the service delivery point is expected to provide. The web-based end-to-end dashboards display the months of stock for each product using different colours to identify the level of severity with respect to replenishing the stock. This provides users with intelligence for when and how much a particular product needs to be ordered in the future to maintain the desired maximum stock levels.

Increased data visibility through cLMIS enabled policy-makers and managers to take evidence-informed and timely decisions, particularly in terms of replenishing stock. This was supported by the system's ability to generate automatic email and SMS alerts to policy-makers and managers. For example, based on district consumption trends generated from LMIS data, all 4 provinces (Balochistan, Khyber Pakhtunkhwa, Punjab,

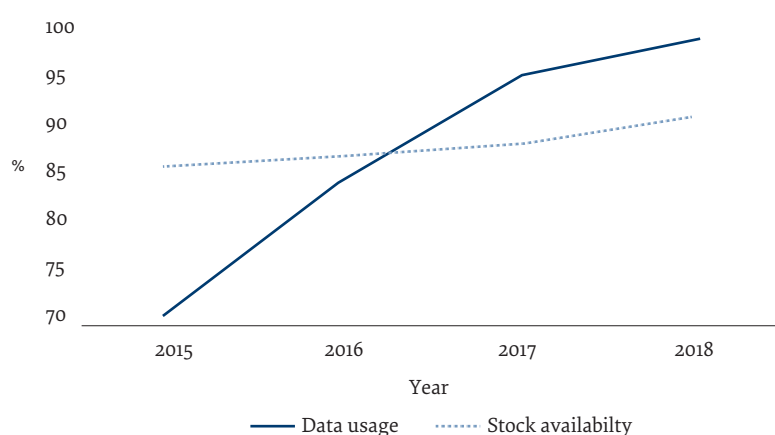
Sindh) and other regional governments committed more than \$US 130 million during 2014–2020 for FP commodity procurement, with an average of \$US 20 million per year compared with \$US 5 million per year before (2001–2009) (32). Technology improved the data visibility for cLMIS helping policy-makers make timely and better decisions.

Nationally speaking, there are a total of 20 503 active service delivery points in Pakistan; 5030 fall under the purview of the population welfare department, 12 940 under the provincial departments of health, and 2533 under the People's Primary Healthcare Initiative. Based on cLMIS data and improved reporting compliance, the contraceptive method mix shifted towards long-term methods, including intrauterine devices and implants. The national consumption of intrauterine contraceptive devices increased from 0.96 m in 2015 to 1.05 m in 2018, and implants from 0.033 m in 2015 to 0.075 m in 2018 (www.lmis.gov.pk). The stock-out trend analysis showed that the increase in supply data was accompanied by an increase in stock availability, i.e. an increase of stocks present at the service delivery point.

The trend escalated further after automatic stock alerts were generated to managers/policy-makers through email and SMS, which was first introduced in 2018. The stock availability rate reported in 2018 was 91% (Figure 2). This was mainly due to resource mobilization by the provincial governments for contraceptive procurement along with timely initiation of procurements contingent upon LMIS based quantification. Around 5000 alerts generated in 2018–19 enabled policy-makers to take timely actions to avert stock-outs; however, the use of data and alerts is an incremental journey (23).

The paper-based reporting system was automated, leading to better maintained and more accurate records and the removal of duplication of efforts. Political ownership and support by senior leadership for cLMIS helped to achieve timely data reporting and ensure data quality, leading to effective decision-making (24). The provincial authorities issued notifications to the districts for reporting compliance, which enabled timely visibility of data (25).

Figure 2 Comparison of data use and stock availability for condoms, pills, intrauterine contraceptive devices and injectables in Pakistan, 2015–2018



The stock-out rate decreased from 14% to 9% (Figure 2) due to improved access to accurate, timely and reliable inventory information. Data were used to support improved forecasting, which was formerly based on manually compiled consumption data, usually one-year-old data. Accurately estimating forecasted need is key to ensuring that the correct quantities of contraceptives are procured to provide a regular, uninterrupted supply of commodities (26). This in turn supported clear costing of the FP commodity needs. These demand and financing requirements were calculated based on data obtained from cLMIS that led to better financial management and timely procurement of FP commodities. The LMIS reporting enabled measurement of the modern contraceptive prevalence rate based on a couple of years' protection generated, which was impossible previously (22).

Despite improving the reporting rates and stock availability, Pakistan's cLMIS, as is the case in many other low- and middle-income countries, still faces challenges, including a lack of integration. The cLMIS needs to be linked with the district health information system or the national health management information system (6); integration would enable better coordination and delivery of services and supplies of FP (27).

Another challenge is sustainability. There is still no health information and communication policy which could serve as a guideline for digitizing the health sector, avoiding duplication of efforts and leveraging technology for evidence-informed decision-making (28). There also remains a lack of trained human resources (29). Management issues like calibrating stock (to avoid stock-outs or overstocking) as well as lack of communication and interdepartmental coordination also complicate efforts (19,30). Other issues include inconsistencies in

reporting meaning the system is unable to identify exact demand (6). Finally, there are challenges around financing for delivering FP products from the district warehouses to the health facilities. Strengthening supply chains to meet the growing demand for FP will require systems diagnostics, supply chain redesign or adjustment, strategically located storage and distribution systems, adequate staffing and training, and better information about inventory and financing (31). To help address these challenges, there is a need to bring all stakeholders together to have and use a single platform for an integrated health information system where services, surveillance, demographic and logistic data streams intersect in addition to health information and communication policy.

Conclusion

With USAID support, the Pakistan FP supply chain has expanded over the past decade from \$5m to around \$20m spending per year (21). This growth has been accelerated by providing decision-makers with the evidence needed to make timely strategic decisions. However, the system is still experiencing challenges such as frequent stock-outs and a lack of contraceptives, which has a negative impact on programme effectiveness and quality of care, resulting in a loss of trust in the overall health system (32). Technology-driven data visibility alone is insufficient; for real change to happen, data must be analysed and used for routine and strategic decisions and for continuous quality improvement. Against this backdrop, cLMIS indisputably stands out by improving FP stock availability at the last mile.

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Mettre à profit la technologie et la chaîne d'approvisionnement pour améliorer la logistique de la planification familiale au Pakistan

Résumé

Contexte : Le Pakistan et l'USAID ont investi dans l'amélioration des données de la chaîne d'approvisionnement en contraceptifs et de la sécurité des produits. En 2011, le premier système numérique d'information pour la gestion de la logistique des contraceptifs a été lancé, permettant la visibilité des données de la chaîne d'approvisionnement depuis le niveau fédéral jusqu'aux établissements de santé. Le système comprend des modules intégrés de prévision et de planification de l'approvisionnement, de gestion des stocks, de rapports de consommation, d'outils de veille stratégique, d'alertes automatiques par courriel et par SMS. En utilisant ces options, les responsables de l'élaboration des politiques et les responsables de la santé peuvent prévoir les besoins chaque année et en conséquence se procurer des contraceptifs.

Objectifs : L'objectif de la présente recherche était de comprendre les plateformes technologiques existantes pour la visibilité des données de la chaîne d'approvisionnement pour la planification familiale et l'impact potentiel sur la sécurité des produits contraceptifs.

Méthodes : Nous avons passé en revue les articles disponibles publiés et la littérature grise sur les contraceptifs et les fournitures au Pakistan. Nous avons extrait les données du système numérique d'information pour la gestion de la logistique des contraceptifs, évalué les indicateurs, notamment la conformité des rapports, les taux de rupture de stock rapportés et la performance des contraceptifs. L'analyse a été validée par l'examen de la chaîne d'approvisionnement et des indicateurs de planification familiale, tels que la consommation mensuelle moyenne, les mois de stock et le couple-années de protection.

Résultats : Le système numérique d'information pour la gestion de la logistique contraceptive a amélioré la distribution, l'alerte précoce et la responsabilisation aux niveaux les plus bas de la chaîne d'approvisionnement en planification familiale dans le secteur public. Au niveau des établissements, la disponibilité des produits de planification familiale est passée de 40 % en 2009 à 84 % en 2018.

Conclusion : La chaîne d'approvisionnement en contraceptifs a connu une croissance significative au cours de la dernière décennie pour répondre à l'augmentation des bases factuelles en matière de santé reproductive afin d'informer les décisions stratégiques. Le système numérique d'information pour la gestion de la logistique des contraceptifs joue un rôle important dans les améliorations de la disponibilité des stocks de planification familiale dans les établissements du secteur public.

الاستفادة من التكنولوجيا وسلسلة الإمداد في تحسين لوجستيات تنظيم الأسرة في باكستان

محمد طارق، أمبرين خان، كيهان موتلا

الخلاصة

الخلفية: استثمرت باكستان والوكالة الأمريكية للتنمية الدولية في تحسين بيانات سلسلة الإمداد بوسائل منع الحمل وتأمين السلع الخاصة بها. وفي عام 2011، أطلق أول نظام معلومات رقمي لإدارة لوجستيات وسائل منع الحمل، مما سهّل وضوح بيانات سلسلة الإمداد على المستوى الاتحادي للمرافق الصحية. ويتضمن النظام وحدات مدججة بشأن التنبؤ وتخطيط الإمدادات، وإدارة المخزون، والإبلاغ عن الاستهلاك، وأدوات تحليل المعلومات التجارية، والرسائل الإلكترونية الآلية، والتنبيهات باستخدام الرسائل النصية القصيرة. وباستخدام هذه الخصائص، يمكن لرسمي السياسات والمديرين الصحيين التنبؤ بالاحتياجات سنوياً، وشراء وسائل منع الحمل وفقاً لذلك.

الأهداف: هدفت هذه الدراسة إلى فهم المنصات التكنولوجية الحالية لوضوح بيانات سلسلة الإمداد المتعلقة بتنظيم الأسرة والتأثير المحتمل على تأمين السلع الخاصة بوسائل منع الحمل.

طرق البحث: استعرض المؤلفون المؤلفات غير الرسمية والمنشورة المتاحة عن وسائل منع الحمل والإمدادات في باكستان. واستخلصنا بيانات من نظام المعلومات الرقمي لإدارة لوجستيات وسائل منع الحمل، وقيّمنا المؤشرات، بما يشمل الإبلاغ عن الامتثال، ومعدلات نفاد المخزون المبلغ عنها، وأداء وسائل منع الحمل. وتم التحقق من صحة التحليل من خلال استعراض مؤشرات سلسلة الإمداد وتنظيم الأسرة، مثل متوسط الاستهلاك الشهري، وشهور المخزون، وفترة الحماية من الإنجاب.

النتائج: أسفر نظام المعلومات الرقمي لإدارة لوجستيات وسائل منع الحمل عن تحسن التوزيع والإنذار المبكر والمساءلة في أدنى مستويات سلسلة الإمداد المتعلقة بتنظيم الأسرة في القطاع العام. وعلى مستوى المرافق، ازداد توافر سلع تنظيم الأسرة من 40٪ في عام 2009 إلى 84٪ في عام 2018.

الاستنتاج: شهدت سلسلة الإمداد بوسائل منع الحمل نمواً كبيراً على مدى العقد الماضي لتلبية الدلائل المتزايدة في مجال الصحة الإنجابية لتوجيه القرارات الاستراتيجية؛ ويُعدّ نظام المعلومات الرقمي لإدارة لوجستيات وسائل منع الحمل عاملاً مساهماً رئيسياً في التحسينات المسجلة في توافر مخزونات تنظيم الأسرة في مرافق القطاع العام.

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A paradoxical change in economic inequality in presenting visual acuity between 2009 and 2014: a nonuseful decline

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Abstract

Background: Despite the widespread literature on health inequalities and their determinants, changes in health inequalities over time have not received enough attention.

Aims: To measure and decompose the over-time changes in economic inequality in presenting visual acuity measured using Logarithm of the Minimum Angle of Resolution.

Methods: We analysed 4706 participants who had complete data on presenting visual acuity and economic status in 2009 and 2014 in the Shahrood Eye Cohort Study. We measured changes in presenting visual acuity concentration indices and decomposed them using a longitudinal approach.

Results: Both the presenting visual acuity and economic status deteriorated between 2009 and 2014. The mean (standard deviation) for presenting visual acuity and economic status scores in 2009 versus 2014 were 0.090 (0.2) versus 0.103 (0.2) and 0.01 (1.0) versus 0.0005 (1.07), respectively. Presenting visual acuity concentration index (95% confidence interval) in the first versus second phases of the study were –0.245 (–0.212 to –0.278) versus –0.195 (–0.165 to –0.225), respectively. Longitudinal decomposition of this change in concentration indices during the 5-year period indicated that the most important contributor to reduction in economic inequality of presenting visual acuity was deterioration of presenting visual acuity among people with higher economic status due to their ageing.

Conclusion: Unexpectedly, reduction in economic inequality in presenting visual acuity was due to presenting visual acuity deterioration among the higher economic status group rather than its amelioration among the lower economic status group. Therefore, the needs of all socioeconomic groups should be considered separately to modify presenting visual acuity in each group and, consequently, reduce the economic inequality in presenting visual acuity.

Keywords: health inequality, economic inequality, longitudinal analysis, presenting visual acuity, socioeconomics

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Introduction

Evaluation of over-time changes in health inequalities and understanding determinants of these changes are key policy objectives for all governments (1). The condition-dependent nature of health necessitates analysis of health inequality changes over time using dynamic models based on longitudinal data (2). However, most previous studies have analysed changes in health inequalities using repeated cross-sections and static regression models (3–7). Decomposition of health inequalities using these static models cannot reveal dynamic links between health and its determinants (8).

We used the data collected in a cohort study and applied a dynamic decomposition method (8) to analyse the longitudinal changes in economic inequality in presenting visual acuity (PVA), as one of the health outcomes that have a strong and fully proved relationship with socioeconomic status (7,9–14). All of the previous studies were of a cross-sectional nature without paying

attention to the changes occurring over time. To the best of our knowledge, after the study by Allanson et al. (8), this is the first study to use the cohort data to conduct a longitudinal analysis of changes in inequality. By revealing the process of changes in inequalities over time and identifying the factors influencing such changes, we can provide health policy-makers with effective recommendations to design programmes and policies aimed at reducing these inequalities.

Methods

Study design

This study was performed using data collected by the Shahrood Eye Cohort Study (ShECS) (15). Among 6311 people who were invited to participate in ShECS, 5190 (82.2%) participated in the first phase of the study in 2009. Of these, 453 people were removed from the second phase of the study in 2014 due to death, immigration or reluctance

to continue. Thus, in the second phase, the examinations were performed on 4737 people (91.27%). Further details about ShECS are presented elsewhere (15).

In the present study, PVA, defined as vision in normal daily life conditions, whether corrected or not, was the outcome variable. In ShECS, this quantitative variable was measured using the Logarithm of the Minimum Angle of Resolution (LogMar). On this scale, a higher score means poorer vision. To cover the data for both eyes, the outcome variable was set as the PVA score in the better eye. Other studied variables were: age, sex, education (number of successfully completed years of education), marital status (married or unmarried), occupation (retired or not retired), diabetes, hypertension, smoking, medical insurance, body mass index and household assets.

Ethical approval

This study was approved by the Ethics Committee of Tehran University of Medical Sciences. ShECS, which was used as the source of data for present study, had been approved by the Ethics Committee of Shahrood University of Medical Sciences (Registration Code: IRB 8737).

Statistical analysis

Principal component analysis

Principal component analysis (PCA) was used to convert the variables used for the assessment of household assets into a quantitative variable, economic status (ES) score. Prior to PCA, the homogeneity of asset variables was measured using the Kaiser–Meyer–Olkin Measure of Sampling Adequacy and Bartlett's Sphericity Test. The Kaiser–Meyer–Olkin index for the first and second phases of the study was 0.735 and 0.726, respectively. Bartlett's Sphericity Test was significant for both phases ($P < 0.001$). Therefore, according to Williams et al. (16), home asset variables in both phases of the study were relevant and proper for the PCA. As a result, PCA was conducted on home assets in the first and second phases. As previously described (7), the ES variables in the first and second phases were formed by weighting the first component, which justified the highest variance in asset data (17).

Measuring inequality

Concentration index was calculated as twice the covariance between the outcome variable and the fractional rank in the socioeconomic status indicator variable divided by the mean of the outcome (18), and was used to measure economic inequalities in PVA and other variables. Computational details are presented in the Appendix section.

Decomposition of changes in the economic inequality in PVA by a dynamic method

When using a dynamic method, it is necessary only to use the longitudinal or follow-up data (8). This analysis must be performed only on the subjects with registered data on both the outcome and socioeconomic status variables. People who had no registered data on PVA or home assets in one or both phases of the study were excluded

from the analysis. Accordingly, a total of 482 people were excluded and the data collected on 4706 people were used in the analyses.

The decomposition of the change in inequality in this method was a hierarchical process. To simplify, we divided this process into two parts: nondeterministic decomposition and deterministic decomposition. In nondeterministic decomposition, the changes in the concentration indices between the two periods were decomposed using the following equation:

$$\Delta CI = M^R - M^H$$

where, M^R was the health-related income mobility and M^H income-related health mobility. Therefore, this equation implied that changes in inequality in an outcome over time resulted from changes in the health status of poor and wealthy people (health mobility) and changes in the positions of healthy and unhealthy individuals in income distribution (income mobility). Accordingly, M^H showed whether changes in health were favourable for poor or rich people. M^R showed whether changes in income were favourable for healthy or unhealthy people.

After determining the value of M^H (M^{PVA} in this study), it was necessary to decompose it in order to identify the share of changes in income (ES in this study) and other determinants in it via deterministic decomposition. The following steps were used for this decomposition. (1) Identifying short-run determinants of PVA change (determinants of changes in PVA from the first to second phase) using the Error Correction Model (ECM). This model allowed for lagged as well as contemporaneous responses to changes in ES and other PVA determinants. (2) Computing expected PVA in the equilibrium-steady state that was called long-run or equilibrium PVA function (PVA^*). (3) Computing equilibrium error, value of adjustment PVA in first phase toward PVA^* ($PVA^* - PVA^{phase\ 1}$). (4) Identifying long-run determinants of PVA change (determinants of equilibrium error). (5) Determining the contribution of short-run and long-run determinants of PVA changes in PVA mobility and consequently PVA inequality changes (more details on statistical analysis are presented in the Appendix).

Mathematically, it was possible to decompose M^R (M^{ES} in this study) and determine the contribution of determinants in the health-related income rank of individuals. Since the determinants of income variations are not routinely collected in health research, it was not possible to conduct such an analysis in the present study.

Results

The mean PVA (95% confidence interval; CI), measured based on the LogMAR scale, was 0.090 (0.084–0.096) and 0.103 (0.098–0.109) in the first and second phases of the study, respectively ($P < 0.001$).

The mean (standard deviation; SD) for age, education and body mass index in the first versus second phases of the study were 50.9 (6.2) versus 55.9 (6.2), 7.3 (4.7) versus 7.3 (4.7), and 28.4 (4.9) versus 28.9 (5.0), respectively. Table 1 presents the status of other independent variables in the first and second phases of the study. Comparing the data collected in the first and second phases, we observed a reduction in the number of individuals in the married subgroup and an increase in the retired subgroup during the study. The number of people with diabetes and hypertension nearly doubled during the study. There was also an increase in the number of insured people and smokers.

We constructed economic quintiles in each phase by dividing the ES into 5 groups. The distribution of people in economic quintiles in the first versus second phases of the study is shown in Figure 1. Due to the existence of tied data (observations having the same value) created by PCA, particularly in the first phase, the percentages differ from 20% for some quintiles.

The PVA concentration index (95% CI) in the first and second phases of the study was -0.245 (-0.212 to -0.278) and -0.195 (-0.165 to -0.225), respectively. Comparing these concentration indices indicated that economic inequality in PVA decreased by 0.05 between 2009 and 2014.

According to the nondeterministic decomposition of concentration indices changes during the 5-year period, M^{PVA} and M^{ES} were -0.08 and -0.03 , respectively. The negative values of M^{PVA} indicates that the deterioration of visual acuity between 2009 and 2014 was more concentrated among people with better economic status. In contrast, the negative value of M^{ES} showed that the deterioration of economic status during the study was more concentrated among people with poorer visual acuity score.

As the first step of deterministic decomposition of M^{PVA} , an ECM was run to identify short-run determinants of PVA changes. The variables that were entered into the final model are presented in the column 1 of Table 2. In line with the results of Allanson et al. (2), the significance level for the final model was set at 0.1. According to this model, improving ES and achieving control of hypertension in the second phase as compared with the first phase, and education and ES in the first phase prevented an increase in PVA. However, deterioration of ES and development of hypertension in the second phase as compared with the first phase, and age, diabetes and hypertension in the first phase helped to increase PVA in the second phase. The next step was to determine long-run or equilibrium PVA function (PVA^*). The determinants of PVA^* (presented in column 2 of Table 2) were obtained by dividing the coefficients of the baseline values of the variables in the ECM by the value of λ (absolute value of regression coefficient for PVA in the first phase). These coefficients represented estimates of the long-term effects of determinants on PVA changes.

After identifying the determinants of PVA^* , we used the coefficients of these determinants and calculated PVA^* for each person. The mean (SD) PVA^* was 0.235 (0.204). Since the PVA increased in the second phase compared to the first phase, the change that occurred in the mean PVA from the first to the second phase narrowed the gap between PVA in first phase (initial PVA) and PVA^* .

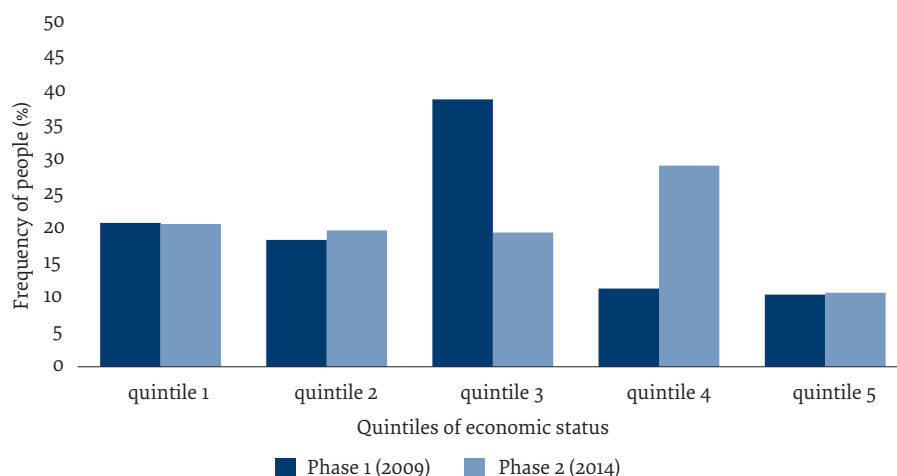
The results of M^{PVA} decomposition are presented in Table 3. According to Allanson et al. (8), only the factors whose changes between the 2 periods were significant in the ECM were used to calculate the contribution of the first component, the short-run determinants. Therefore, only 2 variables, changes in hypertension and changes in ES played a role in the first component. The total share of this component was -7.50% . Therefore, short-run changes in hypertension and ES contributed to the reduction in M^{PVA} and consequent increment in PVA inequality.

The second component, long-run determinants (determinants of adjustment of initial PVA toward PVA^*), made a considerable contribution to changes in PVA inequality. In this component, the long-run changes in age, diabetes and hypertension helped to increase M^{PVA} and consequently reduce the economic inequality in PVA. On the contrary, the long-run changes in education and ES helped to reduce M^{PVA} and consequently increase inequality in PVA. The long-run determinants of PVA

Table 1 Characteristics of participants in Shahroud Eye Cohort Study 2009–2014

Variable	Year	
	2009 No. (%)	2014 No. (%)
Married	4354 (92.5)	4215 (89.6)
Occupation (retired)	763 (16.2)	1276 (27.1)
Diabetes	575 (12.2)	1117 (23.9)
Hypertension	1799 (38.2)	2902 (61.7)
Cigarette smoking	566 (12.0)	671 (14.3)
Medical insurance	4435 (94.9)	4636 (98.5)
Household assets:		
Car	3009 (63.9)	3303 (70.2)
Motorcycle	1442 (30.6)	1019 (21.7)
TV/LED/LCD	4688 (99.6)	4679 (99.4)
Bathroom	4689 (99.6)	4682 (99.5)
Vacuum cleaner	4545 (96.6)	4614 (98.1)
Washing machine	4217 (89.6)	4471 (95.0)
Refrigerator	4692 (99.7)	4687 (99.6)
Computer	2953 (62.7)	2942 (62.5)
Telephone	4660 (99.0)	4573 (97.2)
Microwave	421 (9.0)	547 (11.6)
Dishwasher	271 (5.8)	379 (8.1)
Freezer ^a	–	2940 (62.5)
Internet access ^a	–	1909 (40.6)
Internet in home ^a	–	2081 (44.2)

^aDid not measure in first phase of study.

Figure 1 Distribution of people by economic quintiles in 2009 and 2014, Shahroud, Islamic Republic of Iran.

changes contributed to the increment in M^{PVA} and consequent reduction in PVA inequality.

Considering that the mean PVA^* was higher than the mean PVA in the first phase, the larger gap between the 2 scores indicated a more favourable condition. The mean (SD) gap between PVA^* and PVA in the first phase

in terms of economic quintiles is presented in Figure 2. This shows that the gap was larger in poorer than richer economic groups. In other words, there was a higher level of adjustment toward the equilibrium steady state in rich economic groups. This finding is consistent with the interpretation of the sum of the effects of the second component in Table 3 (adjustment toward PVA^*).

