The COVID-19 pandemic has received massive coverage and comment on social media platforms. This 'infodemic' has also given rise to the problem of misinformation that actually hinders the dissemination of effective and concise factual content on ways to prevent and treat COVID-19, leading to issues of vaccine hesitancy, self-medication and non-observance of social distancing measures. As a result, governments and relevant agencies need to add special focus on monitoring and tackling the problem of medical misinformation among the public.

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Addressing violence against women in the Eastern Mediterranean Region

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New estimates from the World Health Organization (WHO) indicate that about 1 in 3 women globally will face gender-based violence in their lifetime. The WHO Eastern Mediterranean Region has the third-highest prevalence of violence against women worldwide, with 31% of ever-partnered women experiencing physical and/or sexual intimate partner violence at some point in their lives (1). Specific groups of women and girls, such as migrants and undocumented workers, women with disabilities, and women affected by armed conflict or in emergency settings are more vulnerable and may experience multiple forms of violence (2). Health emergencies, as demonstrated during the current COVID-19 pandemic, may also increase the risk of violence against women (3).

Violence is a risk factor for poor health in women, with profound effects on their sexual, reproductive, and mental health and wellbeing (4,5). The documented short- and long-term health impacts of violence reveal how significant a public health problem it is, leading to a broad array of adverse outcomes and resulting in overall social and economic costs for countries (2).

In response, WHO and Member States committed to scaling up the prevention of and response to violence against women through Resolution WHA67.15 (6) and the consequent Global Plan of Action (7). In the framework of the 13th General Programme of Work 2019-2023 (GPW13) and the Regional Vision 2023 (8), WHO set a clear target to reduce such violence. These commitments resonate with related targets of Sustainable Development Goals 5 and 16.

In the Eastern Mediterranean Region, many efforts have been undertaken to translate these global mandates into actions so that health systems can fulfill their expected role to prevent and respond to violence against women, within a broader multisectoral approach. In this regard, WHO has been providing technical guidance to countries for developing appropriate policies and tools to deliver timely, quality and compassionate health care for survivors of violence. This focused approach led to scaling up of WHO's technical support and direct work on violence against women in 11 countries in the Region.

Since 2019, over 5000 health-care providers in Afghanistan, Iraq, Libya, Pakistan, Palestine, Somalia, Sudan and the Syrian Arab Republic have completed interagency trainings on clinical management of rape and intimate partner violence (CMR/IPV) (9), mental health and psychosocial support for survivors. In addition, approximately 700 health facilities in Afghanistan and Pakistan have been equipped to provide safe care to survivors. Furthermore, to improve data collection WHO supported quality assessments of health facilities in Iraq, Morocco and Sudan. The main gaps identified by these assessments included the lack of trained staff and CMR equipment, as well as data collection and referral pathways. At the policy level, WHO supported the development, update and endorsement of national health policies and guidelines in Afghanistan, Egypt, Iraq and Pakistan. Participatory awareness raising campaigns and initiatives are also conducted in countries in emergency, particularly in the Syrian Arab Republic, and hard to-reach areas in collaboration with local stakeholders and communities. Key messages highlight violence against women prevention, health services for women survivors of violence and linkages with other services.

The COVID-19 pandemic and the consequent measures to control the spread of the virus has also brought about an increase in domestic violence (3,10). Available information from women's organizations and hotlines indicate an increase in cases by 50–60% in the Region during the first lockdown, compared to 2019 data (11). This implies that despite existing challenges, survivors continued to resort to health services as the most accessible and sometimes the only available services. To document health service availability and utilization by gender-based violence survivors in the context of COVID-19, WHO and Health Clusters conducted rapid assessments in Afghanistan, Iraq and Somalia. The findings indicated an increase in health service utilization by survivors, particularly women enduring intimate partner violence, by nearly 40% (12).

Much work has been done and many achievements were accomplished in the Region. However, much more is still required. There is a clear need to increase key stakeholders' awareness about the importance to integrate violence against women within health systems in a sustainable manner, through developing appropriate policies and guidelines; to continue strengthening healthcare providers capacity; and to generate evidence and knowledge to support undertaken actions.

The role of health in addressing violence against

women, within a broader multisectoral response, is crucial. The health system is a socially and culturally accepted and trusted entry point. Health-care providers are, at many times, the first point of professional contact for survivors. It is therefore imperative to scale up ongoing efforts and strengthen investment in combating such violence as a health system priority, both in development and emergency contexts in the Region and globally.

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Efforts to deploy COVID-19 vaccine in the WHO Eastern Mediterranean Region within the first 100 days of 2021

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Introduction

Soon after the beginning of the COVID-19 pandemic (*1*), the World Health Organization (WHO