Table 2 Determinants of PVA change during 5 years by Error Correction Model and the implied equilibrium PVA function, Shahroud, Islamic Republic of Iran, 2009–2014

Variables	Error Correction Model		Equilibrium PVA function
	Coefficient	95% CI	Coefficient ^a
Hypertension changes			
Unchanged	Reference		
Developing	0.0001	-0.0095, 0.0098	
Achieving control	-0.0182**	-0.0352, -0.0012	
ES changes			
Unchanged	Reference		
Becoming poorer	0.0016	-0.0097, 0.0129	
Becoming richer	-0.0153***	-0.0259, -0.0048	
PVA 2009	-0.4110***	-0.5136, -0.3084	
Age 2009 (years)	0.0013***	0.0004, 0.0023	0.0032
Education (years) 2009	-0.0015**	-0.0028, -0.0003	-0.0036
Diabetes 2009	0.0343***	0.0140, 0.0550	0.0834
Hypertension 2009	0.0092*	-0.0016, 0.0201	0.0224
Economic quintiles 2009			
First (poorest)	Reference		Reference
Second	-0.0198***	-0.0332, -0.0063	-0.0482
Third	-0.0058	-0.0192, 0.0074	-0.0141
Fourth	-0.0137*	-0.0287, 0.0013	-0.0333
Fifth (richest)	-0.0188**	-0.0349, -0.0026	-0.0457
Constant	0.0014	-0.0450, 0.0477	0.0034

* $P < 1\%$, ** $P < 5\%$ and *** $P < 10\%$.

^aThese coefficients were obtained by dividing the coefficients of the baseline values of the variables in the Error Correction Model by the absolute value of PVA regression coefficient in the first phase in this model (0.4110).

ES = economic status; PVA = presenting visual acuity.

Table 3 Decomposition of ES-related PVA Mobility Index between 2009 and 2014, Shahroud, Islamic Republic of Iran

Component	Variable	Mobility index	Percentage contribution to M^{PVA} (%)
Short-run determinants	Hypertension changes		
	Unchanged (reference)		
	Developing	-0.0001	0.12
	Controlling	0.0021	-2.62
	Economic status changes		
	Unchanged (reference)		
	Becoming poorer	-0.0021	2.62
	Becoming richer	0.0061	-7.62
	Sum	0.0060	-7.50
	Economic status 2009		
long-run determinants (adjustment to equilibrium)	Age 2009	-0.1538	192.25
	Education (years)	0.0457	-57.12
	Diabetes 2009	-0.0082	10.25
	Hypertension 2009	-0.0073	9.12
	Economic status 2009		
	First Q (reference)		
	Second Q	-0.0054	6.75
	Third Q	0.0092	-11.50
	Fourth Q	0.0139	-17.38
	Fifth Q	0.0217	-27.13
Total explained	Constant	-0.0032	4.00
	Sum	-0.0874	109.25
Residual		-0.0814	101.75
Total		0.0014	-1.75
		-0.0800	100.0

ES = economic status; PVA = presenting visual acuity; M^{PVA} = ES-related PVA mobility index; Q = quintile.

Discussion

The results of measuring the economic inequality in PVA indicated that the PVA had a higher level of concentration among people with lower ES. This finding has also been reported by many other studies (9,10,19,20).

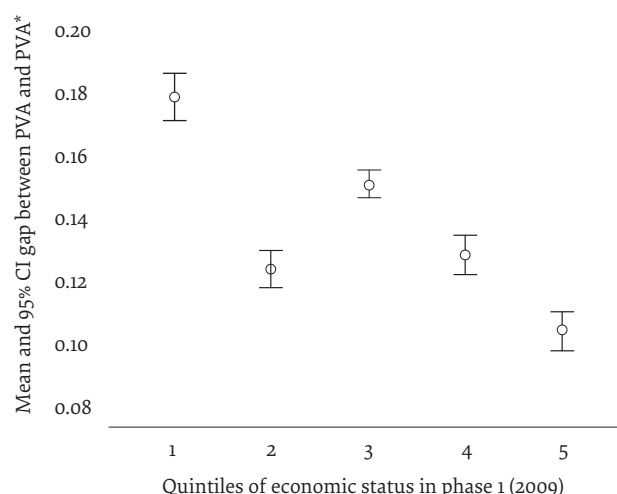
The present study showed that the economic inequality in PVA decreased by 0.05 between 2009 and 2014. This change in the economic inequality in PVA was decomposed by a longitudinal dynamic method. In nondeterministic decomposition, M^{PVA} was -0.08. This index shifted towards decreasing the economic inequality in PVA in the population. M^{ES} was -0.03. Therefore, this index moved toward increasing the economic inequality in PVA in the population. Because of the positive correlation between ES and health, this index is reported negative in most studies (21). Thus, M^{PVA} and M^{ES} moved toward decreasing and increasing the economic inequality in PVA, respectively. Eventually, in this bilateral struggle, M^{PVA} dominated and reduced inequality in PVA.

The results of M^{PVA} decomposition showed that the contribution of the changes in hypertension and ES during the study was positive. Therefore, the changes in these 2 variables contributed to increasing the economic

inequality in PVA. This was because the number of people who developed hypertension during the study was significantly higher than the number who achieved control of hypertension during the same period. The increase in PVA of people who developed hypertension during this time was 3.04 times higher than the number who recovered from hypertension during the same period. A high percentage of people whose ES remained unchanged during the study belonged to the first and second economic quintiles. There are confirmed relationships between hypertension and visual impairment (22), as well as between economic status and visual impairment (23). Therefore, increasing eye care in people with hypertension and facilitating delivery of preventive, diagnostic and therapeutic care services for people with poor ES can help to reduce the economic inequality in PVA.

The second component, that is, adjustment of initial PVA toward PVA*, a more unfavourable state, had the highest contribution to PVA inequality changes. This indicated that the changes in PVA from the first to the second phase of the study resulted in a reduced gap between the initial PVA and PVA*. The negative sign of the mobility index for this component shows that, firstly, this change led to an increase in M^{PVA} index and

Figure 2 Gap between presenting vision acuity in 2009 and presenting vision acuity in steady state according to quintiles of economic status in 2009, Shahroud, Islamic Republic of Iran.



CI = confidence interval; PVA = presenting visual acuity.

consequently helped to reduce inequality in PVA; and secondly, the highest level of adjustment of initial PVA towards PVA* occurred among more affluent people. In this component, the largest contribution was related to the age variable. Thus, the most important factor contributing to the reduction in economic inequality in PVA was the PVA score nearing its expected value in the equilibrium steady state in rich individuals due to their ageing. Therefore, the observed decline in economic inequality in PVA during the study did not result from a favourable change, such as improvement in visual acuity in poorer people; on the contrary, the change in PVA of richer people toward PVA* was the most important factor contributing to the reduction in inequality in PVA. In other words, at the beginning of the study, the poorer people were older than the richer people and other risk factors for visual impairment, such as sex (being female) and lower education, were more concentrated among

them, and consequently they had more unfavourable PVA. During the study, with the increase in the age of the participants, the status of the poorer people in terms of PVA remained almost stable. In contrast, the richer people experienced an increase in PVA score because of ageing and other factors. Hence, the gap between poor and rich people in terms of PVA decreased.

The most important strengths of this study were: the use of data obtained from a well-designed cohort study with carefully and continuously monitored data collection and considerable sample size to analyse the changes in inequality in a health outcome over time; the high response rate of the participants in both phases of the study; and applying a longitudinal data-based technique for analysis of over-time inequality changes. Nevertheless, the focus of our research on people aged 40–64 years could affect generalizability of the results.

Conclusion

This study showed a decrease in the economic inequality in PVA over a 5-year period. Although this reduction seemed to be a desirable change, longitudinal analysis revealed that this reduction in inequality was due to the deterioration of PVA in people with better ES and, consequently, the decrease in the difference between those with a poor ES and those with a better ES in terms of PVA. Therefore, we suggest that it is desirable to consider the needs of all socioeconomic groups when designing prevention and treatment programmes for visual impairment, to specifically modify visual acuity in each group and, consequently, reduce the economic inequality in visual acuity.

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Competing interests: None declared.

Changement paradoxal dans l'inégalité économique en matière de correction des vices de réfraction entre 2009 et 2014 : une baisse non significative

Résumé

Contexte : Malgré l'importance de la littérature, les inégalités en matière de santé et leurs déterminants, les changements observés dans ce domaine au fil du temps n'ont pas fait l'objet de suffisamment d'attention.

Objectifs : Mesurer et décomposer les changements survenus au fil du temps en matière d'inégalités économiques dans l'acuité visuelle à l'examen mesurée à l'aide du logarithme de l'angle minimal de résolution.

Méthodes : Nous avons analysé 4706 participants qui disposaient de données complètes sur l'acuité visuelle à l'examen et le statut économique en 2009 et 2014 dans l'étude de cohorte oculaire de Shahroud. Nous avons mesuré les changements dans les indices de concentration pour l'acuité visuelle à l'examen et les avons décomposés en utilisant une approche longitudinale.

Résultats : L'acuité visuelle à l'examen et le statut économique se sont tous deux détériorés entre 2009 et 2014. Les scores moyens (écart-type) pour l'acuité visuelle à l'examen et le statut économique présentés en 2009 par rapport à 2014 étaient de 0,090 (0,2) contre 0,103 (0,2) et de 0,01 (1,0) contre 0,0005 (1,07), respectivement. L'indice de concentration pour l'acuité visuelle à l'examen (intervalle de confiance à 95 %) dans la première et la deuxième phase de l'étude était de -0,245 (-0,212 à -0,278) contre -0,195 (-0,165 à -0,225), respectivement. La décomposition longitudinale de ce changement dans les indices de concentration au cours de la période de cinq ans a indiqué que l'élément le plus important contribuant à la réduction de l'inégalité économique de l'acuité visuelle à l'examen était la détérioration de celle-ci chez les personnes ayant un statut économique plus élevé à cause de leur vieillissement.

Conclusion : De manière inattendue, la réduction de l'inégalité économique dans l'acuité visuelle à l'examen était due à la détérioration de cette dernière dans le groupe de statut économique supérieur plutôt qu'à son amélioration dans le groupe de statut économique inférieur. Les besoins de tous les groupes socio-économiques doivent donc être considérés séparément pour modifier l'acuité visuelle à l'examen dans chaque groupe et, par conséquent, réduire l'inégalité économique.

التغير التناقضي في التفاوت الاقتصادي في تصحيح الانكسار البصري بين عامي 2009 و 2014: انخفاض غير مفيد

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الخلاصة

الخلفية: رغم انتشار الوعي بعدم المساواة الصحية ومحدداتها، لم تحظ التغيرات في عدم المساواة الصحية على مر الزمن بالاهتمام الكافي.

الأهداف: هدفت هذه الدراسة إلى قياس التغيرات على مر الزمن في التفاوت الاقتصادي في حدة البصر المُستَعْلَنة المقاسة باستخدام لوغاريتم زاوية الوضوح الصغرى، وتحليلها.

طرق البحث: أجرينا تحليلاً على 4706 مشاركاً كانت لديهم بيانات كاملة عن "حدة البصر المُستَعْلَنة" والنقاط الاقتصادية في عامي 2009 و 2014 في دراسة شهروء الأترابية للعيون. وقسنا التغيرات في مؤشرات تركيز حدة البصر المُستَعْلَنة، وحللناها باستخدام نهج طولي.

النتائج: تدهور كل من "حدة البصر المُستَعْلَنة" والحالة الاقتصادية بين عامي 2009 و 2014. وكان متوسط (الانحراف المعياري) نقاط حدة البصر المُستَعْلَنة والنقاط الاقتصادية في عام 2009 مقارنة بعام 2014 هو 0.090 (0.2) مقابل 0.103 (0.2)، و 0.01 (1.0) مقابل 0.0005 (1.07) على التوالي. وبلغ مؤشر تركيز حدة البصر المُستَعْلَنة (فاصل الثقة 95٪) في المرحلة الأولى مقابل المرحلة الثانية من الدراسة -0.245 (-0.212 إلى -0.278) مقابل -0.195 (-0.165 إلى -0.225) على التوالي. ويشير التحليل الطولي لهذا التغير في مؤشرات التركيز خلال فترة 5 سنوات إلى أن أهم عامل مساهم في الحد من التفاوت الاقتصادي "لحدة البصر المُستَعْلَنة" هو تدهور "حدة البصر المُستَعْلَنة" بين الأشخاص ذوي النقاط الاقتصادية الأعلى نظراً لتقدمهم في السن.

الاستنتاج: على غير متوقع، كان الانخفاض في التفاوت الاقتصادي في "حدة البصر المُستَعْلَنة" ناجماً عن تدهور "حدة البصر المُستَعْلَنة" بين الفئة ذات النقاط الاقتصادية الأعلى وليس تحسناً بين الفئة ذات النقاط الاقتصادية الأدنى. ولذلك، ينبغي النظر في احتياجات جميع الفئات الاجتماعية الاقتصادية على نحو منفصل، لتعديل "حدة البصر المُستَعْلَنة" في كل فئة، ومن ثم الحد من التفاوت الاقتصادي في "حدة البصر المُستَعْلَنة".

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Salt content of processed foods in the Islamic Republic of Iran, and compliance with salt standards

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Abstract

Background: The World Health Organization recommends a maximum daily salt intake of 5 g for adults; the Islamic Republic of Iran has national standards for salt content of foods.

Aims: This study aimed to determine the salt content of industrial (made in large-scale food companies) and non-industrial (made in local stores using traditional methods) foods in Tehran province and compare it with the Iranian national standards.

Methods: We determined the salt content of 555 industrial and non-industrial products from parts of Tehran province in 2016 and 2018. The types of foods examined were: canned vegetables, industrial and non-industrial pickled vegetables, industrial and non-industrial tomato paste/tomato sauce, industrial and non-industrial nuts, and non-industrial barberry juice. The salt content of each product and its compliance with Iranian national standards was evaluated.

Results: The salt content of industrial tomato paste/sauce in 2016 (2.05 g/100 g) and non-industrial tomato paste/sauce in 2018 (2.37 g/100 g) was higher than the Iranian standard (1.5/2.0 g/100 g). The mean salt content of both industrial (1.97 g/100 g) and non-industrial (2.16 g/100 g) nuts was higher than the Iranian standard (1.88 g/100 g), as was the mean salt content of non-industrial juice (0.79 g/100 mL versus 0.25 g/100 mL). In 2018, only 48% and 40% of industrial and non-industrial tomato pastes/sauces met the Iranian standard. Overall, industrial products conformed better with the national standard than non-industrial products.

Conclusions: Efforts are needed to reduce the salt content of processed food in the Islamic Republic of Iran and ensure they meet the Iranian standards.

Keywords: salt, dietary sodium chloride, food products, Iran.

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Introduction

According to the scientific literature, one of the main factors that causes chronic noncommunicable diseases (such as cardiovascular disease) is the excessive use of processed food. Production and processing of these types of foods have spread around the world (1). Salt (sodium chloride) is a component of processed food and excessive consumption of these foods results in a high intake of salt. According to extensive research, there is a direct relationship between salt consumption and blood pressure (2), and a reduction in daily salt intake of 4.4 g can result in lower blood pressure (3). High blood pressure is one of the main factors associated with death in adults globally. Furthermore, the risk of cardiovascular diseases increases in parallel with increases in blood pressure. In addition to its effect on blood pressure, salt can lead to other health conditions, such as kidney stones, urinary calcium excretion, disorders of bone metabolism, gastric cancer, cataracts and asthma (2,4). According to the World Health

Organization (WHO) in 2018, in order to improve public health, the maximum recommended daily salt intake is 5 g for adults (5). Salt is a natural component of many foods such as milk, cream and eggs, but processed products, including bread, processed meat (e.g. sausages), nuts, canned and pickled products, and fermented dairy products, contain a higher concentration of salt (6). While salt poses health risks, this compound is also a vital element in biological activity and food processing, including regulating the osmotic pressure of a living cell and producing palatable food. Salt is a food preservative which increases food safety by reducing the water activity of a food. Salt also intensifies the taste and aroma of food and can enhance textural properties, alter the consistency of the food and influence food appearance and feel. Given these effects of salt on food, reducing the amount of salt in processed food can reduce food acceptability (6).

The salt consumption of Iranians is much higher than the WHO recommended amount (7). Many Iranians do not know about the health hazards of salt and the

safe amount to consume daily, and do not have any knowledge about how much salt enters the body through consumption of processed food. Therefore, monitoring the salt content of foods that are distributed in the supermarkets is one way that can raise the awareness of society and improve public health (8). In this regard, the Iranian Ministry of Health and Medical Education established a national committee to oversee decisions and activities to monitor and reduce factors that increase the risk of noncommunicable diseases in the country and to develop new regulations in line with WHO recommendations.

Therefore, this study aimed to determine the salt content of the most commonly consumed processed foods in the Islamic Republic of Iran and evaluate the compliance of each food group with the national salt standards (9–11).

Methods

We assessed the salt content of 555 types of processed food available in Tehran province in 2016 and 2018. We categorized food products into eight groups: non-industrial fruit juices (28 products), industrial tomato paste and sauce (54 products), non-industrial tomato paste and sauce (21 products), canned vegetables (76 products), industrial pickles (88 products), non-industrial pickles (112 products), industrial processed nuts (56 products) and non-industrial processed nuts (120 products). Industrial products are those made in large-scale food companies

and non-industrial products are those made in local stores using traditional methods.

The salt content of these products was evaluated according to the national standard of the Islamic Republic of Iran (9,12).

An ANOVA (with Duncan post hoc, repeated measures, 2018) was used to determine significant differences between each food group produced in 2016 and 2018 and to determine significant differences with the Iranian national standard.

Results

According to the Iranian national standard for canned vegetables, the permitted level of salt is 1.5–2.0 g/100 g (9). The mean salt content of industrial canned vegetables was 1.1 g/100 g and 1.2 g/100 g in 2016 and 2018, respectively. In 2016, all of the samples of industrial canned vegetables complied with the Iranian national standard, while about 4% of them contained more than the standard level in 2018 (Figure 1). Based on the serving size of canned foods (125 g), the average daily per capita intake of salt and sodium is 1.5 g and 585 mg, respectively (Table 1). The statistical results presented in Table 2 show that the mean salt content of canned vegetable in 2016 and 2018 were statistically different.

The mean salt content of industrial pickles complied with the Iranian national standard in 2016, but in 2018, about 4% of industrial pickles did not (Figure 1). Based on the serving size of industrial pickles (50 g), the average

Figure 1 Compliance (%) of industrial and non-industrial food products with the Iranian national standard: a) 2016; b) 2018

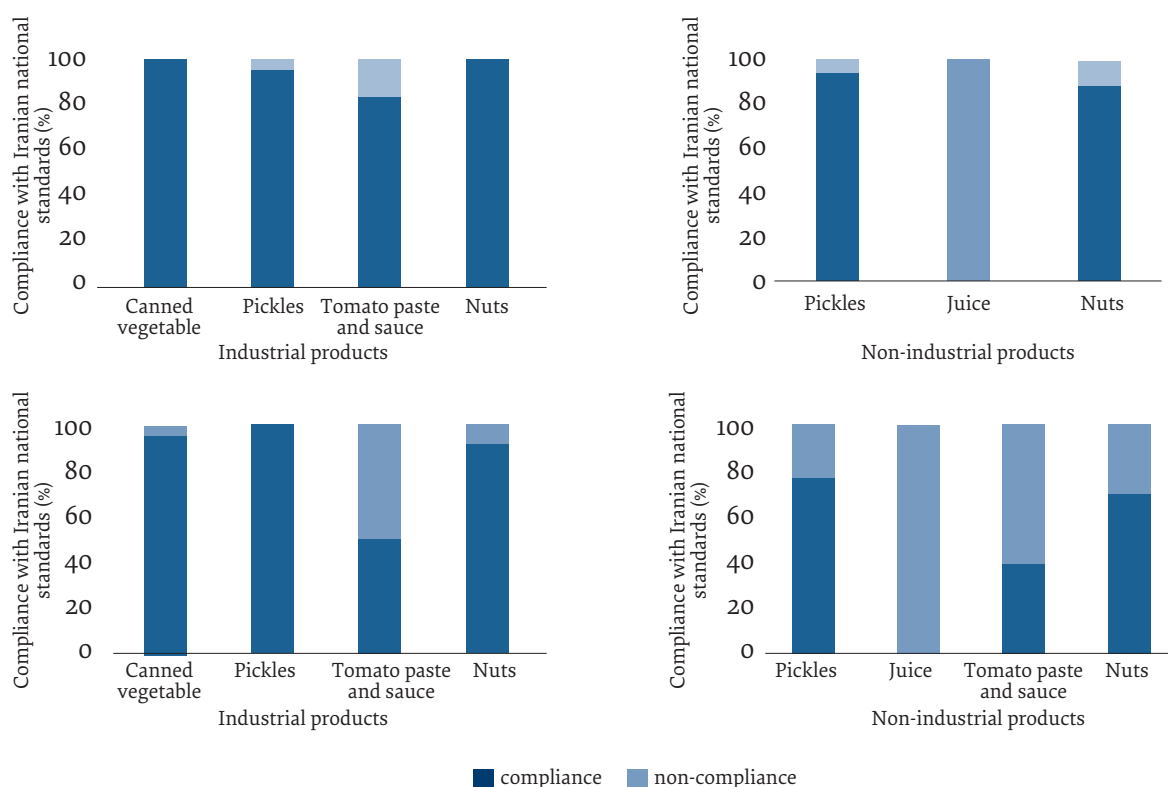


Table 1 Daily per capita intake of each food product and the average salt intake based on the salt content of each food product monitored, Islamic Republic of Iran, 2018

Food product	Mean salt content, g/100 g	Daily serving size per person	Daily per capita intake of:	
			Salt, g	Sodium, mg
Canned vegetable	1.2	125 g	1.5	585
Industrial pickle	2.4	50 g	1.2	468
Non-industrial pickle	3.2	50 g	1.6	624
Industrial tomato paste and sauce	1.8	15 g	0.3	171.6
Industrial nut	1.1	40 g	0.4	173.2
Non-industrial nut	2.3	40 g	0.9	354.1
Non-industrial juice	0.8	300 mL	2.4	924.3

per capita intake of salt and sodium was 1.2 g and 468 mg, respectively (Table 1).

The compliance with the Iranian national standards for salt content of industrial tomato paste was 83% and 48% in 2016 and 2018, respectively (Figure 1). There were no significant differences between the salt content of tomato paste and sauce in 2016 and 2018 (Table 2). The standard compliance rate of non-industrial tomato sauces was 40% in 2018, which was lower than the industrial products (Figure 1).

With regard to nuts, industrial salted sunflower seeds had the highest mean salt content of nuts while industrial salted pistachios and roasted pistachios had the lowest. However, one brand of industrial pumpkin seed had the lowest salt content, while another brand of pumpkin seed had the highest salt content. As regards non-industrial nuts and seeds, the salt content of some samples was more than the standard allowable value in 2016, including pumpkin seeds, Japanese seeds and cashew nuts. In 2018, the salt content of pumpkin seeds, Japanese seeds, sunflower seeds and watermelon seeds was more than the permitted level. The compliance of non-industrial nuts with the Iranian national standard was 88% and 72% in 2016 and 2018, respectively.

There is no determined standard for salt content of pomegranate juice, blueberry juice, blackberry, sour

cherry juice and plum juice; however, the evaluation of the salt content of barberry juice showed that it was more than permitted value, especially in 2018.

Discussion

Our findings show that non-industrial products had a lower rate of compliance with the Iranian standards. Thus, non-industrial products are more likely to be harmful to sensitive and vulnerable people such as elderly people, children and people with high blood pressure and cardiovascular disease. The Islamic Republic of Iran is a large country with a variety of cultures and dietary behaviours. Our study determined that some food formulation should be revised to improve public health in the country. Moreover, as sodium imposes health risks, determining the sodium content of food products should be a regulation in food industries. In the Islamic Republic of Iran, salt levels in non-industrial processed foods are much higher than in industrial processed foods, which suggests that people should be encouraged to consume industrial food products.

An unhealthy diet is one of the risk factors that can influence the public health of a country (6). Diet has more effect on the health of people of all ages than other factors including physical inactivity, excessive use of

Table 2 Mean salt content of monitored food products in the Islamic Republic of Iran in 2016 and 2018 and the Iranian national standards for salt content

Food product	Mean (SD) salt content, g/100 g		Iranian national salt targets, g/100 g ^a
	2016	2018	
Canned vegetables	1.10 (0.48)	1.2 (0.4)	1.905
Industrial pickled vegetables	2.36 (1.11)	2.4 (0.77)	4.000
Non-industrial pickled vegetables	2.38 (0.96)	3.2 (1.07)	4.000
Industrial tomato paste/tomato sauce	2.05 (1.33)	1.78 (0.37)	1.500/2.000
Non-industrial tomato paste/tomato sauce	Not monitored	2.37 (1.03)	1.500/2.000
Industrial nuts	0.80 (0.45)	1.97 (1.31)	1.884
Non-industrial nuts	1.77 (1.73)	2.16 (2.08)	1.884
Non-industrial barberry juice (g/100 mL)	0.27 (0.24)	0.79 (0.49)	0.250

SD: standard deviation.

^aIranian national salt targets (9–12).

No significant differences were found between the 2016 and 2018 salt levels for any of the food products ($P > 0.05$).

the alcoholic products and smoking (13). Indeed, health organizations in the Islamic Republic of Iran, headed by the Iranian Ministry of Health and Medical Education, are trying to decrease these health risk factors (13,14). Salt is an important factor for controlling body function, but excessive salt intake leads to noncommunicable diseases (15). WHO recommends consuming 2000 mg (2 g) of sodium a day and the American Heart Association advises a much lower intake of sodium (1.5 g) a day (16,17).

One way to reduce the salt content of food products is a gradual reduction of salt in each food product. Gradual reduction of salt in industrial and non-industrial food products, and distributing foods with lower salt content can decrease the salt intake in society and improve public health (18). A study in 2003 showed that a gradual decrease in salt in bread of 30% over 6 weeks did not affect the acceptability of the bread for consumers (19). As a gradual reduction in salt content of food products is a time-consuming process, food producers have looked for other ways to reduce sodium in food products (20). For example, using potassium chloride can produce low-sodium products. In addition to reducing sodium intake, potassium chloride also lowers blood pressure (21). Replacement of sodium chloride with potassium chloride is limited as the high concentrations of potassium chloride results in a metallic, bitter taste in the product (22). Arginine is also a salt taste enhancer. This amino acid provides more than twice as much salty taste as sodium chloride. The combination of arginine and aspartate can increase the salinity of a food product (23).

Between 70% and 95% of the salt present in a food enters the body without contact with the taste buds and cannot create a salty taste when swallowed. Normally, the sodium in a food must be dissolved to create a salty taste.

In addition, there is a direct relationship between the rate of dissolving of the salt crystals and the sensation of the salty taste. By reducing the size of the salt crystal, the effective surface area of the crystal increases, and salt size and morphology have been shown to be important factors in the intensity of the salty taste (22). By reducing the size of the salt crystal, the salty taste sensation process is faster and the intensity of the saltiness is also higher. Furthermore, crystals with pyramid, flat and clumped morphologies create more salinity than regular cubed crystals. Therefore, it is possible to reduce the amount of salt consumption in food products, and hence reduce the harmful effects of salt on public health in society, by producing salts with different structures. It is also possible to increase the salinity by using aromatic compounds. The mechanism of action of this phenomenon is not well known. However, research has shown that areas of the brain that cause taste in the mouth are stimulated and activated by flavourings and aromas (22,24,25).

The Iranian national standard salt targets are higher than the WHO recommended level. Indeed, revisions are required to decrease the Iranian standard salt target. Moreover, the Iranian national standard only measures the salt content in foods, but it is better to determine a permitted sodium level and measure its content in food products. This is an important measure in food production for improving the public health.

In addition to regulation to control the level of salt/sodium in food and therefore in people's diet, consumers' lifestyles should be modified to lower their salt intake and decrease their risk of noncommunicable diseases. Further studies are needed to assess the effect of salt reduction on consumer acceptance.

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Teneur en sel des aliments transformés en République islamique d'Iran et respect des normes relatives au sel

Résumé

Contexte : L'Organisation mondiale de la Santé recommande un apport quotidien maximal en sel de 5 g pour les adultes, et la République islamique d'Iran a établi des normes nationales pour la teneur en sel des aliments.

Objectifs : La présente étude visait à déterminer la teneur en sel des aliments industriels (fabriqués par de grandes entreprises alimentaires) et des aliments artisanaux (fabriqués dans des magasins locaux selon des méthodes traditionnelles) dans la province de Téhéran et à la comparer aux normes nationales iraniennes.

Méthodes : Nous avons déterminé la teneur en sel de 555 produits industriels et artisanaux provenant de diverses régions de la province de Téhéran en 2016 et 2018. Les types d'aliments examinés étaient les suivants : légumes en conserve, pickles industriels et artisanaux, coulis de tomate/sauce tomate industriels et artisanaux, noix industrielles et artisanales et jus d'épine-vinette artisanal. La teneur en sel de chaque produit et sa conformité aux normes nationales iraniennes ont été évaluées.

Résultats : La teneur en sel des coulis de tomate/sauce tomate industriels en 2016 (2,05 g/100 g), coulis de tomate/sauce tomate artisanaux en 2018 (2,37 g/100 g) était supérieure à la norme iranienne (1,5/2,0 g/100 g). La teneur moyenne en sel des noix industrielles (1,97 g/100 g) et noix artisanales (2,16 g/100 g) était supérieure à la norme iranienne (1,88 g/100 g), tout comme la teneur moyenne en sel du jus artisanal (0,79 g/100 ml contre 0,25 g/100 ml). En 2018, seulement 48 % et 40 % des coulis/sauce tomate industriels et artisanaux étaient conformes à la norme iranienne. Dans l'ensemble, les produits industriels répondaient mieux à la norme nationale que les produits artisanaux.

Conclusions : Des efforts sont nécessaires pour réduire la teneur en sel des aliments transformés en République islamique d'Iran et s'assurer qu'ils sont conformes aux normes iraniennes.

محتوى الملح في الأغذية المصنعة في جمهورية إيران الإسلامية، والامتثال لمعايير الملح

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الخلاصة

الخلفية: توصي منظمة الصحة العالمية بألا يتجاوز الحد الأقصى من مدخول الملح 5 جرامات للبالغين يوميًا، وتضع جمهورية إيران الإسلامية معايير وطنية لمحتوى الملح في الأغذية.

الأهداف: هدفت هذه الدراسة إلى تحديد محتوى الملح في الأغذية المصنعة الصناعية والأغذية المصنعة التي تنتجها النقابات المهنية في محافظة طهران، ومقارنته بالمعايير الوطنية الإيرانية.

طرق البحث: حددنا محتوى الملح في 555 منتجًا صناعيًا ونقائياً من أنحاء مختلفة في محافظة طهران. وشملت أنواع الأغذية التي تم فحصها: الخضروات المعلبة، والخضروات المخللة الصناعية وغير الصناعية، ومعجون/صلصة الطماطم الصناعية وغير الصناعية، والمكسرات الصناعية وغير الصناعية، وعصير البرباربي غير الصناعي.

النتائج: كان متوسط محتوى الملح لكل منتج هو: الخضروات المعلبة (1.1٪)، والمخللات الصناعية (2.4٪)، والمخللات التي تنتجها النقابات المهنية (2.3٪)، ومعجون/صلصة الطماطم الصناعية (2.5٪)، ومعجون/صلصة الطماطم الذي تنتجها النقابات المهنية (2.4٪)، والمكسرات الصناعية (1.1٪)، والمكسرات التي تنتجها النقابات المهنية (2.2٪)، والعصير الذي تنتجها النقابات المهنية (0.8٪). وكان الامتثال لمعيار الملح الإيراني منخفضًا بالنسبة لمعجون وصلصة الطماطم في عام 2018 (لم يستوف المعيار سوى 48٪ و 40٪ من المنتجات الصناعية والتي تنتجها النقابات المهنية على التوالي). وتوافقت المنتجات الصناعية مع المعايير الوطنية بصورة أفضل من المنتجات النقابية.

الاستنتاجات: يلزم بذل جهود للحد من محتوى الملح في الأغذية المصنعة في جمهورية إيران الإسلامية وضمان استيفائها للمعايير الإيرانية.

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Knowledge, attitudes and practices of pharmacists about pharmacovigilance, Libya

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Abstract

Background: The concept of pharmacovigilance is not well known in Libya and its practice is still in the early stages.

Aims: This study aimed to determine the knowledge, attitudes and practices of pharmacists in Tripoli, Libya about pharmacovigilance and the reporting of adverse drug reactions.

Methods: A cross-sectional study was conducted from October 2019 to February 2020 of working pharmacists randomly selected from pharmacies in Tripoli. Participants were eligible for inclusion if they had a degree or diploma in pharmacy from a recognized university or institute. Data were collected using a validated self-administered questionnaire.

Results: Of 500 pharmacists selected, 408 completed the questionnaire. The pharmacists' knowledge of pharmacovigilance and reporting of adverse drug reactions was poor overall: only 28.9% correctly defined pharmacovigilance and 14.7% knew about the existence of a centre for pharmacovigilance in Libya. The attitudes of the pharmacists to pharmacovigilance was positive: 77.2% believed that pharmacovigilance needed to be included in the pharmacy curriculum and 73.0% said that they would practice pharmacovigilance if trained. Pharmacists depended mostly on drug information leaflets to update their knowledge on adverse drug reactions.

Conclusion: Given the pharmacists' low level of knowledge about pharmacovigilance but their readiness to become involved if trained, training programmes should be introduced for practising pharmacists to improve their knowledge and encourage their active participation in pharmacovigilance. Regulators need to reinforce the importance of reporting adverse drug reactions and implement pharmacovigilance policies in the Libyan health care system.

Keywords: pharmacovigilance, adverse drug reactions, pharmacists, knowledge and attitudes, Libya

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Introduction

Pharmacovigilance, as defined by the World Health Organization (WHO), is the “science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other medicine-related problem” (1). WHO defined an adverse drug reaction as “a response to a medicine which is noxious and unintended, and which occurs at doses normally used in man...” (2). Data from several studies have shown that adverse drug reactions were linked to 6.5% of extended hospitalizations and they are considered an important cause of death in the United Kingdom of Great Britain and Northern Ireland (3). The influence of health care specialists with regard to adverse drug reactions is substantial and has encouraged ongoing ascertainment of the benefit-risk percentage of some drugs (4). Several approaches have been implemented to detect adverse drug reactions, such as spontaneous reporting which relies on health care professionals detecting and taking the initiative to report an adverse drug reaction. This approach is considered an effective method that has contributed to greater pharmacovigilance in many countries (5).

One of the challenges of reporting adverse drug reactions is to build a culture of reporting among the health care personnel, particularly among the pharmacists, as they are more involved with patient care. Currently, reporting of adverse drug reactions in Libya is low mainly because of lack of awareness, training, and time limitations, and Libyan community pharmacists limit their role to simply dispensing marketed preparations (6,7). Few studies in Libya have been published on the reporting of adverse drug reactions by prescribers and health care professionals (8). Therefore, we aimed to evaluate the knowledge, attitudes and practices of working Libyan pharmacists about pharmacovigilance and reporting of adverse drug reactions.

Methods

Study design, setting and sample

This was a descriptive cross-sectional study of a randomly selected sample of registered pharmacists in Tripoli. Participants were eligible for inclusion in this survey if they had graduated with a degree in pharmacy from a recognized university, and gave their consent to partici-

pate in the study. Pharmacy assistants without a pharmacy degree were excluded.

Sample size was calculated using a 5% margin of error and 95% confidence level, giving a sample size of 500 (9,10).

Data collection

We conducted a survey study during October 2019 to February 2020 using a prevalidated questionnaire. The questionnaire was validated on a sample of three specialists in the field of clinical pharmacy at the University of Tripoli, and their comments were taken into consideration to revise the questionnaire.

Participants were informed about the objectives of the survey in a letter attached to the questionnaire, which we delivered and collected by hand.

The questionnaire included information on demographic characteristics of the pharmacists and 18 survey items organized into two sections: 13 knowledge questions and 5 attitude questions. While yes/no questions tested the practice of adverse drug reactions reporting among the participants.

For knowledge, a score of ≥ 9 out of 13 questions was considered good knowledge, and for attitude, a score of ≤ 3 was considered poor. A yes answer was scored 1, a no answer was scored zero. We also asked pharmacists about their primary source of information to update their knowledge on adverse drug reactions.

Statistical analysis

Results are reported as frequencies and percentages.

Ethical considerations

This study was approved by the ethical committee of the Department of Anaesthesia and Intensive Care, Faculty of Medical Technology, University of Tripoli, Libya (Ref No. 1102/2020).

Results

The questionnaire was distributed to 500 pharmacists, 408 of whom returned the completed questionnaire (81.6% response rate). As shown in Table 1, just over half the respondents (54.9%) were women and were 20–30 years in age. About three quarters of the pharmacists (74.5%) had a bachelor degree and 59.8% had 1–10 years of work experience.

Knowledge of and attitude to reporting adverse drug reactions and pharmacovigilance were generally low (Table 2). For only one knowledge questions did more than 50% of the pharmacists know the correct response: female patients should be asked if they are pregnant when dispensing medications to them (71.3%). Only 28.9% of respondents correctly defined pharmacovigilance and 14.7% knew that there is a centre for pharmacovigilance in Libya. As regards adverse drug reactions, only 46.1% of the respondents correctly defined adverse drug reactions and 14.7% knew how to report such reactions. However, only 8.8% had actually reported an adverse drug reactions.

As regards attitude to pharmacovigilance, 38.7% thought that not enough importance is given to pharmacovigilance in the pharmacy curriculum and 40.2% thought that it is a responsibility of pharmacists to report adverse drug reactions. However, only 45.6% of the pharmacist thought that information on how to report adverse drug reactions should be taught to undergraduate pharmacy students. Finally, for the question on serious adverse drug reactions being known before a medicine is marketed, 41.1% of the respondents answered correctly and 28.4% knew that the reason for not reporting a suspected adverse drug reaction was due to the uncertainty of its association with the drug.

Regarding the results of pharmacovigilance attitude-based questions, the overall correct answers were good: 57.8% of pharmacists believed that reporting adverse drug reactions was an essential role of pharmacists and 77.2% thought that pharmacovigilance should to be included in the pharmacy curriculum and 90.0% believed that reporting adverse drug reactions must be made compulsory. As regards applying pharmacovigilance themselves, 73% said that they would practice pharmacovigilance if trained.

As shown in Figure 1, the pharmacists mainly relied on drug information leaflets to update their knowledge on adverse drug reactions (42.2%). Other sources included reference and text books (20.6%) and the internet (14.2%).

Discussion

To the best of our knowledge, this is the first study to explore the knowledge, attitudes and practices of Libyan

Table 1 Demographic characteristics of the pharmacists, Tripoli, Libya

Variable	No. (%) (n = 408)
Sex	
Male	184 (45.1)
Female	224 (54.9)
Age (years)	
20–30	230 (56.4)
31–40	152 (37.3)
41–50	26 (6.4)
Qualification	
Institute diploma	54 (13.2)
Bachelor degree	304 (74.5)
Postgraduate degree	50 (12.3)
Experience (years)	
< 1	72 (17.6)
1–5	160 (39.2)
6–10	84 (20.6)
> 10	92 (22.5)

Table 2 Knowledge and attitude of pharmacists about pharmacovigilance, Tripoli, Libya

Items	No. (%)
Knowledge of pharmacists of pharmacovigilance	
<i>Correct answer</i>	
1. Do you know what pharmacovigilance is?	118 (28.9)
2. I know that there is a centre of pharmacovigilance in Libya.	60 (14.7)
3. I know about adverse drug reactions.	188 (46.1)
4. I know how to report adverse drug reactions to the relevant authorities in Libya.	60 (14.7)
5. Do you know that a responsibility of pharmacists is to report adverse drug reactions?	164 (40.2)
6. Pharmacists are usually the first point of contact for people to report an adverse drug reaction.	243 (59.6)
7. Patient should be advised about adverse drug reactions every time their medications are dispensed.	182 (44.6)
8. Female patients should be asked if they are pregnant when dispensing medications to them.	291 (71.3)
9. Pharmacy students should be taught how to report adverse drug reactions.	186 (45.6)
10. All serious adverse drug reactions are known before a medicine is marketed.	168 (41.2)
11. Reason for a pharmacist not reporting a suspected adverse drug reaction is due to the uncertainty of its association with the drug.	116 (28.4)
Attitude of pharmacists to pharmacovigilance	
<i>Positive attitude</i>	
12. Reporting adverse drug reactions is an essential role of the pharmacist.	236 (57.8)
13. Pharmacovigilance needs to be included in pharmacy curriculum.	315 (77.2)
14. Reporting adverse drug reaction must be made compulsory.	367 (90.0)
15. I would practice pharmacovigilance if trained.	298 (73.0)
16. Have you ever reported an adverse drug reaction?	36 (8.8)
17. Do you think too little importance has been given to pharmacovigilance in the pharmacy curriculum?	158 (38.7)
18. With my present knowledge, I am well prepared to report any apparent adverse drug reaction in my future practice.	240 (58.8)

pharmacists about pharmacovigilance and adverse drug reactions.

Overall, the attitude of the pharmacists was better than their knowledge. This is not surprising as pharmacy students in Libya are not adequately exposed to pharmacovigilance in their curricula. Moreover, pharmacy students have received more training on detection, understanding and prevention of adverse drug reactions in their syllabus.

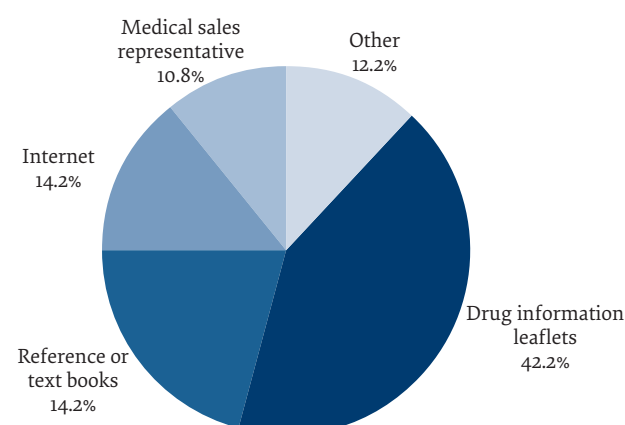
Overall, the knowledge of reporting adverse drug reactions and pharmacovigilance was low. Our results are in agreement with studies conducted in Saudi Arabia and Sudan (11,12). However, our results differ from those of studies conducted in Jordan, Kuwait, Lebanon and Qatar where higher levels of knowledge on pharmacovigilance were reported (13–16).

The concept of pharmacovigilance and the presence of a pharmacovigilance centre in Libya were not well known. This finding supports the suggestion that the Libyan pharmacovigilance system is still in its infancy, and governmental authorities may treat these systems as a low priority with insufficient specialists and financial resources (6).

Most of the participants thought that reporting of adverse drug reactions should be made compulsory and that pharmacovigilance needs to be included in curriculum. Our results are in agreement with earlier surveys that identified reporting of adverse drug reactions as a professional obligation that requires ethical commitment by health care professionals (11,17).

About 57.8% of the pharmacists in our study agreed that reporting adverse drug reactions was an essential role of all practising pharmacists. Comparable results have been reported in other research (12).

Pharmacists in our study mostly depended on drug information leaflets to update their knowledge on adverse drug reactions and on textbooks to a lesser extent. Only 14.2% used the internet as their primary source of information although reputable websites for drug-related information are available. Awareness needs to be raised among pharmacists about such websites and their usefulness for obtaining up-to-date information on drugs and adverse drug reactions.

Figure 1 Pharmacists' main source of information on adverse drug reactions, Tripoli, Libya

A main limitation of our study was that it was based on a self-reported questionnaire, so personal bias may have affected the results.

Although the knowledge of pharmacists about adverse drug reactions and pharmacovigilance is limited, most of the participants believed that reporting adverse drug reactions was crucial to ensure patient safety and health. Regulators, policy-makers and health

care professionals need to reinforce the importance of reporting adverse drug reactions, and pharmacovigilance policies are required in the Libyan health care system. In the first instance, educational and training programmes should be introduced for practising pharmacists to increase their knowledge of and improve attitude toward pharmacovigilance and reporting of adverse drug reactions.

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Competing interests: None declared.

Connaissances, attitudes et pratiques des pharmaciens en matière de pharmacovigilance en Libye

Résumé

Contexte : Le concept de pharmacovigilance n'est pas bien connu en Libye et sa pratique en est encore aux premiers stades.

Objectifs : La présente étude visait à déterminer les connaissances, les attitudes et les pratiques des pharmaciens à Tripoli (Libye) en matière de pharmacovigilance et de notification des effets indésirables des médicaments.

Méthodes : Une étude transversale a été menée entre octobre 2019 et février 2020 auprès de pharmaciens en activité sélectionnés de manière aléatoire dans des pharmacies de Tripoli. Les participants remplissaient les conditions pour être inclus dans l'étude s'ils possédaient un diplôme en pharmacie d'une université ou d'un institut reconnu(e). Les données ont été recueillies au moyen d'auto-questionnaires validés.

Résultats : Sur 500 pharmaciens sélectionnés, 408 ont répondu au questionnaire. Globalement, les pharmaciens connaissaient mal la pharmacovigilance et les notifications d'effets indésirables des médicaments : seuls 28,9 % définissaient correctement la pharmacovigilance et 14,7 % connaissaient l'existence d'un centre de pharmacovigilance en Libye. Les attitudes des pharmaciens vis-à-vis de la pharmacovigilance étaient positives : ils étaient 77,2 % à penser qu'il fallait inclure la pharmacovigilance dans le programme de formation en pharmacie et 73,0 % à affirmer qu'ils exerceraient cette pratique s'ils étaient formés. Les pharmaciens dépendaient principalement des feuillets d'information sur les médicaments pour mettre à jour leurs connaissances sur les effets indésirables des médicaments.

Conclusion : En raison du faible niveau de connaissances des pharmaciens en matière de pharmacovigilance et de leur volonté de s'impliquer s'ils sont formés, des programmes de formation devraient être mis en place pour les pharmaciens en exercice afin d'améliorer leurs connaissances et d'encourager leur participation active à la pharmacovigilance. Les responsables de la réglementation doivent insister sur l'importance de notifier les effets indésirables des médicaments et mettre en œuvre des politiques de pharmacovigilance dans le système libyen de soins de santé.

معلومات الصيدالة واتجاهاتهم وممارساتهم بشأن التيقظ الدوائي، ليبيا

أحمد عطية، أمل بوتو، صفية العربي

الخلاصة

الخلفية: مفهوم التيقظ الدوائي غير معروف جيداً في ليبيا، ولا تزال ممارسته في مراحلها الأولى.

الأهداف: هدفت هذه الدراسة إلى تحديد معلومات الصيدالة واتجاهاتهم وممارساتهم في طرابلس، ليبيا، بشأن التيقظ الدوائي والإبلاغ عن التفاعلات الدوائية الضارة.

طرق البحث: أجريت دراسة مقطعية في الفترة من أكتوبر/ تشرين الأول 2019 إلى فبراير/ شباط 2020 للصيدالة العاملين الذين اختبروا عشوائياً من الصيدليات في طرابلس. وكان المشاركون مؤهلين للإدراج إذا كانوا يحملون شهادة أو دبلوماً في الصيدلة من جامعة أو معهد معترف به. وُجعت البيانات من خلال استبيان مُتَّبَع من صحته يملؤه المستجيبون بأنفسهم.

النتائج: أكمل 408 صيادلة، من بين 500 صيدلي تم اختيارهم، الاستبيان. وكانت معلومات الصيدالة بالتيقظ الدوائي والإبلاغ عن التفاعلات الدوائية الضارة ضعيفين بوجه عام: حيث حدد 28.9٪ فقط التيقظ الدوائي على نحو صحيح، بينما كان 14.7٪ على علم بوجود مركز للتيقظ الدوائي في ليبيا. وكانت مواقف الصيدالة تجاه التيقظ الدوائي إيجابية: حيث أعرب 77.2٪ عن اعتقادهم بضرورة إدراج التيقظ الدوائي في المنهج الدراسي الخاص بالصيدلة، وقال 73.0٪ إنهم سوف يمارسون التيقظ الدوائي في حالة تدريبهم عليه. ويعتمد الصيدالة في الغالب على نشرات المعلومات الدوائية لتحديث معرفتهم بالتفاعلات الدوائية الضارة.

الاستنتاج: نظرًا لانخفاض مستوى معرفة الصيدالة بالتيقظ الدوائي، واستعدادهم للمشاركة إذا تلقوا تدريبًا، ينبغي إدخال برامج تدريبية للصيدالة الممارسين لتحسين معلوماتهم وتشجيع مشاركتهم الفعالة في التيقظ الدوائي. ويجب على الجهات التنظيمية تعزيز أهمية الإبلاغ عن التفاعلات الدوائية الضارة وتنفيذ سياسات التيقظ الدوائي في نظام الرعاية الصحية في ليبيا.

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Intersectionality of gender in recruitment and retention of the health workforce in Africa: a rapid review

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Abstract

Background: Despite the importance of gender and intersectionality in policy-making for human resources for health, these issues have not been given adequate consideration in health workforce recruitment and retention in Africa.

Aims: The objective of this review was to show how gender intersects with other sociocultural determinants of health to create different experiences of marginalization and/or privilege in the recruitment and retention of human resources for health in Africa.

Methods: This was rapid review of studies that investigated the intersectionality of gender in relation to recruitment and retention of health workers in Africa. A PubMed search was undertaken in April 2020 to identify eligible studies. Search terms used included: gender, employment, health workers, health workforce, recruitment and retention. Criteria for inclusion of studies were: primary research; related to the role of gender and intersectionality in recruitment and retention of the health workforce; conducted in Africa; quantitative or qualitative study design; and published in English.

Results: Of 193 publications found, nine fulfilled the study inclusion criteria and were selected. Feminization of the nursing and midwifery profession results in difficulties in recruiting and deploying female health workers. Male domination of management positions was reported. Gender power relationship in the recruitment and retention of the health workforce is shaped by marriage and cultural norms. Occupational segregation, sexual harassment and discrimination against female health workers were reported.

Conclusion: This review highlights the importance of considering gender analysis in the development of policies and programmes for human resources for health in Africa.

Key words: Gender, health workforce, employment, personnel selection, Africa

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Introduction

According to the recent world health statistics report (1), Africa is still one of the continents with the highest burden of disease. Most countries in Africa have very weak health systems and poor-quality health care, which, to a large extent, may be attributed to critical shortages in human resources for health (2). In the 2006 world health report, Africa was classified as having the most severe health workforce shortage in the world; of the 57 countries considered to be facing a health workforce crisis (health workforce density ratio lower than 2.3 health workers per 1000 population), 36 were in Africa (3).

The World Health Organization (WHO) noted that efforts in Africa to ensure adequate human resources for health are constrained by inadequate institutional capacity for human resources management, inadequate numbers of health workers, slow progress in educational reforms, skewed distribution of health workers, lack of incentives, ineffective retention strategies for health workers and, most importantly, gender inequality (2). Experts in human resources for health have noted that gender inequality and imbalance are a major challenge to

delivery of health care services in low-income settings (4). According to Newman, “gender inequalities are systems inefficiencies that contribute to clogged health worker educational pipelines, recruitment bottlenecks, attrition, and worker maldistribution in formal and non-formal health workforces” (5). It has been argued that the failure in policy and planning for human resources can be traced to health managers disregard for gender (6).

A recent study in parts of Africa on the gendered health workforce observed that in Africa, difficulties in recruitment are often made more severe because of a history of low, irregular salaries for health professionals, poor staff mix and unbalanced gender mix (7). The study also noted that “retention is also problematic, with internal (across sectors) and external brain-drain as a result of poor and irregular remuneration, poor HR management practices and limited promotion opportunities, alongside poor working conditions, especially in rural areas” (7). In Africa where human resources for health and other health system components are highly influenced by context-specific factors, especially social and cultural determinants of health, gender as a sociocultural factor

therefore plays a critical role in recruitment and retention of health workers (2,8,9).

Despite the importance of gender and intersectionality in policy-making for human resources for health, these have not been given adequate consideration in matters related to health workforce recruitment and retention in Africa. In this paper, intersectionality is understood as the concept that brings in an additional series of characteristics and contexts that intersect with gender in dynamic ways to disadvantage or privilege different individuals creating inequities (10,11). Bowle, further defined intersectionality as a “theoretical framework that posits that multiple social categories (e.g., race, ethnicity, gender, sexual orientation, socioeconomic status) intersect at the micro level of individual experience to reflect multiple interlocking systems of privilege and oppression at the macro, social-structural level (e.g., racism, sexism, heterosexism)” (12). Although consensus on the concept and definition of intersectionality is lacking, it is increasingly recognized by researchers on human resources for health as an important theoretical approach that provides a framework for understanding inequalities within the health systems and particularly those associated with recruitment and retention of the health workforce by highlighting intersections of individuals’ multiple identities within social systems of power that determine the placement and position of health workers (11,13).

Gender is undoubtedly one of the main identities of an individual which influence human resources for health in most low- and middle-income countries. Gender has been described as a social and political construct that is instilled in personal actions and organizational structures, practices and processes such that it affects a person’s professional development and career advancement (14). This explains why deeper exploration of gender and intersectionality in human resources for health is gaining momentum worldwide because there are many unanswered questions about the subject. For instance, it is estimated that up to 75% of health workers are female but this gender ratio is not reflected in certain categories of the health workforce, including the top levels of leadership in many low- and middle-income countries (15). Consequently, calls have been made to take into account the ways in which gender intersects with other social identities and stratifying factors to create unique experiences of marginalization and disadvantage (15). How gender and intersectionality define recruitment and retention of health workforce in Africa is yet to be fully explored.

The objective of this review is to show how gender intersects with other sociocultural determinants of health, including age, race, class, (dis)ability, education, professional hierarchy, economic security, residence, marital status, patriarchy and work grouping, to create different experiences of marginalisation and/or privilege in the recruitment and retention of health workers in Africa. Through this review we aim to propose recommendations to policy-makers to address

the challenges to the health workforce caused by intersectionality of gender.

Methods

We undertook a rapid review, which accelerates and streamlines the conventional systematic review processes in order to provide policy-makers with timely evidence for policy formulation (16). We searched PubMed in March 2020 to identify studies published in English from 1966 to 2020 that investigated the intersectionality of gender in relation to recruitment and retention of health workers in Africa. We used mainly the PubMed database for extraction of relevant publications because studies indexed in PubMed are regarded to be reliable as they underwent undergone a reasonable peer review process.

We retrieved 193 publications using the following key words. Category 1) gender, employment, health workers, Africa – 167 publications; Category 2) gender, health workforce, recruitment, Africa – 9 publications; and Category 3: gender, health workforce, retention, Africa – 17 publications. The criteria for inclusion of studies were: primary research, not review articles; related to the role of gender and intersectionality in recruitment and retention of the health workforce; conducted in Africa; and quantitative or qualitative study design. Studies not published in English were excluded.

The first author independently searched and retrieved relevant publications, by screening titles of publications and the abstracts, and retrieving full texts of publications that fulfilled the inclusion criteria. The second author independently verified the publications and checked for their completeness and accuracy. Differences were resolved through discussion and consensus.

Results

Of the 193 publications found, nine (5%) met the inclusion criteria: six of 167 studies in category 1, one of nine publications in category 2, and three of 17 publications in category 3 (however, one in category 3 was duplicated and so was excluded). Of the nine studies included, six were qualitative studies, two used a mixed method design and one was a cross-sectional survey. Three of the studies were conducted in South Africa, one was a multicountry study (Cambodia, Sierra Leone, Uganda and Zimbabwe), and the others were carried out in Ethiopia, Kenya, Malawi, Niger and United Republic of Tanzania. The results are shown in Table 1.

Intersections of gender in recruitment

Two studies reported on the intersection of gender in recruitment of health workers. In one of the studies, feminization of the nursing profession was documented to result in difficulties in recruiting and deploying female health workers in rural zones (17). The second study reported that the issue of gender was absent in the policy on lay health workers and that policy developers were not

Table 1 Profile of selected studies that investigated intersectionality of gender in recruitment and retention of the health workforce in Africa

Authors/year	Location	Objective	Design	Target population	Key findings	Intersection
Witter et al. (2017) (7)	Uganda, Sierra Leone, Zimbabwe	To explore how gender relations affect human resources for health in post-conflict and fragile settings	Mixed methods: stakeholder mapping, document reviews, key informant interviews	human resources for health stakeholders	Patterns of employment: women predominate in nursing and midwifery units, are under-represented in management positions and are clustered in lower paying positions.	Poverty Household structure (married versus female headed) Rural residence
Belaid et al. (2017) (17)	Niger	To understand the factors influencing the retention of health professionals in rural areas	In-depth interviews, documentary analysis, concept mapping	Policy-makers, health professionals, health managers	Feminization of the nursing profession led to difficulties in recruitment and deployment. Local cultural norms dictate that women should follow their husbands, and not vice versa.	Marital status Women's mobility Feminization
Daniels et al. (2013) (18)	South Africa	To explore policy development processes for lay health workers in relation to gender issues	Qualitative in-depth interviews	Policy actors	All of the informants agreed that lay health workers were mostly women. Gender issues were absent in the policy. High unemployment rates meant there were women available to fill a gap in the health system without demanding high salaries.	Non-inclusion in policy documents, broader social context of patriarchy Unemployment
Shung-King et al. (2018) (19)	South Africa	To examine the influence of gender on career progression and leadership	Qualitative in-depth interviews, life and career history and critical incident analysis	Senior managers in the health ministry	Race strongly intersected with gender; professional hierarchy further compounded the influence of gender and race; males advanced more rapidly into management and senior management positions than female counterparts.	Race (black) Professional hierarchy Male managers in predominantly female departments
Newman et al. (2011) (20)	Kenya	To advance equal opportunity, and improve performance irrespective of gender	Qualitative interviews	Health workers	Occupational segregation, sexual harassment and discrimination based on pregnancy and family responsibilities present problems, especially for female students and faculty	Female gender impacts negatively on health provider education
Hull 2010 (21)	South Africa	To explore multiple factors that might influence nurses' decisions to migrate	Interviews	Health professionals	Fixed representations of gender roles play an important part in nurses' own commentary on migration.	Domestic responsibilities: are gendered and limit migration of female nurses Household income
Chirwa & Elhers (2005) (22)	Malawi	To assess gender issues in management promotions in Malawi's health services	Descriptive cross-sectional	Middle and top health care managers	Females were under-represented at middle and top management levels; but over-represented at lower (operational) management levels.	Work cadre
Kolstad (2011) (23)	United Republic of Tanzania	To understand the preference structure of Tanzanian clinical officers	Discrete choice experiments	Clinical officers	Women were less responsive to financial incentives. Women were more concerned with infrastructure and the resource situation.	Salary increment Infrastructure Educational opportunities Rural location
Gesese et al. (2015) (24)	Ethiopia	To assess health workforce acquisition, retention and turnover	Cross-sectional-checklist, in-depth interviews	Health workers	Males were nearly two times more likely to intend to leave for a better job or working conditions than females.	Male gender reduces health worker retention

aware of gender-based problems associated with working conditions. The high unemployment rates meant women were available to fill a gap in the health system without being in a position to demand higher salaries. The social context of patriarchy also intersected with gender to affect recruitment and employment of female health workers (18).

Intersections of gender in retention

Eight studies described the effect of gender on the retention of health workers. In one of the studies, being black and the professional hierarchy within the system limited professional development (retention) of women. In addition, there were more male managers in predominantly female departments (19). Female gender was reported to have a negative effect on health provider education by one of the studies. Occupational segregation, sexual harassment and discrimination based on pregnancy and family responsibilities were problems faced by female students and faculty members in this study (20). In another study, women predominated in nursing and midwifery units but were under-represented in management positions and were clustered in lower paying positions. Gendered power relations shaped by women's household responsibilities negatively affected rural deployment of female health workers largely because of patriarchal dominance. Furthermore, women in all contexts face challenges in accessing both pre- and inservice training (7). Similarly, findings from another study showed that for married women local cultural norms dictate that women follow their husbands and not vice versa, hence affecting retention in rural areas (17).

Other studies highlighted gender as a fixed representation (main determining factor) on migration of nurses in search of better work opportunities. Female nurses were more likely to migrate than their male counterparts (21). Females were under-represented at middle and top management levels but over-represented at lower (operational) management levels (22). In exploring ways to achieve retention in rural areas, another study found that women tended to be significantly less responsive to financial incentives than men (23). In another study, males were nearly twice as likely to intend to leave for a better job or working conditions than females – i.e. less likely to be retained (odds ratio = 1.6; 95% confidence interval: 1.0–2.5) (24).

Discussion

The outcome of this review confirms the findings of previous reports which showed that gender and intersectionality are important social stratifying factors that intersect in dynamic and interactive ways to influence the health systems in general and human resources for health more specifically (8,12,25). All the studies reviewed showed the strong influence of gender on the recruitment and retention of the health workforce in Africa. Thus, gender analysis can be used to explain the documented inequalities between male and female health workers and variations in how the health workforce is

recognized, valued and supported. Differences exist at the professional level (career trajectories, pay, training and other technical resources and professional networks) and at the personal level (personal safety, stress, autonomy, self-esteem, family and other social relationships) (26–28).

One important finding in our review is the feminization of certain categories of health professions. Feminization of the nursing and midwifery profession was shown to result in difficulties in recruiting, deploying and maintaining female health workers, especially in rural areas (17). Zurn and colleagues observed that the distribution of women by occupational category is biased in favour of nursing and that women are very poorly represented in other categories, such as dentistry, medical assistant jobs, pharmacy, managerial/training jobs and medicine (4).

The predominance of females in the nursing profession is common worldwide because nursing is often labelled as the work of women. A number of previous reports have shown the very strong link between female gender and nursing and described it to be associated with the feminine nature of nurturing, caring, empathy and gentleness as opposed to masculine characteristics (29–31). According to a study in Mauritius, nursing is associated with relatively low status owing to gender and income, and is also influenced by cultural perceptions of social status, the nature of the work and sexuality (32). In Africa, where cultural perceptions of social status favour patriarchal dominance, it is not a surprise that nursing is a female-dominated occupation. In fact, men who choose to go into nursing are often portrayed as not “real” men, effeminate, homosexuals, somewhat suspicious and out to seek to benefit from some hidden advantages (29,30,33). Because the nursing profession is gender segregated and influenced by cultural traditions which promote male dominance, male nurses are often treated in a special way and given privileged positions in the health care settings (32).

Our review also indicates male dominance in leadership and management positions in the health workforce (18,19,22). Available statistics indicate that women make up more than 70% of the health care workforce and are the largest users of health care, yet they remain very under-represented in top management and executive leadership positions (4). A recent study noted that women's role as child bearers and gendered societal expectations, including child nurturing and other domestic responsibilities, can influence their ability to take up leadership opportunities, and their selection and appointment as leaders (35). In another study, prejudicial cultural values and gendered social roles and expectations were found to hinder the career advancement of women in health care (36).

A number of studies have shown that stereotypical male and female attributes and behaviours have led to men and women largely preferring male leaders, even when the credentials of male and female candidates are the same (37,38). It has been argued that stereotypical

female attributes, such as cooperation, modesty and emotiveness, tend to be perceived as incompatible with strong leadership, whereas stereotypical male attributes, such as assertiveness, stability, achievement orientation and independence, tend to be viewed as fundamental to leadership (39). Furthermore, women sometimes lack the desire to hold a managerial position, given that they are more committed to their families, child care and matrimonial responsibilities than to their careers, compared with their male counterparts (40).

The under-representation of women in managerial and decision-making positions may lead to less attention being given to and a poorer understanding of the problems specific to women (41). In the WHO report on gender mainstreaming for health managers, it was noted that addressing gender equality in the workplace requires more than ensuring that women and men can participate at different levels of the organization (42). It also requires ensuring that, once women are recruited and hired, they receive equitable treatment and opportunities to perform their duties to the best of their ability (42). WHO is supporting a joint inter-agency health workforce expansion and transformation programme which has gender as a core principle and seeks to use workforce plans, investments and actions to seize the opportunities to realize the dividend from providing equal opportunities to all irrespective of gender (34).

In one of the studies reviewed, it was observed that gender power relationship in the recruitment and retention of health workers is shaped by marriage (21) and cultural norms that dictate that women follow husbands and not vice-versa (17). In a study on physician retention rate and its effective factors in the Islamic Republic of Iran, it was noted that at the individual level, gender is not a primary factor in retention while marital status was, i.e. married physicians showed greater willingness to stay in their area of origin (43). Another study reported the influence of gender on career trajectories, in particular gender roles within dual-career households, with some female professionals prioritizing their male partners' careers ahead of their own (19). There is sufficient evidence that shows that it is common for women health care professionals to prioritize family demands over their careers (44,45). In Africa, where sociocultural determinants of health are very pronounced, the intersection of gender will continue to exert a strong influence on the health systems. According to WHO, addressing gender norms, roles and relations enables better understanding of how sociocultural identity construction (male and female), attribution of rights and unequal power relations can affect components of the health system, including the health workforce (46).

The attempt to meet family and other social demands has led many female health workers to reject or forfeit well paid job offers or transfers to locations where their families do not live, some even opting to remain unemployed. In one of the studies we reviewed, a high rate of unemployment among female health professionals meant they were available to fill gaps without being able

to ask for higher salaries (18). In a previous report of gender analysis by the WHO Commission on the Social Determinants of Health, it was noted that not only are women over-represented in caring, informal, part-time, unskilled and unpaid work, and work that is routinely not measured, but women's contributions also cover a range of activities that blur some of these conventional distinctions (26). It is widely recognized that women's lower status is often institutionalized through social, economic and political structures of the society with institutions being more inclined to marginalization of women in employment, promotion and leadership or managerial positions (46). There is need to strengthen mechanisms and initiate policies that will address the broader sociopolitical factors, power dynamics and cultural factors that are responsible for gender discrimination in recruitment and retention in the health workforce.

An important finding of one of the studies reviewed is the occupational segregation, sexual harassment, violence and discrimination against the female health workers based on certain social demands, such as family responsibility and pregnancy (20). It is reported that in Saudi Arabia, women in the medical field can achieve good success at junior levels but are exposed to some degree of discrimination at higher levels (47). In addition, because of contact with male medical staff and patients and night shifts, employment for women in the medical field is not always welcomed.

Occupational segregation and sorting of men and women into specific types of job are key contributing factors to inequality in pay with women more concentrated in low-grade and low-paying jobs, the public sector and part-time employment (48–50). In addition to discrimination against female health workers, other factors that contribute to this gender pay gap include women's dual roles in the workplace and family. For instance, a larger proportion of female health workers are likely to take parental leave than their male counterparts. Furthermore, the lack of facilities for child care in health care settings forces more women out of work than men (48,49). Previous reports on gender and human resources for health have shown that gender discrimination and inequality are key barriers to entry, reentry and retention in employment systems, especially for female health workers (5,26,51).

Women are reported to face a disproportionate burden of violence and discrimination across all sectors, but the female-dominated occupations such as health and social care services are at greater risk (52,53). A gender analysis of the health workforce also revealed significant levels of violence experienced by women health workers who are disproportionately victimized because of gendered ideologies that subjectively sanction such violence or because of their disadvantaged position within the health workforce (26). In Afghanistan, it was reported that increased insecurity in remote areas affects the mobility of health professionals, especially females (54). In order to increase the retention of female health workers in

rural and remote areas, Afghanistan started to provide opportunities for male family members and spouses to deploy to the same health facilities (54).

According to WHO, female health workers face harassment and violence from three sources – male colleagues, male patients and the wider community, including visitors to facilities or men in the community if they are outreach workers (55). In addition, the stigma in reporting cases in the health profession has created a misperception that harassment cases are rare (55). In a quantitative review of workplace violence among more than 150 000 nurses mostly females, overall violence exposure rates were 36.4% for physical violence, 66.9% for nonphysical violence, 39.7% for bullying and 25.0% for sexual harassment, with 32.7% of nurses reporting having been physically injured in an assault (56).

In Rwanda, it was reported that about 39% of health workers faced at least one form of workplace violence, such as verbal abuse, bullying and sexual harassment, in the 12 months before the study, with female health workers being disproportionately affected (57). Furthermore, women health and social care workers working in conflict-affected regions or remote settings are highly vulnerable to violence and sexual harassment (7). To address sexual harassment and discrimination, it has been suggested that policies and mechanisms be established that promote equal opportunity, non-discrimination, gender equality and respect for human rights, all of which should be core health professional values and competencies (15).

In conclusion, our review highlights the importance of considering gender analysis in the development of policies and programmes for human resources for health

in Africa. There are however a number of limitations to this study. First, some of the studies/papers included are old and so the situation may have changed. Second, we limited our search to the PubMed, and so some studies indexed in other important databases may have been missed. Third, only studies published in English were included and thus some relevant studies in French, Portuguese and Arabic, could not be assessed. In spite of these limitations, the study highlights some vital issues needed to address intersectionality of gender in African setting. WHO identified the main urgent challenges to human resources for health in Africa including: weak leadership and governance capacity for human resources for health; weak training capacity; inadequate utilization, retention and performance of available health workers; insufficient information and evidence on gender intersectionality; weak regulatory capacity; uncoordinated partnerships; and weak policy dialogue (2). To improve human resources for health in Africa, it is imperative for policy-makers to develop affirmative action policies for gender equality. A number of recommendations which can help develop such policies include: (i) commissioning more studies on intersectionality of gender in human resources for health to provide local context-specific evidence for policy-making; (ii) engaging stakeholders and convening a citizens' panel to deliberate on how to address some of the key issues, such as social, cultural, economic and patriarchal factors, that influence intersectionality of gender in human resources for health; and (iii) applying gender sensitivity and gender equity in policy development on human resources for health.

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Intersectionnalité des questions de parité homme-femme en matière de recrutement et de fidélisation des personnels de santé en Afrique : une analyse rapide

Résumé

Contexte : Malgré l'importance des questions de parité homme-femme et de l'intersectionnalité dans l'élaboration de politiques liées aux ressources humaines dans le domaine de la santé, ces aspects n'ont pas été dûment pris en compte dans le recrutement et la fidélisation des personnels de santé en Afrique.

Objectifs : L'objectif de la présente analyse était de montrer comment les questions de parité homme-femme se recoupent avec d'autres déterminants socioculturels de la santé pour créer des expériences différentes eu égard à la marginalisation et/ou au privilège dans le processus de recrutement ou de fidélisation des ressources humaines dans le domaine de la santé en Afrique.

Méthodes : Il s'agit d'une analyse rapide des études qui ont examiné l'intersectionnalité des questions de parité homme-femme en relation avec le recrutement et la fidélisation des personnels de santé en Afrique. Une recherche dans PubMed a été effectuée en avril 2020 pour identifier les études éligibles. Les termes de recherche utilisés comprenaient : questions de parité homme-femme, emploi, agents de santé, personnels de santé, recrutement, fidélisation. Les critères d'inclusion des études étaient les suivants : recherche primaire ; liée au rôle des questions de parité homme-femme et de l'intersectionnalité dans le recrutement et la fidélisation du personnel de santé ; menée en Afrique ; plan d'étude quantitative ou qualitative ; et publiée en anglais.

Résultats : Sur les 193 publications trouvées, neuf répondaient aux critères d'inclusion de l'étude et ont été sélectionnées. La féminisation de la profession infirmière et obstétricale entraîne des difficultés en matière de recrutement et de déploiement des personnels de santé féminins. Une dominance masculine des postes

d'encadrement a été rapportée. La relation de pouvoir entre les hommes et les femmes dans le recrutement et la fidélisation des personnels de santé est déterminée par le mariage et les normes culturelles. La ségrégation professionnelle, le harcèlement sexuel et la discrimination à l'égard des agents de santé féminins ont été signalés.

Conclusion: La présente étude souligne l'importance de la prise en considération de l'analyse des questions de parité homme-femme dans l'élaboration des politiques et des programmes relatifs aux ressources humaines dans le domaine de la santé en Afrique.

التداخل القائم على نوع الجنس في توظيف القوى العاملة الصحية واستبقائها في أفريقيا: استعراض سريع

شيجوزي أونيكسي، بيليكييس أونيكسي

الخلاصة

الخلفية: على الرغم من أهمية نوع الجنس والتداخل في رسم السياسات المعنية بالموارد البشرية الصحية، لم تحظ هذه المسائل بالاهتمام الكافي في توظيف القوى العاملة الصحية واستبقائها في أفريقيا.

الأهداف: هدف هذا الاستعراض إلى بيان كيفية تداخل نوع الجنس مع المحددات الاجتماعية الثقافية الأخرى للصحة، لتوضيح تجارب مختلفة من التهميش و/أو الامتياز في توظيف الموارد البشرية الصحية واستبقائها في أفريقيا.

طرق البحث: كان هذا استعراضاً سريعاً لدراسات بحثت في التداخل القائم على نوع الجنس من حيث توظيف العاملين الصحيين واستبقائهم في أفريقيا. وأجري بحث على موقع PubMed في أبريل/نيسان 2020 لتحديد الدراسات المؤهلة. وشملت مصطلحات البحث المستخدمة: نوع الجنس، والعالة، والعاملين الصحيين، والقوى العاملة الصحية، والتوظيف والاستبقاء. وشملت معايير إدراج الدراسات: البحوث الأولية؛ والعلاقة بدور نوع الجنس والتداخل في توظيف القوى العاملة الصحية واستبقائها؛ والبحوث التي أجريت في أفريقيا؛ والتصميم الكمي أو النوعي للدراسات؛ والدراسات المنشورة باللغة الإنجليزية.

النتائج: من بين 193 منشوراً، وُجد أن تسعة منها استوفت معايير إدراج الدراسات وتم تحديدها. ويؤدي تأنيث مهنة التمريض والقبالة إلى صعوبات في توظيف العاملات الصحيات ونشرهن. وأبلغ عن سيطرة الذكور على المناصب الإدارية. وتتحدد علاقة نوع الجنس بالسلطة في توظيف القوى العاملة الصحية واستبقائها بالزواج والمعايير الثقافية. وأبلغ عن التفرقة المهنية والتحرش الجنسي والتمييز ضد العاملات الصحيات. الاستنتاج: يسلط هذا الاستعراض الضوء على أهمية النظر في التحليل الجنساني عند وضع السياسات والبرامج المتعلقة بالموارد البشرية الصحية في أفريقيا.

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Out-of-hospital cardiac arrest in countries of the Gulf Cooperation Council: a scoping review

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Abstract

Background: Published data are lacking on response to and outcomes of out-of-hospital cardiac arrest in the Middle East. What data there are have not been comprehensively analysed.

Aims: This study aimed to assess the characteristics of people with out-of-hospital cardiac arrest in Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) and the response to and outcomes of such incidents.

Methods: This was a scoping review of published and grey literature on out-of-hospital cardiac arrest in GCC countries from 1990 to June 2019. Studies in English and Arabic were eligible for inclusion. MEDLINE, CINAHL, Web of Science and EMBASE were searched as well as relevant non-indexed journals. Google searches were also done. References of included studies were scanned for relevant articles. Experts on the subject in the region were consulted.

Results: Of 647 citations retrieved, 24 studies were included for data extraction and analysis. No literature was identified for Bahrain. People with out-of-hospital cardiac arrest in the region were younger, predominantly male and had more comorbidity than reported in other regions of the world. Use of emergency medical services was low across the GCC countries, as was bystander cardiopulmonary resuscitation, return of spontaneous circulation and survival to discharge.

Conclusions: A coordinated effort to address out-of-hospital cardiac arrest, including the generation of research, is lacking within and among GCC countries. Establishment of lead agencies responsible for developing and coordinating strategies to address out-of-hospital cardiac arrest, such as community response, public education and reporting databases, is recommended.

Key words: out-of-hospital cardiac arrest, emergency medical services, cardiopulmonary resuscitation, Gulf Cooperation Council, Middle East

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Introduction

Out-of-hospital cardiac arrest is a major cause of mortality worldwide, with variable survival reported across countries and systems. In particular, Middle-Eastern and South Asian countries report low survival rates (1). Reported reasons for low survival from out-of-hospital cardiac arrest in these settings include unique demographic, cultural and logistical challenges related to the management of out-of-hospital cardiac arrest. At the same time, most of the evidence used to inform resuscitation guidelines for out-of-hospital cardiac arrest comes, for the most part, from very different systems, and applying this evidence and guidelines in Middle-Eastern settings may also present a challenge.

Characteristics and outcomes of out-of-hospital cardiac arrest in Middle-Eastern countries are still poorly researched, thus compounding these challenges. The resulting lack of knowledge prevents us from understanding the factors related to out-of-hospital

cardiac arrest, and thereby prevents us from improving response to and outcomes of out-of-hospital cardiac arrest in these countries. Thus, to meaningfully tackle out-of-hospital cardiac arrest in the Middle East, we first need to understand the issue within this context.

The Gulf Cooperation Council (GCC) was established in 1981 and comprises the governments of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. The countries in the GCC are predominantly Islamic and they share a common cultural and historical background (2). Another shared trait is their economic reliance on expatriate workforces (3), estimated at 48% of the total regional population of 53 million (4,5). Within this regional population, life expectancy has risen substantially from 42–61 years in the 1960s to 74–80 years in 2018 (5). However, increased population numbers, the health care needs of groups with different demographics and increased life expectancy have led to a rise in health care demand. This rise is predominantly due to high rates of noncommunicable diseases such as

diabetes, cardiovascular disease and obesity, attributable to unhealthy lifestyles and a general lack of coordinated public health programmes (4,6). In order to reduce the risk of mortality associated with such morbidity, most GCC member countries have initiated public health strategies, which include the recording and reporting of noncommunicable diseases.

The first report on out-of-hospital emergency care in a GCC country was for Abu Dhabi in 2004 (7), when emergency medicine within GCC countries was rudimentary. This study observed no real medical oversight of out-of-hospital care provision, no treatment policies, a lack of training and education, and no quality assurance policies. However, emergency medicine and prehospital care have developed across the GCC countries in the past 15 years.

Reporting of out-of-hospital cardiac arrest rates, response and outcomes are benchmarks of emergency medical response readiness. Therefore, we conducted a review of studies on out-of-hospital cardiac arrest in the GCC to understand their characteristics and properties, and to identify any gaps in the literature and areas for further research.

Methods

Study design

We conducted a scoping review, which enabled us to identify, map and present an overview of a heterogeneous body of literature (8,9). We considered a scoping review to be appropriate given the predicted lack of published data (and potential reliance on sources from the grey literature), the anticipated heterogeneity among studies and the expected variability in reporting.

Review process

We performed a systematic literature search for studies that investigated out-of-hospital cardiac arrest in the GCC region. We used a five-stage framework (8), which included: (i) identifying the research question; (ii) identifying relevant studies; (iii) refining the study selection criteria; (iv) collecting relevant data from each article; and (v) collating, summarizing, reporting and interpreting the results. We also implemented a recommended additional stage: (vi) consultation with experts. We reported our process according to the PRISMA extension for scoping reviews (10).

First, we identified three research questions.

1. What are the characteristics of cases of out-of-hospital cardiac arrest in the GCC region?
2. How do these studies differ from other international studies?
3. What insights can be gained from these findings in order to better inform policy and practice in the GCC region?

Second, to identify relevant studies we undertook a systematic search of the literature. An information

scientist (MA) developed the search strategy. We used this to search the electronic databases MEDLINE, CINAHL, Web of Science and EMBASE from 1990 until June 2019. The search strategy was modified accordingly for each database they do not all have the same subject headings. Relevant non-indexed journals were identified and searched, and we performed multiple Google web and Google Scholar searches. We searched the grey literature with guidance from the Grey Matters checklist (11). References of included studies were scanned for relevant articles. See Appendix I for search terms and a list of non-indexed sources.

Third, we established the eligibility criteria. Studies in English and Arabic were eligible for inclusion if they reported out-of-hospital cardiac arrest in the GCC. We excluded studies that were not related to out-of-hospital cardiac arrest (e.g. in-hospital cardiac arrest), case reports, studies that reported only on out-of-hospital cardiac arrest caused by a trauma, studies that were related to cardiopulmonary resuscitation training and those not conducted in GCC countries.

We (AB and CL) reviewed titles and abstracts of studies retrieved in the search. We resolved disagreements through discussion until we reached consensus. Where disagreement remained or there was insufficient evidence to make a decision, we included the citation for full text review and subsequent decision.

Fourth, to support the full-text review, we developed a standardized data extraction form to organize information, confirm relevance and extract study characteristics (See Appendix II) (12). Two reviewers (AB and CL) abstracted general study characteristics such as authorship, year of publication, country, study design, sample size, outcomes measures and characteristics of out-of-hospital cardiac arrest. We compiled all data for analysis into a single spreadsheet in Microsoft Excel 2013.

Fifth, we summarized and synthesised the data. Because of variations in study designs, terminology used and reporting conventions, we needed to identify common areas for reporting summarized results. We selected a number of demographic, process and outcome measures that reflect key components of an effective response to and management of out-of-hospital cardiac arrest. We abstracted and reported the findings for each measure per study where possible, and we report on them under the headings of characteristics, process and outcomes measures.

In line with the scoping review framework, we did not conduct a critical appraisal (8).

Sixth, in addition to our own experience and expertise with out-of-hospital cardiac arrest in the region, we invited a number of experts on out-of-hospital cardiac arrest in the GCC to contribute additional material and unpublished studies. Two of these individuals subsequently joined the research team (DA and AA).

Ethical considerations

This was a scoping review of completed studies and hence no ethics approval was required.

Results

Search results and study selection

The search yielded 590 citations. We identified an additional 57 citations through searches of the grey literature and hand searching. After elimination of duplicates, we screened 284 citations at the title and abstract level. This led to the exclusion of 236 citations. After full-text review of 48 citations, we included 24 full-texts for data extraction and analysis (Figure 1). Not all are referenced (some were unpublished at the time, or duplicate reference to technical report) – the full citation for these are included in Appendix III. See Appendix III for details of adult out-of-hospital cardiac arrest studies, and Appendix IV for details of paediatric out-of-hospital cardiac arrest studies.

Characteristics of studies

The included studies were published between 1999 and 2019 (13–30). The studies were: 16 full-text articles (both published and unpublished manuscripts), three technical reports or theses, three conference abstracts, and two letters to the editor. Ten studies were from the United Arab Emirates), six from Qatar, four from Saudi Arabia, three from Kuwait, one from Oman and one for the region. We did not identify any literature from Bahrain despite consultation with an expert on the subject in the coun-

try. Of the 24 studies, 16 (13–27, plus unpublished studies given in Appendix III) described adult cases or all cases of out-of-hospital cardiac arrest. Four studies reported data on paediatric out-of-hospital cardiac arrest (13,28–30) and we report these separately in our results; one study is reported as both an adult and a paediatric study on out-of-hospital cardiac arrest (13). Where results were published in more than one source (for example a technical report and a peer-reviewed manuscript), we only abstracted the most complete version. See Appendix III for details the sources abstracted.

Adult cases

Characteristics

Adults who experienced out-of-hospital cardiac arrest in the GCC region were consistently young, predominantly male and often had underlying comorbidities, such as diabetes. Most cases of out-of-hospital cardiac arrest occurred at home (ranging from 54% to 85% of all cases of out-of-hospital cardiac arrest). Table 1 and Figure 2 give further characteristics (see Appendix III for details).

We found differences in the characteristics of people who experienced out-of-hospital cardiac arrest among ethnic groups in the region (e.g. Arab, South Asian and North African). For example, compared with GCC nationals with out-of-hospital cardiac arrest, South Asian and North African people with out-of-hospital cardiac arrest were more likely to smoke but had lower levels of comorbidities (17,22). Despite this finding, South Asian and North African people with out-of-hospital cardiac arrest were generally younger and accounted for a large percentage of the total number of cases of out-of-hospital

Figure 1 Flow chart of search results

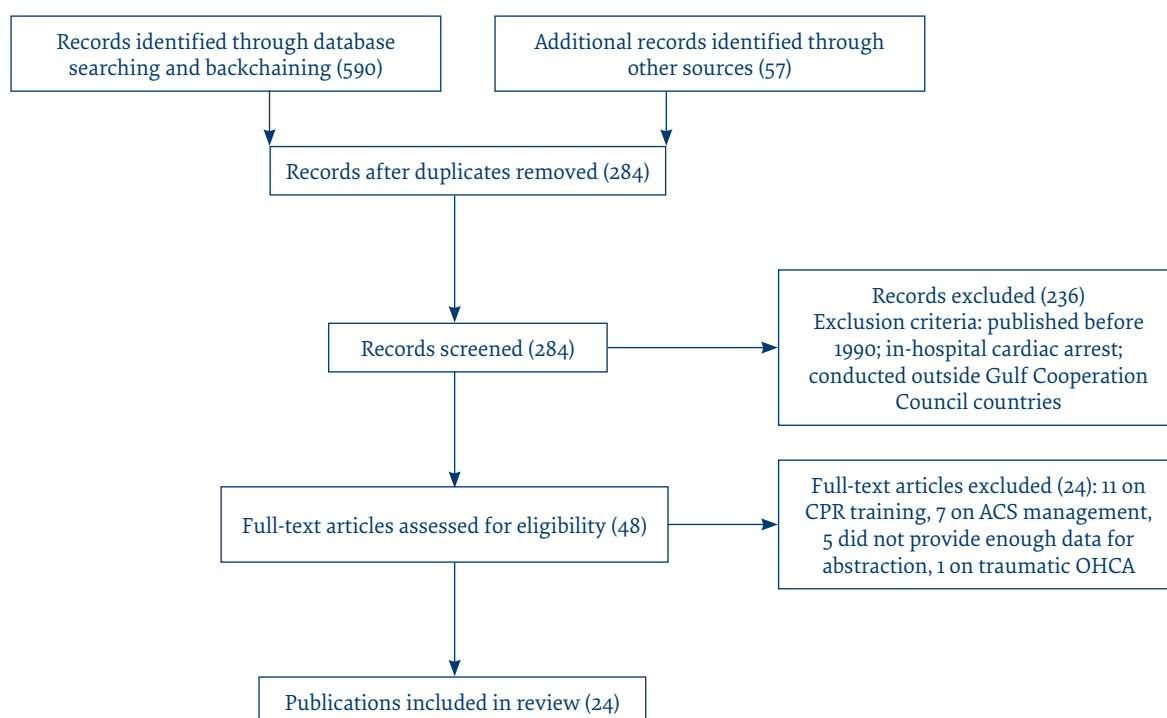


Table 1 Characteristics of the sample, and process and outcome measures for out-of-hospital cardiac arrest in Gulf Cooperation Council countries reported in the selected studies

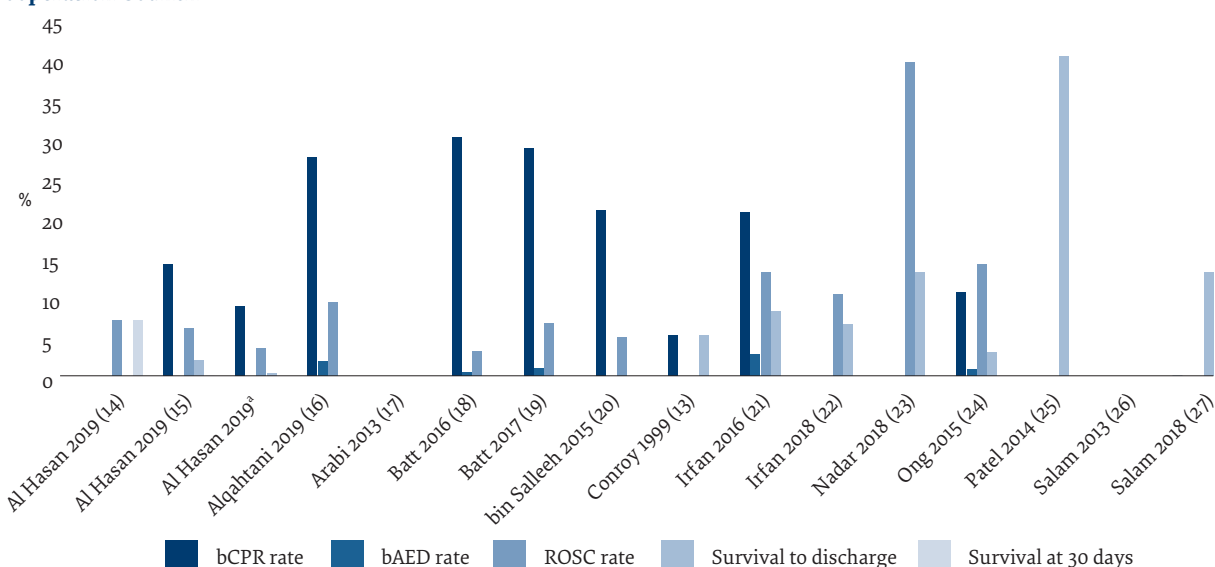
Study	Country	No. in sample	Characteristics				Process measures			Outcome measures		
			Median age, years	Mean age, years	Males, %	Females, %	Cardiac arrest at home, %	Bystander CPR, %	Bystander AED, %	ROSC, %	Survival to discharge, %	Survival at 30 days, %
Adult cases												
Al Hasan, 2019 (14)	Kuwait	314	-	54.7 (GP); 61 (EMS)	70 (GP); 67 (EMS)	30 (GP); 33 (EMS)	-	-	-	7 (GP); 3 (EMS)	-	7 (GP); 1 (EMS)
Al Hasan, 2019 (15) ^a	Kuwait	332	-	59 (pre); 63 (post)	74 (pre); 61.7 (post)	26 (pre); 38.3 (post)	75 (pre); 84.7 (post)	14 (pre); 12 (post)	-	6 (pre); 1.6 (post)	2 (pre); 0.8 (post)	0 (pre); 0.8 (post)
Al Hasan, 2019 ^b	Kuwait	286	63	61.1	67.1	32.9	76	8.7	-	3.5	0.3	-
Alqahatani, 2019 (16)	United Arab Emirates	715	50	-	77	23	69.9	27.5	1.8	9.2	-	-
Arabi, 2013 (17)	Qatar	987	-	49 (ME); 62 (SA)	63 (ME); 88 (SA)	37 (ME); 12 (SA)	-	-	-	-	-	-
Batt, 2016 (18)	United Arab Emirates	384	53	50.9	76	24	54.2	30	0.5	3.1	-	-
Batt, 2017 (19)	United Arab Emirates	514	52	-	75	25	62.6	28.6	1	6.6	-	-
bin Sallee, 2015 (20)	Saudi Arabia	96	-	62.9	62.5	37.5	74	20.8	-	4.8	-	-
Conroy, 1999 (13)	Saudi Arabia	39	-	55.4	57.3	42.7	-	5.1	-	-	5.1	-
Irfan, 2016 (21)	Qatar	447	51	-	80.5	19.5	63.3	20.6	2.7	13	8.1	-
Irfan, 2018 (22)	Qatar	397	71 (GCC); 52 (NA)	-	60 (GCC); 84.8 (NA)	40 (GCC); 15.2 (NA)	88.8 (GCC); 72.3 (NA)	17.2 (GCC); 16.1 (NA)	-	10.2 (GCC); 9.9 (NA)	4.9 (GCC); 10.7 (NA)	-
Nadar, 2018 (23)	Oman	216	-	55	69.4	30.6	-	-	-	39.4	13	-
Ong, 2015 (24)	United Arab Emirates	405	50	49.7	82.7	17.3	54.3	10.5	0.8	14	3	-
Patel, 2014 (25)	Qatar	987	-	57	72.7	27.3	-	-	-	-	40.2	-
Salam, 2013 (26)	Qatar	801	-	56	-	-	-	-	-	-	-	-
Salam, 2018 (27)	Regional	89	-	-	-	-	-	-	-	-	13	-
Paediatric cases												
Batt, 2017 (28) ^b	United Arab Emirates	14	4	-	43	57	36	26	-	14	-	-
bin Sallee, 2016 (29)	Saudi Arabia	23	-	4	69.6	30.4	87	4.3	-	-	-	-
Conroy, 1999 (13)	Saudi Arabia	27	-	5.3	58.8	41.2	-	0	-	-	5.8	-
Tham, 2018 (30)	United Arab Emirates	17	7	-	76.5	23.5	52.9	11.8	-	5.9	5.9	-

CPR: cardiopulmonary resuscitation; AED: automated external defibrillator; EMS: emergency medical services; ROSC: return of spontaneous circulation; GP: general practitioner; ED: emergency department; GCC: Gulf Cooperative Council; NA: North African; ME: Middle Eastern; SA: South Asian.

N-dash (-): not reported.

aPre and post refers to pre and post implementation of dispatcher-assisted CPR.

bUnpublished manuscript; pre-print available on request.

Figure 2 Process and outcome results of adult samples in studies on out-of-hospital cardiac arrest in countries of the Gulf Cooperation Council

bCPR=bystander cardiopulmonary resuscitation; bAED= bystander automated external defibrillator; ROSC=return of spontaneous circulation.

^aUnpublished manuscript; pre-print available on request.

cardiac arrest in several studies (16,18,21). Data on specific process and outcome measures for national populations were not well reported in the studies.

Process and outcome characteristics

The use of emergency medical services was low, as was bystander cardiopulmonary resuscitation, rates of return of spontaneous circulation and survival to hospital discharge compared with international figures. The rate of use of emergency medical services was rarely reported, and ranged from 1.4% (23) to 31% (20). The rate of bystander cardiopulmonary resuscitation ranged from 5.1% (13) to 30% (18). The rate of use of an automated external defibrillator by a bystander was reported at less than 3% for any study that reported such data. The rate of return of spontaneous circulation ranged from 1.6% (15) to 39.4% (23) but most studies reported this rate at less than 10%. The rate of survival to hospital discharge was often not reported and ranged from 2% (15) to 40.2% (25); however, most studies reported rates less than 10% (Figure 2).

Paediatric cases

Characteristics

Only four studies reported paediatric out-of-hospital cardiac arrest. Children who experienced out-of-hospital cardiac arrest in the GCC were mostly male and the out-of-hospital cardiac arrest in a significant proportion of the cases had a non-medical etiology (23.5–45.0%), including drowning. Most cases of paediatric out-of-hospital cardiac arrest occurred at home, ranging from 36% (28) to 87% (29) of all cases of paediatric out-of-hospital cardiac arrest (Table 1 and Figure 3; see Appendix IV for details).

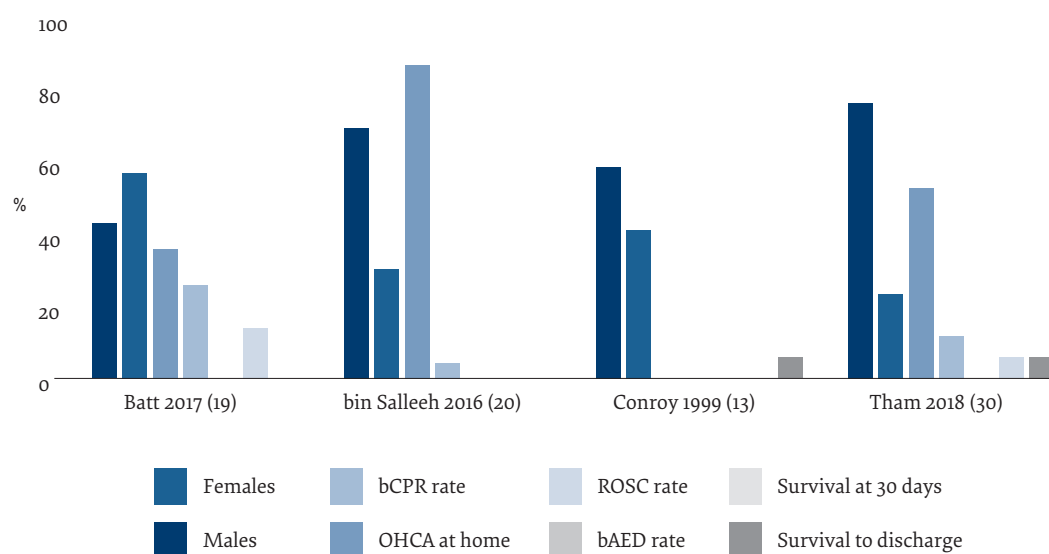
Process and outcome characteristics

We observed low rates of: bystander cardiopulmonary resuscitation rates; return of spontaneous circulation rates; survival to hospital discharge rates across the paediatric out-of-hospital cardiac arrest studies in the region (Figure 3). Bystander cardiopulmonary resuscitation ranged from 0% (13) to 26% (28). No studies of paediatric out-of-hospital cardiac arrest cases reported the use of automated external defibrillator by bystander. Two studies reported the rate of return of spontaneous circulation, 5.9% (30) and 14% (28). Two studies reported a survival to discharge rate of about 6% (13,30). Pre-existing medical conditions were reported for cases of paediatric out-of-hospital cardiac arrest in several studies and varied from 23.5% (30) to almost 70% (29).

Discussion

The causes of lower survival from out-of-hospital cardiac arrest in the GCC than reported in international studies are anecdotally related to unique demographic, cultural and logistical contexts of the region. Given these challenges, and the lack analysis of the literature, we explored out-of-hospital cardiac arrest in the GCC in a scoping review. The studies we included reported low rates of survival to discharge for out-of-hospital cardiac arrest (1–13%) when compared with other international studies, e.g. 10–23% (31). After examining studies from countries in the GCC, we suggest several unique characteristics are associated with out-of-hospital cardiac arrest in the region including characteristics related to process and outcomes. Despite the mortality associated with out-of-hospital cardiac arrest in the region, this condition remains poorly researched, with a lack of a coordinated effort to improve process and outcomes.

Figure 3 Demographic, process and outcome results of paediatric samples in studies on out-of-hospital cardiac arrest in countries of the Gulf Cooperation Council



bCPR=bystander cardiopulmonary resuscitation; bAED=bystander automated external defibrillator; ROSC=return of spontaneous circulation).

Characteristics of out-of-hospital cardiac arrest in GCC countries

People experiencing out-of-hospital cardiac arrest in GCC countries are predominantly male, and younger and with more co-morbid conditions than those with out-of-hospital cardiac arrest elsewhere (15,18,20; see Appendix III for details). We suggest a number of reasons for these findings. One proposed cause for the observed level of cardiac conditions is the so-called obesogenic urbanization that has occurred rapidly in the region as a result of oil wealth (32). A number of studies in our review reported high rates of cardiac risk factors including diabetes mellitus, hypertension, hyperlipidaemia, chronic renal failure and acute coronary syndrome (17,18,22,23,24,27). In addition, the large expatriate populations living in some GCC countries, and their unique lifestyle risk factors (such as high rates of smoking) may have contributed to the observed young age and male dominance of cases of out-of-hospital cardiac arrest in our review (16,18,21). We also observed differences in the demographics of out-of-hospital cardiac arrest in these expatriate populations compared with the national populations (16,18,21; see Appendix III for details). For example, expatriates were normally younger and more likely to smoke compared with nationals (17,22).

Pre-hospital resuscitation

In the studies we reviewed, most cases of out-of-hospital cardiac arrest occurred at home, which is consistent with international findings (33). Cases of cardiac arrest in public places have generally been reported to have better outcomes in studies conducted outside the GCC (34). This difference is likely because more cardiac arrests are witnessed, early activation of the emergency medical services and early provision of bystander cardiopulmonary resuscitation and automated external defibrillation.

Research shows that early response before the arrival of emergency medical services is crucial in the outcomes of out-of-hospital cardiac arrest, i.e. recognizing out-of-hospital cardiac arrest, calling for help and providing bystander cardiopulmonary resuscitation and automated external defibrillation (34,35). We observed low levels of use of emergency medical services (reported in two studies, range 1.4–35%), low bystander cardiopulmonary resuscitation rates (reported in 10 studies, range 3–30%) and very low bystander use of automated external defibrillators in the studies in our review. Variation in response times and an absence of integrated community response systems mean that death from out-of-hospital cardiac arrest in GCC countries is likely to occur at the scene. These findings highlight a weakness in the public response to out-of-hospital cardiac arrest in the region. Anecdotal reasons for such challenges include a lack of defibrillators in public places, so-called good Samaritan laws that stipulate only certified people should provide medical assistance, lack of governing bodies to oversee all aspects of the medical emergency response, the rural residence of significant portions of the population, and cultural norms (18). Cultural challenges include a lack of knowledge of cardiopulmonary resuscitation, a lack of confidence to intervene, and barriers to cardiopulmonary resuscitation and the use of automated external defibrillators, especially on females experiencing out-of-hospital cardiac arrests (36). We also observed over-reliance on private transport rather than emergency medical services to transport patients with out-of-hospital cardiac arrest, which mirrors results of non-out-of-hospital cardiac arrest studies in the region (37). Attempts to address such challenges are bringing results, as evidenced in the reported increased use of emergency medical services for out-of-hospital cardiac arrest (16,18,19). However, public perceptions on recognizing and intervening in

out-of-hospital cardiac arrest have yet to be studied in GCC countries.

In other regions, developing integrated community response models has led to substantial improvements in outcomes of out-of-hospital cardiac arrest. Ireland is a good example, and it shares characteristics of rurality in common with GCC countries (38,39), despite their obvious geographical differences. In 2018, 2442 cases of out-of-hospital cardiac arrest were reported in Ireland. Of these cases, 81% received bystander cardiopulmonary resuscitation (excluding cases witnessed by the emergency medical services), 22% received bystander automated external defibrillation, 26% had return of spontaneous circulation and 7.2% survived to discharge, most of whom had cerebral performance scores of 1 or 2 (40). These results are a significant improvement on the national figures from only 5 years before when 1885 cases out-of-hospital cardiac arrest were recorded, of whom 69% received bystander cardiopulmonary resuscitation (excluding cases witness by the emergency medical services), 16% received bystander automated external defibrillation, 23% had return of spontaneous circulation and 6.3% survived to discharge (41). In that 5-year period, Ireland had developed a national network of integrated community response schemes, focused on the provision of early cardiopulmonary resuscitation, including dispatcher-assisted cardiopulmonary resuscitation. As a result, continued improvements in measures of out-of-hospital cardiac arrest are likely in the future. Given the challenges we observed in this review in relation to access to emergency medical services, bystander cardiopulmonary resuscitation, bystander use of automated external defibrillators and cultural and logistical barriers, rates of return of spontaneous circulation and survival to hospital discharge were low across the region. In other words, lower survival as an outcome is reflective of process issues in the resuscitation attempt, particularly in the pre-arrival phase.

Lack of research and coordinated efforts

The processes and outcomes related to out-of-hospital cardiac arrest are well researched in a number of countries, in part due to established, coordinated cardiac arrest registries. These registries may be national (39) or regional (31), and they allow researchers to examine trends, correlations and concerns related to out-of-hospital cardiac arrest with large prospectively collected datasets. Another example is the Pan-Asian Resuscitation Outcomes Study (PAROS), an international cardiac arrest registry study of which the United Arab Emirates is a reporting member (24). Our review also showed that out-of-hospital cardiac arrest research efforts across the GCC are infrequent, and even within countries, research efforts on out-of-hospital cardiac arrest are not strategically coordinated. For example, none of the existing PAROS studies in the United Arab Emirates reported on out-of-hospital cardiac arrest in Abu Dhabi. Thus, these publications do not present a complete account of out-of-hospital cardiac arrest in the United Arab Emirates. The heterogeneity of populations

within PAROS across Asia and the Middle East is a challenge as the aggregated data are not always useful for informing strategies in particular regions such as the GCC (42). In some GCC countries, outcomes of out-of-hospital cardiac arrest are unknown due to a complete lack of reporting. Despite a previous call for a regional initiative for data collection and sharing (43), no concerted effort has been made to create reporting databases for out-of-hospital cardiac arrests in GCC countries. As a result of this lack of coordinated effort, we cannot provide scientific answers to research questions, which creates a barrier to evidence-informed policy- and decision-making in the GCC. Furthermore, the provision of public education, coordination of public information campaigns, improved bystander and community response to out-of-hospital cardiac arrest, strategic planning of emergency medical response and the coordination of research efforts are (where they exist) spread across many local or national agencies within each country. This makes it more difficult to achieve a coordinated effort in the management of out-of-hospital cardiac arrest. Without such strategic oversight, there is potential for duplication of effort, missed opportunities to strengthen the response to out-of-hospital cardiac arrest and a lack of compatibility of findings both within and between countries in the region.

Conclusion

Given our findings on the characteristics of people experiencing out-of-hospital cardiac arrest in the GCC countries and the response to and management of such incidents, efforts are needed to reduce the burden of cardiac arrest in GCC countries. Such efforts, which largely reflect the recommendations of the Global Resuscitation Alliance (44), include: (i) creation of a lead agency in each country for strategic oversight of preparedness, response, management and research for out-of-hospital cardiac arrest; (ii) development of community response models; (iii) legislation of equivalents to the so-called good Samaritan law (45,46); (iv) implementation of public health initiatives to reduce cardiac risk factors; (v) coordination of public information campaigns on recognition and management of out-of-hospital cardiac arrest, including early access to emergency medical services and early cardiopulmonary resuscitation (47,48); (vi) improvement in access to automated external defibrillators in high-risk locations and creation of national automated external defibrillator registries (49,50); and (vii) establishment and maintenance of registries of out-of-hospital cardiac arrest in each country and the GCC region which align with international conventions (51).

Our findings need to be interpreted in the context of certain limitations. We may not have identified all relevant studies despite our attempts to make a comprehensive search. Our search and review was restricted to articles published in English and Arabic, but this does not inherently bias a review (52). The Google Scholar searches were limited to the first 300 results which is considered adequate for grey literature searches

(53). Further grey literature sources may exist that we did not identify; however, we attempted to minimize this risk by using the Grey-Matters checklist (11), contacting experts on out-of-hospital cardiac arrest in the region and searching non-indexed sources. A number of studies included data on presumed cardiac etiology as well as traumatic out-of-hospital cardiac arrest. We attempted to identify and report only data on non-traumatic out-of-hospital cardiac arrest where possible, but this was not always possible. Finally, there are a few studies on paediatric out-of-hospital cardiac arrest in our review. Despite the limitations associated with such a small number of paediatric studies, we report them here to

provide some collective insight into paediatric out-of-hospital cardiac arrest in GCC countries.

Despite these limitations, our review is the first to collate and comprehensively report data on out-of-hospital cardiac arrest in the GCC region and highlights the considerable burden associated with out-of-hospital cardiac arrest in the region. We highlighted unique demographic traits and challenges related to processes and outcomes of out-of-hospital cardiac arrest in the region, as well as the paucity of research on the topic and the lack of a coordinated effort within the region in responding to and managing out-of-hospital cardiac arrest.

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Arrêt cardiaque extrahospitalier dans les pays du Conseil de Coopération du Golfe : étude exploratoire

Résumé

Contexte : Les données publiées sont insuffisantes en ce qui concerne les interventions en cas d'arrêts cardiaques extrahospitaliers et leurs conséquences au Moyen-Orient. Les données disponibles quelles qu'elles soient n'ont pas été analysées de manière exhaustive.

Objectifs : La présente étude avait pour objectif d'évaluer des personnes ayant été victimes d'un arrêt cardiaque extrahospitalier dans les pays membres du Conseil de Coopération du Golfe (Arabie saoudite, Bahreïn, Émirats arabes unis, Koweït, Oman et Qatar) ainsi que les interventions pour ces incidents et leurs conséquences.

Méthodes : Il s'agissait d'une étude exploratoire de la littérature publiée et de la littérature grise sur les arrêts cardiaques extrahospitaliers dans les pays du Conseil de Coopération du Golfe entre 1990 et juin 2019. Les études en anglais et en arabe étaient admissibles à l'inclusion. Des recherches ont été menées dans MEDLINE, CINAHL, Web of Science et EMBASE, ainsi que dans des revues non indexées pertinentes. Des recherches sur Google ont également été effectuées. Les références des études incluses ont été examinées pour trouver des articles pertinents. Des experts de ce domaine ont été consultés dans la Région.

Résultats : Sur 647 citations extraites, 24 études ont été incluses pour l'extraction et l'analyse des données. Aucune littérature n'a été identifiée pour Bahreïn. Les personnes ayant été victimes d'un arrêt cardiaque extrahospitalier dans la Région étaient plus jeunes, principalement de sexe masculin et présentaient davantage de comorbidités que dans d'autres régions du monde. Le taux de recours aux services médicaux d'urgence était faible dans les pays du Conseil de Coopération du Golfe, tout comme la réanimation cardio-respiratoire effectuée par un passant, le retour à la circulation spontanée et la survie jusqu'à la sortie de l'hôpital.

Conclusions : Il existe un manque d'efforts coordonnés pour faire face à l'arrêt cardiaque extrahospitalier, notamment en matière de recherche, au sein des pays du Conseil de Coopération du Golfe et entre eux. Il est recommandé de mettre en place des organismes chefs de file responsables de l'élaboration et de la coordination des stratégies de lutte contre les arrêts cardiaques extrahospitaliers, telles que la riposte communautaire, l'éducation du public et les bases de données de signalement.

السكتة القلبية خارج المستشفى في بلدان مجلس التعاون الخليجي: استعراض استكشافي

ألن بات، تشيلسي لانوس، شانون ديلبورت، دلال الحسن، شين نو كس، عاصم الحمودي، ميجان أندرسون، صالح فارس، فيرجال كامينز

الخلاصة

الخلفية: هناك نقص في البيانات المنشورة حول الاستجابة للسكتة القلبية خارج المستشفى ومخرجاتها في الشرق الأوسط. ولم يتم تحليل البيانات الموجودة تحليلًا شاملاً.

الأهداف: هدفت هذه الدراسة إلى تقييم خصائص الأشخاص الذين أصيبوا بالسكتة القلبية خارج المستشفى في بلدان مجلس التعاون الخليجي (البحرين والكويت وعمان وقطر والمملكة العربية السعودية والإمارات العربية المتحدة) والاستجابة لهذه الأحداث ومخرجاتها.

طرق البحث: كان هذا استعراضًا استكشافيًا للمؤلفات غير الرسمية والمنشورة حول السكتة القلبية خارج المستشفى في بلدان مجلس التعاون الخليجي في الفترة من عام 1990 إلى يونيو/حزيران 2019. وكانت الدراسات باللغتين العربية والإنجليزية مؤهلة للإدراج في الاستعراض. وتم البحث باستخدام قاعدة بيانات MEDLINE وقاعدة بيانات CINAHL، وموقع شبكة العلوم، وقاعدة بيانات EMBASE، بالإضافة إلى المجلات غير المفهرسة ذات الصلة بالموضوع. كما أجريت عمليات بحث باستخدام محرك Google. وتم المسح الضوئي لمراجع الدراسات المدرجة من أجل المقالات ذات الصلة بالموضوع. وتمت استشارة خبراء في هذا الموضوع في الإقليم.

النتائج: من بين 647 استشهدًا تم استرجاعها، أُدرجت 24 دراسة لاستخراج البيانات وتحليلها. ولم تُحدد أي مؤلفات لدولة البحرين. وكان الأشخاص الذين أصيبوا بالسكتة القلبية خارج المستشفى في الإقليم أصغر سنًا وأغلبهم من الذكور ويعانون من حالات مرضية مصاحبة بدرجة أكبر مما هو مُبلغ عنه في أقاليم أخرى من العالم. وكان استخدام الخدمات الطبية في حالات الطوارئ منخفضًا في جميع بلدان مجلس التعاون الخليجي، وكذلك الإنعاش القلبي الرئوي بواسطة أحد المارة، والعودة التلقائية للدورة الدموية، والبقاء على قيد الحياة حتى التخريج من المستشفى.

الاستنتاجات: هناك نقص في الجهود المنسقة لمعالجة السكتة القلبية خارج المستشفى، بما يشمل إنتاج البحوث، داخل بلدان مجلس التعاون الخليجي وفيما بينها. ويُوصى بإنشاء هيئات رائدة مسؤولة عن وضع استراتيجيات لمعالجة السكتة القلبية خارج المستشفى، وتنسيقها، مثل الاستجابة المجتمعية وتثقيف العامة وقواعد بيانات الإبلاغ.

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Prevalence of exposure to violence and related factors among high school students in Turkey

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Abstract

Background: Exposure to violence during childhood can have an adverse effect on health and well-being.

Aims: To determine the frequency of exposure to violence among ninth-grade high school students in Kars, Turkey, and violence-related factors. Also, to examine whether frequency of exposure to violence differed with respect to school type.

Methods: We included 1730 ninth-grade high school students in Kars in this cross-sectional study that used stratification and cluster sampling methods, and 2 questionnaires. The first questionnaire was used to determine the socioeconomic and sociodemographic characteristics of the students. The second questionnaire was the Exposure to Violence Scale. χ^2 and backward logistic regression analyses were performed to determine the independent variables among potential risk factors and exposure to violence.

Results: Exposure to violence was found to have a prevalence of 65.8% among ninth-grade high school students. Binary analysis revealed that frequency of exposure to violence was differed significantly by type of high school, place of residence, type of family, and parents' occupational status. Backward logistic regression showed that type of high school and type of family were risk factors for exposure to violence.

Conclusion: The rates of exposure to violence were high among ninth-grade high school students in Kars. Preventive, protective and ameliorating intervention steps should be taken more seriously.

Keywords: high school, students, Turkey, violence

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Introduction

The World Health Organization defines adolescent as any individual between the ages of 10 and 19 years (1). This age group constitutes 17.2% of the total population of Turkey (2). Adolescence is a complicated and problematic period, in which several mature characteristics are gained, and physical, mental and social changes are experienced simultaneously (3). Adolescents see changes in both their bodies and personal characteristics, which begin to be shaped at this time. Although these changes are personal, the effects on family and the environment cannot be ignored (4).

Violence is an important problem in many countries and is an important cause of mortality and morbidity (5–10). Despite a drop in the number of deaths caused by firearms and violence, firearm injuries are the second most common cause of death among adolescents and young adults in the United States of America (USA) (5). In Turkey, there are no programmes to monitor adolescents' violent behaviour and exposure to violence. The US Centers for Disease Control and Prevention (CDC) in the U.S. developed the Youth Risk Behavior Surveillance System (YRBSS) in 1989 to observe the health risk behaviours that lead to mortality, morbidity and social

problems among adolescents and adults. The YRBSS observed behaviours in 6 categories: (1) behaviours that contribute to unintentional injury and violence; (2) sexual behaviours related to unintended pregnancy and sexually transmitted diseases (human immunodeficiency virus); (3) alcohol and other drug use; (4) tobacco use; (5) unhealthy dietary behaviour; and (6) inadequate physical behaviour (11).

Unfortunately, schools are environments that are central to the acquisition of violent behaviours. Violence is internalized through social learning and is taken for granted, as it is frequently encountered in the school environment (12–14). In a study conducted by the Turkish Parliamentary Investigation Committee in 2007, data collected in high schools and equivalent institutions showed that 35.5% of students engaged in physical violence, 48.7% in verbal violence, 27.6% in emotional violence and 11.7% in sexual violence (15). Some studies have indicated that engagement in violence and exposure to violence vary significantly by school type (16–18). Despite the importance of the issue and various field studies, the results obtained have only been implemented recently in educational policies (14).

This study aimed to detect the frequency at which high school students were exposed to violence in the

province of Kars, Turkey, to determine the factors that are related to exposure to violence, and whether violence varies by school type.

Methods

Study design and participants

This cross-sectional study included 5085 ninth-grade students in the province of Kars, Turkey, between 2017 and 2018. The formula $n = Nt^2pq / (d^2(N-1) + t^2pq)$ was used to calculate the sample size necessary. The sample size was calculated to be 1634 students, considering 50% prevalence, 95% confidence level and 2% deviation. The sample was distributed based on school type and number of students in the school: 720 students in Anatolian high schools, 541 in vocational high schools and 373 in Islamic divinity high schools. However, the sample was enlarged by 10% due to absences and refusals to participate. Therefore, the sample size was set at 1798 students. The study was limited to the ninth grade, as it was difficult to reach students and classes in terms of time and facilities.

Instrumentation

The research data were collected using the data collection form and The Exposure to Violence Scales. A data collection form was administered to all of the classrooms during lessons and took 45–60 minutes to complete. The data collection form was developed by the researchers and consisted of 15 questions that evaluated individual and parental characterizations of the students. In the students' individual characterizations, age, gender, residential area and high school type were evaluated. In the students' parental characterizations, family type, number of persons living in the family, number of siblings, whether the parents were biological, occupation of parents, educational level of parents and income status of parents were evaluated. High school types were Islamic divinity high school, Anatolian high school and vocational high school. Islamic divinity high schools are institutions that provide education for students who are interested in religious issues. Anatolian high schools are institutions that prepare students for higher education and provide foreign language education. Vocational high schools are institutions that provide vocational education together with general cultural lessons. The period of study in each high school is 4 years. For family income status, the students were asked to select one of the following expressions: 'total income coming home is insufficient for the home's subsistence;', 'it barely suffices for the home's subsistence' and 'it comfortably suffices for the home's subsistence'.

The Exposure to Violence Scales consisted of 2 4-point Likert-type scales: the Recent Exposure to Violence Scale (REVS; 26 items) and the Past Exposure to Violence Scale (PEVS; 12 items). There were a total of 38 items, ranging from "never" to "almost every day". The scales were first developed by Singer et al. in 1995 (19), who later added some items and finalized the scales (20). The validity and reliability of the Exposure to Violence Scale were verified for the Turkish context by Kaya and Bilgin in 2012 (21).

The reliability coefficients of the factors encompassing different types of violence in the REVS were: witnessing violence in the school environment ($\alpha = 0.89$); being exposed to violence at home ($\alpha = 0.76$); witnessing violence at home ($\alpha = 0.67$); being subjected to violence in the school environment ($\alpha = 0.86$); being subjected to/witnessing violence with a knife or firearm ($\alpha = 0.84$); and sexual abuse ($\alpha = 0.65$) (19). The reliability coefficients of the factors encompassing different types of violence in the PEVS were: witnessing violence in the past ($\alpha = 0.84$); being subjected to violence in the past ($\alpha = 0.81$); and being exposed to/witnessing violence with a knife or firearm ($\alpha = 0.81$) (21).

Ethics

Approval was first obtained from the Ethics Committee of the Faculty of Medicine at Kafkas University (dated 1 February 2017, number 80576354-050-99-14) between April 2017 and May 2017. Prior to implementation, the researchers informed the students about the content of the study and that participation would be on a voluntary basis.

Data analysis

SPSS version 22.0 software was used to analyse the data. Frequencies and percentages were used in the descriptive table, and the χ^2 test was used for binary comparisons (at a confidence level of $P < 0.05$). To determine the factors affecting exposure to violence, the variables with significant differences in the χ^2 test were included in the logistic regression model. Logistic regression analysis was used to determine the factors affecting exposure to violence. The backward stepwise method was used in logistic regression analysis.

Results

The student participant sample comprised 807 (46.6%) students from Anatolian high schools, 582 (33.6%) students from vocational high schools and 341 (19.7%) from Islamic divinity high schools (Table 1). It was found that 897 (53.6%) were male and 777 (46.4%) were female; 708 (41.2%) were from provincial or district centres and 1012 (58.8%) were from villages or small towns; 511 (29.7%) lived with their extended family and 1210 (70.3%) lived in an nuclear family unit; 1704 (98.8%) had a biological mother and 20 (1.2%) had a stepmother; and 1695 (99.4%) had a biological father and 11 (0.6%) had a stepfather. The mothers of 139 (8.1%) worked in the private sector, for the state, or whenever they could find work; the mothers of 242 (14.1%) were artisans or farmers; and the mothers of 1335 (77.8%) were unemployed. The fathers of 382 (22.4%) worked in the private sector or for the state; the fathers of 977 (57.3%) were artisans or farmers; and the fathers of 346 (20.3%) were unemployed. The income of 155 (9.0%) was insufficient; the income of 679 (39.5%) was barely enough; and the income of 884 (51.5%) was comfortable enough. The mothers of 493 (28.7%) did not complete primary school; the mothers of 650 (37.8%) were primary school graduates; and the mothers of 576 (33.5%) were

Table 1 Sociodemographic and socioeconomic distribution of lifelong exposure to violence

Independent variables			Dependent variables		
	Distribution		Lifelong total exposure		
	No. (%)	No (%)	Yes (%)	χ^2	P*
High school type					
Anatolian high school	807 (46.6)	168 (20.8)	639 (79.2)	121.525	0.001
Vocational high school	582 (33.6)	261 (44.8)	321 (55.2)		
Religious vocational high school	341 (19.7)	163 (47.8)	178 (52.2)		
Gender					
Male	897 (53.6)	302 (33.7)	595 (66.3)	0.006	0.938
Female	777 (46.4)	263 (33.8)	514 (66.2)		
Age					
≤ 15 yr	1217 (71.3)	401 (32.9)	816 (67.1)	2.731	0.098
≥ 16 yr	490 (28.7)	182 (37.1)	308 (62.9)		
Residential area					
Province/district	708 (41.2)	217 (30.6)	491 (69.4)	6.476	0.011
Small town/village	1012 (58.8)	370 (36.6)	642 (63.4)		
Family type					
Extended family	511 (29.7)	154 (30.1)	357 (69.9)	5.100	0.024
Nuclear family	1210 (70.3)	433 (35.8)	777 (64.2)		
No. of persons living in family					
4 and below	343 (20.4)	114 (33.2)	229 (66.8)	0.173	0.677
5 and above	1336 (79.6)	460 (34.4)	876 (65.6)		
No. of siblings					
2 and below	665 (38.7)	215 (32.3)	450 (67.7)	1.215	0.270
3 and above	1054 (61.3)	368 (34.9)	686 (65.1)		
Having biological mother					
Yes	1704 (98.8)	584 (34.3)	1120 (65.7)	0.756	0.385
No	20 (1.2)	5 (25.0)	15 (75.0)		
Having biological father					
Yes	1695 (99.4)	579 (34.2)	1116 (65.8)	2.016	0.156
No	11 (0.6)	6 (54.5)	5 (45.5)		
Mother's occupation					
Private sector/state/whenever they could find work	139 (8.1)	40 (28.8)	99 (71.2)	6.214	0.045
Artisan/farmer	242 (14.1)	98 (40.5)	144 (59.5)		
Unemployed	1335 (77.8)	450 (33.7)	885 (66.3)		
Father's occupation					
Private sector/state/whenever they could find work	382 (22.4)	106 (27.7)	276 (72.3)	8.970	0.011
Artisan/farmer	977 (57.3)	350 (35.8)	627 (64.2)		
Unemployed	346 (20.3)	126 (36.4)	220 (63.6)		
Level of income					
Insufficient	155 (9.0)	56 (36.1)	99 (63.9)	0.823	0.663
Barely enough	679 (39.5)	238 (35.1)	441 (64.9)		
Comfortable enough	884 (51.5)	294 (33.3)	590 (66.7)		
Mother's educational level					
Not completed primary school	493 (28.7)	169 (34.3)	324 (65.7)	0.079	0.961
Primary school graduate	650 (37.8)	225 (34.6)	425 (65.4)		
Middle school and above	576 (33.5)	195 (33.9)	381 (66.1)		

Table 1 Sociodemographic and socioeconomic distribution of lifelong exposure to violence (concluded)

Independent variables	Distribution		Dependent variables		
	No. (%)	No (%)	Lifelong total exposure	χ^2	P*
			Yes (%)		
Father's educational level					
Not completed primary school	150 (8.7)	50 (33.3)	100 (66.7)	3.147	0.207
Primary school graduate	535 (31.1)	199 (37.2)	336 (62.8)		
Middle school and above	1035 (60.2)	339 (32.8)	696 (67.2)		
Total^a	1730 (100.0)	592 (34.2)	1138 (65.8)		

^aThe students who said "Yes" to at least 1 of the questions were considered "Yes", and students who said "No" to all of the questions were considered "No".

*P value was calculated according to lifelong total exposure.

middle school or above graduates. The fathers of 150 (8.7%) did not complete primary school; the fathers of 535 (31.1%) were primary school graduates; and the fathers of 1035 (60.2%) were middle school and above graduates. The average students' age, number of persons living in the family and number of siblings were 15.25 (standard deviation 0.68) years, 6.18 (2.52) and 3.26 (1.85), respectively. Type of high school, place of residence, family type and parental occupation all had a significant effect on students' exposure to violence (all $P < 0.05$). Gender, age, number of family members, number of siblings, biological parents, income level of parents and education level of parents had no significant effect on students' exposure to violence (all $P > 0.05$).

Of the students who responded yes to at least one of the items of each dimension in the REVS (Table 2), 398 (23.0%) had witnessed violence at home; 303 (17.5%) had been exposed to violence at home; 964 (55.7%) had witnessed violence in the school or environment; 506 (29.2%) had been exposed to violence in the school or environment; 339 (19.6%) had witnessed or been exposed to violence with a knife or firearm; and 292 (16.9%) had witnessed or been exposed to sexual abuse. In response to the PEVS (Table 3), these rates were: 749 (43.3%) had witnessed violence in the past; 427 (24.7%) had been exposed to violence in the past; and 304 (17.6%) had witnessed or been exposed to violence with a knife or firearm.

Backward logistic regression analysis showed that when Islamic divinity high school was taken as a reference, students attending Anatolian high schools were exposed to 3.54-fold more violence (Table 4). When the nuclear family type was taken as a reference, students with an extended family type were exposed to 1.31-fold more violence. The model explains 11.1% of exposure to violence.

Discussion

This is the first study to analyse the prevalence of exposure to violence among adolescents (at home, at school or in the environment where they live) in the province of Kars, Turkey. The aim was to evaluate the frequency of exposure to violence and the effect of some variables on exposure to violence.

We found that 23% of students had witnessed violence at home and 17.5% had been exposed to violence at home. This is similar to a study of the United Nations Children's Fund, which found that $> 20\%$ of participants were exposed to severe punitive treatment at home (22). The home is a place where teenagers internalize values that will form their behaviours and attitudes in the following years. In societies in which violence is used as a form of discipline and problem-solving at home, an expected finding would be that children are exposed to violence as witnesses and victims from a young age upward.

We found that 55.7% of the students were witnesses to violence at school or the environment in which they lived, and 29.2% were exposed to violence directly at school/the environment in which they sat in the past year. In El Salvador, about 23% of students reported that they could not go to school one or more days due to their concerns about safety (23). According to data from the CDC in 2019, in the USA, 1 in every 5 adolescents is exposed to bullying at school (24). According to the results of the YRBSS (2007–2017), 19% of students were bullied at school (25). Half of seventh- to ninth-grade students in Yemen have stated that they were exposed to physical abuse at school at least once (26). In Lebanon, 76.4% of teenagers aged 10–18 years were exposed to physical violence, and 81.2% of them were exposed to verbal/emotional violence at least once (27). The present study found lower rates than those carried out in Yemen and Lebanon, which can be explained by the conflicts in these regions. The low rates in the USA and El Salvador could be explained by the fact that the data only reflect bullying.

The present study showed that 19.6% of students witnesses or were exposed to armed/knife attacks in the past year. In the USA, 6% of school students have been threatened or injured at school at least once with a weapon (gun, knife or stick) (25). This rate was higher among boys (7.8%) than girls (4.1%). In another study, the rate for ninth-grade students was 8.5%; 9.3% among boys and 7.7% among girls (28). In the present study, the rate of exposure to knife and firearm attacks was 4.4% and 3.6%, respectively, for boys and girls. This difference, however, may stem from the inclusion of sticks as weapons in the American data (28).

Table 2 Distribution of responses to the Recent Exposure to Violence Scale (in the past year)

	No (%)	Yes (%)
Witnessing violence at home		
How often over the past year did you see someone else at home being told they were going to be hurt?	1585 (91.6)	145 (8.4)
How often over the past year have you seen someone else being slapped, punched, or hit by someone at home?	1474 (85.2)	256 (14.8)
How often over the past year have you seen someone else getting beaten up at home?	1529 (88.4)	201 (11.6)
Witnessing violence at home total^a	1332 (77.0)	398 (23.0)
Being exposed to violence at home		
How often over the past year did anyone at home tell you they were going to hurt you?	1631 (94.3)	99 (5.7)
How often over the past year have you yourself been slapped, punched, or hit by someone at home?	1533 (88.6)	197 (11.4)
How often over the past year have you been beaten up at home?	1552 (89.7)	178 (10.3)
Being exposed to violence at home total^a	1427 (82.5)	303 (17.5)
Witnessing violence in school and environment		
How often over the past year did you see someone else at school being told they were going to be hurt?	1234 (71.3)	496 (28.7)
How often over the past year did you see someone else in your neighbourhood being told they were going to be hurt?	1387 (80.2)	343 (19.8)
How often over the past year have you seen someone else being slapped, punched, or hit by someone in school?	1103 (63.8)	627 (36.2)
How often over the past year have you seen someone else being slapped, punched, or hit by someone in your neighbourhood?	1293 (74.7)	437 (25.3)
How often over the past year have you seen someone else getting beaten up at school?	1135 (65.6)	595 (34.4)
How often over the past year have you seen someone else getting beaten up in your neighbourhood?	1303 (75.3)	427 (24.7)
Witnessing violence in school and environment total^a	766 (44.3)	964 (55.7)
Being exposed to violence in school and environment		
How often over the past year did anyone at school tell you they were going to hurt you?	1484 (85.8)	246 (14.2)
How often over the past year did anyone in your neighbourhood tell you they were going to hurt you?	1574 (91.0)	156 (9.0)
How often over the past year have you yourself been slapped, punched, or hit by someone in school?	1480 (85.5)	250 (14.5)
How often over the past year have you yourself been slapped, punched, or hit by someone in your neighbourhood?	1628 (94.1)	102 (5.9)
How often over the past year have you been beaten up in school?	1584 (91.6)	146 (8.4)
How often over the past year have you been beaten up in your neighbourhood?	1637 (94.6)	93 (5.4)
Being exposed to violence in school and environment total^a	1224 (70.8)	506 (29.2)
Being exposed to/witnessing violence with a knife or firearm		
How often over the past year have you yourself been attacked or stabbed with a knife?	1654 (95.6)	76 (4.4)
How often over the past year have you seen someone else being attacked or stabbed with a knife?	1508 (87.2)	222 (12.8)
How often over the past year has someone pointed a real gun at you?	1669 (96.5)	61 (3.5)
How often over the past year have you seen someone pointing a real gun at someone else?	1588 (91.8)	142 (8.2)
How often over the past year have you yourself actually be shot at or shot with a real gun?	1668 (96.4)	62 (3.6)
How often over the past year have you see someone else being shot at or shot with a real gun?	1592 (92.0)	138 (8.0)
Being exposed to/witnessing violence with a knife or firearm total^a	1391 (80.4)	339 (19.6)
Abuse		
How often over the past year have you been touched in a private place on your body where you did not want to be touched?	1567 (90.6)	163 (9.4)
How often over the past year have you seen someone else being touched in a private place on their body where they did not want to be touched?	1489 (86.1)	241 (13.9)
Abuse total^a	1438 (83.1)	292 (16.9)

^aThe students who said "Yes" to at least one of the questions were considered "Yes", the students who said "No" to all of the questions were considered "No."

The present study found that 9.4% of the students were exposed to sexual abuse and 13.9% witnessed sexual abuse. A study in Turkey in 2007 found that 15.8% of cases of sexual violence occurred in the previous 3 months (29). YRBSS found that 10.4% of students in the USA in 2013

were forced by their beloveds or people they had dated to engage in kissing, touching or sexual intercourse, through the use of physical violence and against their wishes (28). In the same study, this rate was found to be 10.9% for ninth-grade students. YRBSS found that 9.7% of

Table 3 Distribution of responses to the Past Exposure to Violence Scale (> 1 year ago)

	No (%)	Yes (%)
Witnessing violence in the past		
Seeing someone else being told that they were going to get hurt?	1372 (79.3)	358 (20.7)
Seeing someone else being slapped, punched, or hit?	1305 (75.4)	425 (24.6)
Seeing someone else being beaten up?	1166 (67.4)	564 (32.6)
Seeing someone else being touched on a private place on their body where they did not want to be touched?	1532 (88.6)	198 (11.4)
Witnessing violence in the past total^a	981 (56.7)	749 (43.3)
Being exposed to violence in the past		
You being told by someone that they were going to hurt you?	1537 (88.8)	193 (11.2)
You being slapped, punched, or hit?	1530 (88.4)	200 (11.6)
You being beaten up?	1526 (88.2)	204 (11.8)
You being touched in a private place on your body where you did not want to be touched?	1595 (92.2)	135 (7.8)
Being exposed to violence in the past total^a	1303 (75.3)	427 (24.7)
Being exposed to/witnessing violence with a knife or firearm		
You being attacked or stabbed with a knife?	1639 (94.7)	91 (5.3)
Seeing someone else being attacked or stabbed with a knife?	1537 (88.8)	193 (11.2)
You being shot at or shot with a real gun?	1651 (95.4)	79 (4.6)
Seeing someone else being shot at or shot with a real gun?	1579 (91.3)	151 (8.7)
Being exposed to/witnessing violence with a knife or firearm total^a	1426 (82.4)	304 (17.6)

^aThe students who said "Yes" to at least one of the questions were considered "Yes", the students who said "No" to all of the questions were considered "No."

students in 2017 had been forced against their wishes, through the use of physical violence, to engage in kissing, touching or sexual intercourse at least once during the 12 months before the survey (25). In a study conducted in Kolkata, India, 12.7% of teenagers experienced instances of sexual violence towards them (30). The results of the present study are similar to the American studies but lower than the Indian study. The high rate of child abuse in Kolkata may be due to cultural beliefs and practices in Indian society.

We found that ~50% of the students witnessed violence, and ~25% were exposed to it in the past. This is lower than in the study of Wagner et al. who found that 47% of students were exposed to violence and 71% of them witnesses it (31). The reason for the lower results in the present study could be linked to the ongoing occupation and conflict in Israel and Palestine, since the study of Wagner et al. was conducted in the West Bank and East Jerusalem. Additionally, violence by police or soldiers might have increased exposure to violence in that study.

The students' demographic characteristics, type of school, socioeconomic status and school type were among the factors affecting students (16,32,33). The present study found a relationship between high school type, residential area, family type and parental occupation and being exposed to violence. According to logistic regression analysis, high school type and family type were also shown to be predictive factors for exposure to violence. Accordingly, the students studying at the Anatolian high schools and those with extended families were at risk of exposure to violence. The Anatolian high schools have more students compared with other types of high school. Having a high number of students can cause

teachers to spend less time with them and therefore not educate each student sufficiently. The students who do not receive sufficient education and interest may exhibit less responsible behaviours. Therefore, the rates of students being exposed to violence at the Anatolian high schools may be more than in the other high schools. Being subject to violence in the extended family can be explained by the social learning theory. Students living in extended families may be exposed to more violence or witness it more often since they live with more people. This condition can also leave students living in an extended family unprotected against violence in other areas. In a study in Yemen, the important precursors of physical abuse were male gender and extended family type, which is similar to the present study (26). In a study in Lebanon, gender, residential area and school type were determined as predictive factors for exposure to violence (27).

One of the strengths of the present study was that it included a high number of students to analyse the prevalence of exposure to violence among high school students in Eastern Turkey. Another strength was that it provided information about not only the existence of violence, but also the extent of different types of violence (verbal, physical, with a knife or firearm, or sexual) and the place of exposure (home, school, or the environment where they live). This study had some limitations. First, the study sample was limited to the ninth grade. This meant that we were not able to compare exposure to violence among students in other grades. Second, we reached only 91.67% of the students targeted in the Islamic divinity high schools (341/372) since the students did not attend lessons, were in practice, did not want to

Table 4 Backward logistic regression analysis

Dependent analysis: lifelong total exposure							
	Independent variables	β	SE	Wald	P	OR	95% CI
High school type							
Step 1	Anatolian high school	1.268	0.144	77.924	0.001**	3.554	2.682–4.709
	Vocational high school	0.127	0.142	0.801	0.371	1.135	0.860–1.499
	Religious Vocational high school			1.000 (Reference)			
Family type							
	Extended family	0.278	0.121	5.233	0.022*	1.320	1.041–1.675
	Nuclear family			1.000 (Reference)			
Residential area							
	Province/district	0.185	0.118	2.461	0.117	1.203	0.955–1.515
	Small town/village			1.000 (Reference)			
Father's occupation							
	Private/state	0.257	0.171	2.249	0.134	1.292	0.924–1.807
	Artisan/farmer	0.022	0.139	0.025	0.875	0.978	0.744–1.286
	Unemployment/when has work			1.000 (Reference)			
Mother's occupation							
	Private/state/ when has work	0.287	0.209	1.887	0.170	1.332	0.885–2.004
	Artisan/farmer	0.129	0.156	0.688	0.407	0.879	0.647–1.193
	Unemployment			1.000 (Reference)			
Nagelkerke R² 0.113							
High school type							
Step 2	Anatolian high school	1.264	0.143	78.329	0.001**	3.540	2.676–4.684
	Vocational high school	0.131	0.141	0.853	0.356	1.140	0.864–1.504
	Religious vocational high school			1.000 (Reference)			
Family type							
	Extended family	0.274	0.121	5.115	0.024*	1.316	1.037–1.669
	Nuclear family			1.000 (Reference)			
Residential area							
	Province/district	0.213	0.116	3.359	0.067	1.238	0.985–1.554
	Small town/village			1.000 (Reference)			
Father's occupation							
	Private sector/state	0.272	0.170	2.553	0.110	1.313	0.940–1.833
	Artisan/farmer	-0.050	0.138	0.133	0.716	0.951	0.741–1.246
	Unemployment/when has work			1.000 (Reference)			

*P < 0.05. **P < 0.01. CI = confidence interval; OR = odds ratio; SE = standard error.

participate in the study, or incompletely filled in the data forms, although a 10% loss rate was added to the study sampling. This resulted in the ratio of students belonging to other high school types to be higher than those belonging to the Islamic divinity high schools. Finally, violence frequency was limited by the characteristics of the exposure to violence scales.

Conclusion

There was a high level of exposure to violence among high school students in Kars. The rate of exposure to violence was greater for students who attended Anatolian high schools and had extended families. Violence is a problem that can be prevented, and this study emphasizes

the need for a 4-stage public health approach: identifying the problem; identifying its reasons and risk factors; designing and testing interventions; and increasing the number of measurement tools to evaluate the effectiveness of the interventions (34).

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Competing interests: None declared.

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Prévalence de l'exposition à la violence et facteurs associés parmi les élèves du secondaire en Turquie

Résumé

Contexte : L'exposition à la violence pendant l'enfance peut avoir un effet négatif sur la santé et le bien-être.

Objectifs : Déterminer la fréquence de l'exposition à la violence parmi les élèves de neuvième classe d'enseignement (correspondant à l'âge de 15 ans) à Kars, en Turquie, et les facteurs liés à la violence. Il s'agissait par ailleurs d'examiner si la fréquence de l'exposition à la violence différait en fonction du type d'école.

Méthodes : Nous avons inclus 1730 élèves de cette classe du secondaire à Kars dans cette étude transversale qui a utilisé des méthodes de stratification et d'échantillonnage en grappes, ainsi que deux questionnaires. Le premier questionnaire a été utilisé pour déterminer les caractéristiques socioéconomiques et sociodémographiques des élèves. Le deuxième questionnaire était l'échelle d'exposition à la violence. Des analyses du χ^2 et de régression logistique ascendante ont été réalisées afin de déterminer les variables indépendantes parmi les facteurs de risque potentiels et l'exposition à la violence.

Résultats : Il a été constaté que la prévalence de l'exposition à la violence s'élevait à 65,8 % chez les élèves de la neuvième classe d'enseignement. L'analyse binaire a révélé que la fréquence de l'exposition à la violence différait considérablement selon le type d'école secondaire, le lieu de résidence, le type de famille et le statut professionnel des parents. La régression logistique inverse a montré que le type d'école secondaire et le type de famille étaient des facteurs de risque pour l'exposition à la violence.

Conclusion : Les taux d'exposition à la violence étaient élevés parmi les élèves de cette classe du secondaire à Kars. Les mesures de prévention, de protection et d'amélioration des interventions devraient être prises plus au sérieux.

معدل انتشار التعرض للعنف والعوامل ذات الصلة به بين طلاب المدارس الثانوية في تركيا

بن علي شاتاك، مولتهان إفران، فاديم كايا، ميليك إفران

الخلاصة

الخلفية: التعرض للعنف في مرحلة الطفولة قد يكون له تأثير سلبي على الصحة والعافية.

الأهداف: هدفت هذه الدراسة إلى تحديد مدى تواتر التعرض للعنف بين طلاب المرحلة الثانوية في الصف التاسع في مدينة قارص، تركيا، والعوامل المرتبطة بالعنف. وفحص ما إذا كانت وتيرة التعرض للعنف تختلف باختلاف نوع المدرسة.

طرق البحث: أدرجنا 1730 طالباً من طلاب الصف التاسع بالمدارس الثانوية في مدينة قارص في هذه الدراسة المقطعية التي استخدمت التقسيم الطبقي وطرق أخذ العينات العنقودية، واستبيانين. واستُخدم الاستبيان الأول في تحديد الخصائص الاجتماعية الاقتصادية والاجتماعية السكانية للطلاب. وكان الاستبيان الثاني هو مقياس التعرض للعنف. وأجري اختبار مربع كاي (χ^2) وتحليلات الانحدار اللوجستي العكسي لتحديد المتغيرات المستقلة بين عوامل الخطر المحتملة والتعرض للعنف.

النتائج: تبين أن معدل انتشار التعرض للعنف بلغ 65.8% بين طلاب الصف التاسع بالمدارس الثانوية. وكشف التحليل الثنائي أن وتيرة التعرض للعنف تختلف اختلافاً كبيراً حسب نوع المدرسة الثانوية ومحل الإقامة ونوع الأسرة والوضع المهني للوالدين. وأظهر الانحدار اللوجستي العكسي أن نوع المدرسة الثانوية ونوع الأسرة من عوامل خطر التعرض للعنف.

الاستنتاج: كانت معدلات التعرض للعنف مرتفعة بين طلاب الصف التاسع بالمدارس الثانوية في مدينة قارص. وينبغي اتخاذ خطوات لتنفيذ تدخلات الوقاية والحماية والتحسين بمزيد من الجدية.

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Public health nutrition in Afghanistan-policies, strategies and capacity-building: current scenario and initiatives

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Abstract

Background: Afghanistan is grappling with high burden of malnutrition in women and children and a rising burden of noncommunicable diseases.

Aims: A narrative review was conducted with the aim of mapping current nutrition policies and capacity development initiatives to assess policy and the institutional environment and identify gaps and opportunities.

Methods: A comprehensive, broad based search was conducted, including databases and websites and policy and programme documents.

Results: The policy focuses on multisectoral efforts to address nutrition challenges; however, implementation of nutrition-specific and nutrition-sensitive interventions is not delivered uniformly at the community level due to continued conflict situations and geographic inaccessibility, lack of availability of trained human resources and weak institutions. There is limited evidence on the effectiveness of nutrition programmes in Afghanistan. Limited policy provisions are available to address nutrition issues due to the rising burden of noncommunicable diseases, urbanization and changing dietary patterns. The shortage of skilled nutritional professionals is a critical issue. Lack of institutional capacity, educational standards and accreditation mechanism poses major challenges. Ongoing training programmes are fragmented and fail to meet the requirements of a professional nutrition workforce.

Conclusion: The findings highlight that well-structured policies and strategies focusing on maternal and child nutrition provide an enabling policy environment to scale up nutrition interventions. Evidence on the implementation of programmes is needed to aid policy recommendations. The lack of an institutional mechanism for professional nutrition education highlights the great need for action in Afghanistan for public health nutrition and education.

Keywords: Afghanistan, nutrition policy, nutrition strategy, capacity-building, public health nutrition

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Introduction

The nutritional status of a population has a well-established profound effect on health and economic development (1–4). Nearly half of all deaths in children under 5 years are attributable to undernutrition, which translates into the loss of about 3 million young lives a year (5). Many low- and middle-income countries continue to face high levels of malnutrition resulting from poverty, food insecurity, food wastage and social and political situations. With recognition of its consequences for a wide range of human, social and economic outcomes, the role of nutrition in achieving the Sustainable Development Goals is acknowledged globally and has gained unprecedented attention in the global policy arena (6–10). The current impetus has brought nutrition to the centre stage in the development agenda in low- and middle-income countries, with intensive efforts to invest and address the problem of malnutrition (11).

The under-nutrition spectrum of Afghanistan, with widespread micronutrient deficiencies, highlights the high prevalence of nutritional disorders, morbidities and

mortality, particularly in mothers and children (6). It is important to understand the context that the Government of Afghanistan was facing in 2002. After decades of conflict and instability, the health system was completely dysfunctional, the physical infrastructure was ruined and educational institutes were destroyed. Access to health services was highly restricted for women and girls and their participation in education and the work force was banned. Maternal and child health indicators were very poor (12). After 2002, with continued volatile social and political situations, considerable efforts have been made to rebuild the health system (13). With extensive support from humanitarian organizations, health system reforms focused on rebuilding the health system and increasing the coverage of primary health care services. The basic package of health services (BPHS) and the essential package of hospital services (EPHS) contracted to nongovernmental organizations with a focus on increasing coverage of vaccination and other disease control programmes. After a decade of implementation of these services, a 30% reduction in mortality among

children under 5 years was observed (14). In 2018, a total of 3135 health facilities were functional in the country, which ensured health access within 2 hours distance to almost 87% of the population (15,16). Despite this progress, Afghanistan continues to be one of the most fragile countries in South Asia, ranking 108th of 117 countries on the Global Hunger Index and 42nd of 45 countries by the Hunger and Nutrition Commitment Index on the country government's political commitment to tackling hunger and malnutrition (17,18). Wide geographical and ethnic disparities and high private out-of-pocket expenditure are continuing challenges (15,19).

With the recent thrust to tackle the nutrition problems, the Government of Afghanistan has launched several strategic initiatives to address the burden of malnutrition with the support of the United Nations and other humanitarian organizations. Although efforts have been made to improve the policies and structuring of nutrition programmes, the nutrition agenda of the country must be aligned to deal with upcoming new challenges arising due to climate change and environment, the increasing prevalence of noncommunicable diseases, poverty, population growth, urbanization and changing dietary patterns. Furthermore, translating policies into action at the grass roots level is not possible without an efficient and skilled nutrition workforce. The nutrition programme goals of the country cannot be accomplished without investing in the capacities of people, organizations and institutions. Skills and knowledge of the nutrition workforce to design, plan and monitor nutrition interventions as well as effective programme delivery are important for successful nutrition actions (20,21).

Although a positive impact on nutrition outcomes has been documented, there is limited evidence on the effectiveness of the nutrition programmes and capacity-building initiatives to develop a skilled nutrition workforce (22).

This narrative review attempts to map and describe the nutrition policies and programmes of Afghanistan with the aim of assessing the nutrition policy and institutional environment for responding to the current nutrition conditions faced by the country and its alignment towards addressing future challenges. The review also attempts to explore professional nutrition education initiatives to develop a skilled nutrition workforce in Afghanistan with a view to understanding its status, gaps and opportunities.

Methods

We conducted a literature search for nutrition-related policies, programmes, training and capacity-building activities published from Afghanistan and in peer reviewed research papers. The literature search was performed using Google, Google Scholar and PubMed.

The policy and programme documents and reports were searched using a combination of search terms and phrases, including: health and nutrition status, health systems in Afghanistan, nutrition in Afghanistan,

nutrition policy of Afghanistan, nutrition strategy of Afghanistan, health policy of Afghanistan, nutrition status of Afghanistan, nutrition institutes in Afghanistan, nutrition training in Afghanistan, nutrition diploma, nutrition courses in Afghanistan, community nutrition programme in Afghanistan.

Examples of search terms for PubMed include: (nutrition) AND (child nutrition) OR (maternal nutrition) OR (maternal undernutrition) OR (stunting[MeSH Terms]) OR (wasting[MeSH Terms]) OR (undernutrition[MeSH Terms]) OR (anemia[MeSH Terms]) OR (infant and child feeding) OR (breastfeeding[MeSH Terms]) OR (complimentary feeding[MeSH Terms]) AND (Afghanistan[MeSH Terms]).

The search was restricted to the last 10 years, conducted on humans and published in the English language. The reference list of selected articles was hand searched for relevant sources. The electronic search was also supplemented by a snowball approach to get information in the form of reports, documents and other literature published by various agencies working in Afghanistan.

Information pertaining to health and nutrition outcomes was derived from various national surveys and policy documents. We contacted the Public Nutrition Directorate at the Ministry of Public Health to obtain documents and reports related to programmes, ongoing training and their status. Information on recent capacity-building initiatives was also sought.

All information and data obtained are available in the public domain and are used with the permission of the Public Nutrition Directorate, Ministry of Public Health, Afghanistan.

Results

Nutrition landscape of Afghanistan

The Human Development Index for Afghanistan is one of the lowest in the world, with over one third of population living below the national poverty line and one third facing food insecurity (23). Child and maternal undernutrition is still a huge challenge, again among the worst in the world (Table 1). The undernutrition spectrum with widespread micronutrient deficiencies is characterized by wide regional inequalities and difficult geographical and sociopolitical circumstances (24). Nevertheless, increased investment in the social sector during the last decade resulted in improvement in maternal and child health and nutrition outcomes; for example, the 2013 data indicate that the prevalence of stunting (or chronic malnutrition) has decreased by about 20 percentage points since 2004, ranging from about 24% to > 70% across the country. The undernourishment of women of reproductive age dropped to about 9% in 2013. A significant improvement in iodine status was observed, with the median urinary iodine concentration among school age children dropping from > 170 µg/L in 2013 to 49 µg/L in 2004. The findings of the National Nutrition Survey

Table 1 Health and nutrition indicators in Afghanistan

Mortality indicator	Afghanistan Mortality Survey 2010	Demographic and Health Survey 2015	Afghanistan Service Provision Survey 2018
Infant mortality rate per 1000 live births	77	45	41
Under-5 mortality rate per 1000 live births	97	55	50
Maternal mortality ratio per 100 000 births^a	954	701	638
Malnutrition prevalence^b	2004 (%)	2013 (%)	2018 (%) ^c
Stunting in children under 5 years	60.5	40.9	37.0
Wasting in children under 5 years	8.7	9.5	5.0
Undernutrition BMI<18.5			
In adolescent girls aged 10–19 years		8.0	–
In women of reproductive age group	20.9	9.2	–
Iodine deficiency disorder			
In children under 5 years	71.9	29.5	–
In women of reproductive age group	74.7	40.8	–
Anaemia			
In children under 5 years	37.9	44.9	–
In women of reproductive age group	24.7	40.4	–
Vitamin A deficiency			
In children under 5 years		11.3	–
In women of reproductive age group		50.4	–
Zinc deficiency			
In children under age 5		15.1	–
In women of reproductive age group		23.4	–
Vitamin D deficiency			
In children under 5 years		81.0	–
In women of reproductive age group		95.5	–

^aInternationally comparable MMR estimates by the Maternal Mortality Estimation Inter-Agency Group (MMEIG) WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division, https://www.who.int/gho/maternal_health/countries/afg.pdf.

^bNational Nutrition Survey Afghanistan (2004 & 2013) (6).

^cAfghanistan Service Provision Assessment Survey 2018–19.

2013 highlighted the rising burden of overweight and obesity in Afghanistan, with 5.4% of children under 5 years, 11.6% of adolescent girls and about one fifth (20.7%) of women of reproductive age (15–49 years) overweight. Widespread micronutrient deficiencies continued to remain a public health challenge, with more than 95% women of reproductive age deficient in vitamin D and 40% affected by anaemia (24,25). Equity is a central issue associated with nutrition: disparities in nutritional status in Afghanistan exist across geographic locations and socioeconomic groups. Although undernutrition status is influenced by poverty, other determinants such as hygiene and sanitation, suboptimal feeding practices, gender norms and availability of health services also contribute significantly (26,27).

Policy and programme initiatives to address nutrition issues in Afghanistan

Since 2001, through the efforts of local government and humanitarian organizations, the status of maternal and child nutrition indicators has been improving slowly. Subsequently, the Public Nutrition Department within the structure of the Ministry of Public Health was

established in 2002 to look after the implementation of nutrition programmes in the country. With the support of United Nations agencies and the donor community, in 2003 the Ministry of Public Health developed the first National Public Nutrition Policy and Strategy and later revised it (2009–2013) (23,28,29). Initial nutrition policies focused on health interventions within the facilities through safe motherhood initiatives to improve antenatal care, counselling, providing micronutrient supplementation and offering nutrition education at facility and community levels. The child nutrition initiatives focused on care of severe acute malnourished children at the facilities and household intake of fortified foods. Subsequently, several nutrition-related policies and strategies were developed, including the strategy on prevention and control of vitamin and mineral deficiencies (2009) and the infant and young child feeding strategy (2009). The Nutrition Action Framework and the Afghanistan Food Security and Nutrition Agenda (known as AF-SANA, and changed to AFSeN in April 2017) were developed, and multisector action was prioritized to improve nutrition (30). The National Health Strategy 2015–2020 of the Ministry of Public Health came into force to focus

on governance, institutional development, public health, health services and human resources (28).

The government has shown the highest political commitment (2015) as a part of a renewed call to action for maternal and child survival through the Kabul Declaration. The Government made a new commitment to reduce stunting in children under 5 years of age to 35% by 2020 and 10% by 2030. Many public health strategies and policies have been developed by the government to mitigate the consequence of undernutrition in the Afghan population in the near future. (28,31). The Public Nutrition Strategy 2015–2020 is an effort aligned with global momentum for improving maternal and child nutrition; the nutrition strategy of the country focuses on the first thousand days from conception to 2 years of age through a combination of nutrition-sensitive and nutrition-specific approaches. The priority themes of the nutrition policy include: nutrition promotion, maternal nutrition, infant and young child feeding, micronutrients, adequate care during severe acute malnutrition, food safety and quality control, effective nutritional surveillance and monitoring, response to nutritional emergencies and capacity development for public nutrition and multisectoral coordination. (31). To achieve these priorities, a number of programmes and activities have been initiated (Table 2).

These programmes strive to achieve increased access to nutrition services and products, improved nutrition behaviour and practices, improved quality of nutrition services and products and a strengthened social, regulatory and political environment for nutrition. In addition, national standard operation procedures and guidelines were formulated to push the agenda forward through the health systems. These standard operation procedures and guidelines include infant and young child feeding, management of inpatient severe acute malnutrition, integrated management of acute malnutrition, nutrition in emergency, weekly iron folic acid supplementation, micronutrient supplementation and baby friendly hospital initiatives, etc. An elaborate multisectoral plan for the development and implementation of nutrition programmes across 5 government ministries, Public Health, Agriculture, Commerce, Education, and Rural Development, with clearly defined roles and responsibilities is also outlined in the strategy. Additionally, the formulation of several regulations (to protect breastfeeding and universal salt iodization) and the enactment of several nutrition-specific legislations (e.g. fortified food standards, supplementary and complementary food standards) illustrate the government's commitment to improving the nutrition situation of the Afghan people (31,32). A highly relevant policy framework generally helped in creating a positive environment for nutrition actions in Afghanistan. Basic building blocks for the scale-up of nutrition interventions are the BPHS and the EPHS.

Though, the nutrition policy framework aims to address nutrition challenges of populations with nutrition-specific and nutrition-sensitive interventions,

most BPHS and EPHS facilities are not able to provide a complete package of nutrition services. Implementation is often constrained by a shortage of human resources, low capacities of the workforce, lack of regular funding, a volatile security situation and a lack of demand for services (33,34).

Programme-based reporting and monitoring does take place, but the lack of a consistent monitoring and evaluation mechanism, the absence of standardized indicator definitions and few longitudinal nutrition surveys hamper the accumulation of sufficient evidence to show meaningful changes (22,29).

Additionally, the policy framework lacks the vision to address forthcoming nutrition challenges such as the rising burden of noncommunicable diseases, urbanization, climate change and changing dietary habits.

Public health nutrition workforce and capacity-building initiatives in Afghanistan

There is a growing consensus that a robust and knowledgeable workforce is essential for public health nutrition policy implementation. (35). The approaches to building the nutrition workforce are proposed in the nutrition policy, but the operational mechanism remains unclear. The main initiatives regarding capacity-development for public nutrition has been the establishment of the Public Nutrition Department within the Ministry of Public Health and the training of provincial nutrition officers. Provincial nutrition officers are responsible for coordinating and monitoring nutrition-related activities and training BPHS staff in nutrition services. The nutrition implementing partners report their activities according to the standard formats developed by the Public Nutrition Directorate. The progress of implementation activities is supervised by the nutrition officers of the implementing partner and the provincial nutrition officers at the provincial level (22,32)

Defining the human resource needs for 398 districts to deliver quality nutrition services across a large and diverse population scattered in the mountains and valleys is truly challenging. The shortage of trained human resource remains a major issue (14), most often as a result of the continuous and widespread insecurity, local customs, harsh climate, remote scattered location of the population, illiteracy and political pressures. Moreover, the continuing conflict has resulted in the displacement and migration of trained professionals from the country. Health professionals who are currently working in the health system have missed opportunities of continuing education and information on international developments in health care delivery, leadership and management. Recent research highlighted that about 70% of staff in Afghanistan do not meet minimum knowledge and skill standards (36,37). This calls for developing a well-trained public health nutrition cadre, schooled in the basic concepts and principles of public health nutrition as well as having been appropriately trained in the

Table 2 Nutrition programmes of Afghanistan

Programme	Partner agencies	Focus area	Target/indicators
Public nutrition in BPHS	Public Nutrition Directorate, Ministry of Public Health; World Bank; USAID; European Union	BPHS/EPHS, system strengthening, nutrition communication/ advocacy	Delivery of health nutrition services
Infant and young child feeding	Public Nutrition Directorate Ministry of Public Health; UNICEF; WHO	Breastfeeding & complementary feeding	Promoting and supporting early and exclusive breastfeeding until 6 months, among working mothers Early initiation of breastfeeding: >70%, exclusive breastfeeding: > 60% Promoting optimal complementary feeding with multi-micronutrient powders, or commercially produced fortified complementary foods > 40% coverage
Integrated management of acute malnutrition	Public Nutrition Directorate Ministry of Public Health; UNICEF; WHO	Management of severe acute malnutrition and moderate acute malnutrition	Integrated management of children < 5 years old (especially those < 24 months old) with severe acute malnutrition through in-patient and out-patient treatment > 70% coverage Early identification and supplementary feeding of < 5 year old children (with a special focus on < 2 year olds) with moderate acute malnutrition > 70% coverage
Micronutrient supplementation	Public Nutrition Directorate Ministry of Public Health, micronutrient initiative	Vitamins, vitamin D, iron, folic acid, calcium and zinc	Multi-micronutrient supplementation for non-pregnant adolescent girls and adult women > 60% coverage Semi-annual vitamin A supplementation for children 6–59 months > 95% coverage
Food Fortification	Public Nutrition Directorate Ministry of Public Health, World Food Programme, USAID	Iodine	Strengthening the existing mandatory salt iodization programme > 90% coverage Promulgating and enforcing mandatory law on fortification of industrially produced domestic and imported vegetable oil and ghee with vitamins A and D > 80% coverage
Food based dietary guidelines	Public Nutrition Directorate Ministry of Public Health, Food and Agriculture Organization	Dietary adequacy, nutrition education and behaviour change	Promoting use of national food based dietary guideline among families as well as other social institutions > 50% knowledge
Maternal nutrition	Public Nutrition Directorate Ministry of Public Health, World Food Programme	Nutrition during pregnancy	Supplementing food for pregnant and lactating women with undernutrition in food insecure area > 70% coverage Promoting balanced and micronutrients rich diet for pregnant and lactating women > 40% coverage
Nutrition surveillance	Public Nutrition Directorate Ministry of Public Health, Department of Foreign Affairs, Trade and Development Canada	Nutrition monitoring and surveillance	Improving the quality of the nutrition programme-related data through the health management information system Strengthening coordination with relevant units of the Ministry of Public Health toward routine monitoring and supportive supervision of nutrition services in by BPHS and EPHS facilities (including appropriate use of the basic score card and nutrition programme monitoring checklists)
Nutrition communication strategy	Public Nutrition Directorate Ministry of Public Health	Communication and behaviour change	Promoting proper nutrition and care during the first 1000 days of life, through mass communication and campaigns Strengthening the ability of maternal and child health care providers to deliver appropriate preventive and therapeutic food and nutrition messages to their patients

Sources: National health policy (2015–2020) (19); National nutrition strategy (2015–2020) (20); Standard operating procedure and guidelines for BPHS (22).

BPHS = basic package of health services.

EPHS = essential package of hospital services.

planning and management of large scale public health programmes (35,38).

Public health education is part of the medical curriculum offered by medical universities (39). No dedicated nutrition degree/diploma programme exists in the country. Hence, professionals hired to work in health facilities and in nongovernmental organizations to implement nutrition programmes lack professional nutrition qualifications and often do not meet minimum knowledge and skills (Table 3).

To carry out implementation activities, many nutrition training courses and workshops have been conducted to improve the skills and knowledge of the health care workers and other staff at central, provincial, district and community levels (Table 3). These short-term courses and workshops are limited and often do not cover the wider aspects relating to nutrition programmes and the wider public health aspects, including the planning, implementation and evaluation of public nutrition programmes. Moreover, training of dietitians to provide clinical nutrition services has still not been initiated.

Table 3 Current training protocols/programmes of health care workers in Afghanistan

Health worker	Requisite qualification for entry into job	Health facility level	Type of training	Trainings conducted/ planned
Health volunteer	Age 25–50 years from same community, preferred to be literate, be active and an influential person in the community	Community level	Community-based nutrition package	To be conducted in 10 provinces
Nursing & paramedical staff	Registered certificate of graduation from nursing or midwifery institutes	Facility level	Nutrition standard operation procedures guidelines	Conducted in most of the provinces
			Infant and young child feeding training	Conducted in some provinces
			Inpatient department – severe acute malnutrition management	Conducted in most of the provinces
Community health supervisor	At least to be high school graduate; having nursing and midwifery certificate is preferable	Facility level	Nutrition standard operating procedures guidelines	Conducted in most of the provinces
			Community-based nutrition package	To be conducted in 10 provinces
Doctor of Medicine (MD)	Having an MD degree issued by the Ministry of Public Health is a must	Facility level	Nutrition standard operation procedures guidelines	Conducted in most of the provinces
			infant and young child feeding guidelines	To be conducted if extra budget is available
			Inpatient department – severe acute malnutrition management	Conducted in most of the provinces
			Integrated management of acute malnutrition guideline	To be conducted if extra budget is available
Nutrition officers	MD degree issued by the Ministry of Public Health; work experience in the field of nutrition for at least 3 years; received necessary nutrition training; fluent in English and 2 local languages	Basic package of health services & nongovernmental organizations provincial level	Nutrition standard operation procedures guidelines	Conducted in most of the provinces
			Infant and young child feeding guidelines	To be conducted if extra budget is available
		In the structure of Provincial Public Health Directorate at provincial level	Inpatient department – severe acute malnutrition management	Conducted in most of the provinces
			Integrated management of acute malnutrition guideline	To be conducted if extra budget is available

Source: Public Nutrition Directorate, Ministry of Public Health, Afghanistan.

The Public Nutrition Directorate of the Ministry of Public Health is steering several initiatives to develop a public health nutrition cadre in the country. Diploma courses have been launched in Afghanistan with the help of development partners. One such initiative, supported by the Aga Khan Foundation, Afghanistan, with technical support from the Public Health Foundation of India, launched a blended diploma course in public health nutrition with a distance learning component combined with periodic mentoring. This diploma course piloted with 25 trained diploma holders. Several other initiatives are in the pipeline with support from the European Union and other partners. With this European Union support, the Public Nutrition Directorate also planned to establish a nutrition department within the structure of Kabul Medical University in Kabul city; this will incorporate nutrition as a separate subject in the curriculum of all health institutes in future.

Discussion

The current scenario offers both challenges and opportunities for public health nutrition in Afghanistan. It is evident from the review that despite the highest political commitment and an enabling policy environment, progress in the health and nutrition status of women and children remains challenging, with a very high burden of undernutrition among women and children and a rising burden of noncommunicable diseases. Poverty and food insecurity combined with underlying determinants such as poor hygiene and sanitation continue to pose major challenges to the nutritional status of mothers and children. In addition, ongoing conflicts and limited coverage of essential nutrition interventions further exacerbate the situation (19,24,26,40).

The review of the programme and policies highlighted that, with support from international organizations and the stewardship of the Public Nutrition Directorate at the Ministry of Public Health, the country was able

to progress on developing policies and strategies and provide an enabling policy environment. The highest political commitment with clearly laid-down policies, evidence-based goals and strategies paved the way for scaling up nutrition interventions in the country (23,31,32). The health service delivery system has been rebuilt based on the BPHS delivered by nongovernmental organizations through a contracting mechanism. This categorically helped increase access to and coverage of health services in remote areas (21,33,41). However, further progress would largely be influenced by the capacity of the system (governance, intersectoral and intrasectoral coordination and organizational arrangements, a robust monitoring mechanism, availability of a sufficient and qualified workforce) (42,43).

The availability of trained nutritional professionals is critical for further strengthening of the implementation of nutrition interventions in Afghanistan. A policy on the public health nutrition workforce with a defined structure, the requisite level of qualifications, occupational profiles and training at various levels could help in realizing the nutrition goals suggested in the revised nutrition strategy (2016–2020). Another important and unique challenge in this country with regard to the development of a nutrition workforce is the nonavailability of a university degree and diploma in nutrition. Developing technical collaboration and academic partnerships between governments, national, regional and international academic institutions and humanitarian/development/donor organizations to strengthen training and education institutes can address challenges resulting from the lack of an educational system. Moreover, modern programme delivery methods such as E-learning can be fostered to scale up training courses (39,44). E-learning could provide several options and would be suitable for different levels and settings and may help in building the core competencies of the existing workforce as well as for the new generation (39,45). It has been argued that distance learning alone may not be sufficient and can be challenging for learners due to language and other barriers (46). Moreover, the use of modern technology for education purposes is still not very common in Afghanistan; the lack of recognition further limits the use of distance learning. Therefore, a blended methodology (mix of both traditional and modern learning techniques) involving periodical mentoring by experts along with distance learning can be one of the approaches to addressing these issues.

The new Sustainable Development Goals era, where nutrition is linked to broader systems of health, food and the environment, offers the opportunity to reflect on how the nutrition capacity of professionals can be developed to promote systems thinking and support policies, research, programme planning, financing, and delivery of services (21,46). What should the nutrition training curriculum be? Recently, several requirements for developing the nutrition workforce have been identified, including leadership, ability to work in a multidisciplinary team, communication, advocacy and a set of technical skills (21,47). Standardization of the nutrition curriculum is vital for both in-service and pre-service training at different levels and aligning it with policy and programme priorities. Broadening the scope of nutrition training and integrating core nutrition competencies with broader systems of health, food and the environment in the nutrition curriculum can help in improving the implementation of nutrition actions in an intersectoral environment (48). Additionally, updated public health nutrition aspects should be integrated into the curriculum of medical and nursing studies (46). Developing an accreditation mechanism to review and recognize nutrition courses and training programmes as well as the accreditation of training institutes in collaboration with the Ministry of higher Education can help in setting up quality standards for the nutrition curriculum and training.

- To fill the evidence gap on the effectiveness of nutrition programmes in Afghanistan, investment in the implementation of research and a robust monitoring system should be prioritized.
- Efforts should be directed to address equity issues in the coverage of nutrition interventions.
- The policy framework required has to be aligned to deal with imminent nutrition challenges with the rising level of noncommunicable diseases and urbanization and changing dietary patterns.
- Developing a nutrition workforce strategy within the definitive structure of the public health nutrition workforce can be useful to streamline the workforce distribution towards providing preventive as well as therapeutic nutrition services, and make the field of nutrition an attractive career choice.
- A centre for excellence in public health nutrition to lead nutrition education and research initiatives in therapeutic and prevention nutrition can help narrow any gaps in research and academic activities.

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Nutrition de santé publique en Afghanistan – politiques, stratégies et renforcement des capacités : scénario actuel et initiatives

Résumé

Contexte : L'Afghanistan est confronté à un lourd fardeau de malnutrition chez les femmes et les enfants et à une charge croissante de maladies non transmissibles.

Objectifs : Un examen narratif a été mené afin de cartographier les politiques de nutrition actuelles et les initiatives de développement des capacités afin d'évaluer la politique et l'environnement institutionnel et d'identifier les lacunes et les opportunités.

Méthodes : Une recherche complète et large a été menée, y compris sur des bases de données, des sites web et des documents de politique et de programme.

Résultats : La politique est axée sur les efforts multisectoriels pour relever les défis en matière de nutrition ; toutefois, la mise en œuvre d'interventions spécifiques et sensibles à la nutrition n'est pas réalisée de manière uniforme au niveau communautaire en raison de la persistance des situations de conflit et de l'inaccessibilité géographique, du manque de disponibilité de ressources humaines formées et de la faiblesse des institutions. Il existe peu de bases factuelles sur l'efficacité de programmes de nutrition en Afghanistan. Des dispositions politiques limitées sont disponibles pour traiter les problèmes de nutrition dus à la charge croissante des maladies non transmissibles, à l'urbanisation et à l'évolution des habitudes alimentaires. La pénurie de professionnels de la nutrition compétents est un problème critique. Le manque de capacités institutionnelles, de normes éducatives et de mécanismes d'accréditation constitue un défi majeur. Les programmes de formation actuels sont fragmentés et ne répondent pas aux exigences du personnel professionnel de la nutrition.

Conclusion : Les résultats de l'étude mettent en évidence le fait que des politiques et des stratégies bien structurées axées sur la nutrition chez la mère et l'enfant fournissent un environnement politique favorable à l'intensification des interventions nutritionnelles. Les bases factuelles sur la mise en œuvre des programmes sont nécessaires pour aider à formuler des recommandations politiques. Le manque de mécanisme institutionnel pour l'éducation professionnelle en matière de nutrition souligne le grand besoin d'action en faveur de la nutrition et l'éducation en santé publique en Afghanistan.

التغذية في مجال الصحة العامة في أفغانستان: السياسات والاستراتيجيات وبناء القدرات: السيناريو الحالي والمبادرات

جيوتي شارما، هومايون لودين، مونیکا شوهان، سانجاي زودبي

الخلاصة

الخلفية: تواجه أفغانستان عبئاً ثقیلاً بسبب سوء التغذية بين النساء والأطفال، وعبئاً متزايداً بسبب الأمراض غير السارية.

الأهداف: هدفت هذه الدراسة إلى إجراء استعراض سردي لتوصيف سياسات التغذية الحالية ومبادرات تنمية القدرات، لتقييم السياسات والبيئة المؤسسية وتحديد الثغرات والفرص.

طرق البحث: أُجري بحث شامل وواسع النطاق يشمل قواعد البيانات والمواقع الإلكترونية ووثائق السياسات والبرامج.

النتائج: تركزت السياسات على الجهود المتعددة القطاعات للتصدي للتحديات المتعلقة بالتغذية؛ غير أن تنفيذ التدخلات الخاصة بالتغذية والمراعية لها لا يتم على نحو موحد على مستوى المجتمع، بسبب حالات النزاع المستمر وعدم إمكانية الوصول الجغرافي وعدم توافر الموارد البشرية المدربة وضعف المؤسسات. وهناك دلائل محدودة على فعالية برامج التغذية في أفغانستان. وهناك نصوص محدودة في السياسات لمعالجة مشكلات التغذية الناجمة عن العبء المتزايد للأمراض غير السارية والتوسع الحضري وتغير الأنماط الغذائية. ويُمثل النقص في أخصائيي التغذية الماهرين مشكلة بالغة الأهمية. ويُشكل الافتقار إلى القدرة المؤسسية والمعايير التعليمية وآلية الاعتماد تحديات كبيرة. كما أن برامج التدريب المستمر تعاني من التفتت، ولا تلبي متطلبات القوى العاملة لأخصائيي التغذية.

الاستنتاج: توضح النتائج أن السياسات والاستراتيجيات المهيكلية جيداً التي تركز على تغذية الأمهات والأطفال توفر بيئة سياساتية تمكينية لزيادة تدخلات التغذية. ويلزم توفير دلائل على تنفيذ البرامج للمساعدة في وضع التوصيات المتعلقة بالسياسات. ويعكس عدم توافر آلية مؤسسية للتثقيف المهني في مجال التغذية الحاجة الماسة لاتخاذ إجراءات في أفغانستان من أجل التغلب على التثقيف في مجال الصحة العامة.

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Regional consultation meeting on the Global Initiative for Childhood Cancer¹

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Introduction

Cancer is a leading cause of death for children, with almost 400 000 new cases diagnosed globally (1) and 33 800 new cases estimated among children aged 0–14 years in the Eastern Mediterranean Region in 2020 (1). Although childhood cancer is curable for the majority of children when essential diagnostic, therapeutic and supportive care services are accessible, profound inequalities in access and outcomes exist within and between countries, leading to as few as 20–30% of children living in low- and middle-income countries surviving (2).

In September 2018, the World Health Organization (WHO) announced the launch of the WHO Global Initiative for Childhood Cancer (GICC) (3) following a series of meetings after the recognition by Member States, WHO and partners of the need to increase the prioritization of childhood cancer in order to transform health systems and reduce mortality related to noncommunicable diseases (NCDs). Through this initiative, WHO will support governments in assessing current capacities in cancer diagnosis and treatment, and in integrating childhood cancer into national strategies, health benefits packages and social insurance schemes. The goal of the initiative is to reach a global survival rate of at least 60% by 2030 (3), while reducing suffering and improving the quality of life for children by increasing the prioritization of childhood cancer nationally, regionally and globally; and expanding the capacity of countries to provide quality childhood cancer care.

To discuss an appropriate regional governance structure for the initiative and identify suitable modes of regional collaboration for the successful implementation of the GICC in the Region, a regional consultation meeting was held virtually during 25–26 January 2021 (4). The meeting was attended by over 100 participants, including representatives from 19 ministries of health from the Region, paediatric oncologists, and representatives of global and regional paediatric oncology associations, UN agencies, and other global, regional and national partners in childhood cancer care, as well as the three levels of WHO.

The objectives of the meeting were to:

- provide Member States with updated information on the GICC and the CureAll technical package (5);
- assess the regional childhood cancer situation based on regional modelling estimates and rapid over-

views of national capacity and childhood cancer programmes in the Region;

- identify and agree on a possible regional governance structure and partnership model to support the roll out of the GICC in the Region; and
- discuss and agree on a stepwise approach to roll out the GICC in the Region.

Summary of discussion

The GICC and CureAll technical package present an opportunity for governments to better plan and integrate childhood cancer programmes at a national level. Strong political commitment will be necessary for the success and sustainability of the initiative. Furthermore, the Eastern Mediterranean Region is frequently affected by emergencies, making it crucial to find a means of not only strengthening health systems in normal situations, but maintaining access to services under emergency situations. Building and delivering high-quality care for children with cancer requires multi-agency support and strong multidisciplinary services. There is a multitude of partners already active in the Region that can support the GICC, necessitating a regional governance structure to foster collaboration between partners, under the leadership of WHO.

Recommendations

To WHO

- Implementing regional stakeholder mapping to determine potential engagement and scope of activities;
- holding virtual consultations on a regional governance structure and partnership model for the GICC;
- implementing a situation analysis of the status of childhood cancer in the Region using adapted CureAll assessment tools; and
- developing and disseminating a Call for Proposals for projects that address barriers to childhood cancer care,

To Member States

- Supporting the development/scaling up of national childhood cancer programmes; and
- implementing CureAll campaigns.

¹ This summary is extracted from the report on the Regional consultation meeting on the Global Initiative for Childhood Cancer, virtual meeting, 25–26 January, 2021 (<https://applications.emro.who.int/docs/WHOEMNCD148E-eng.pdf?ua=1>).

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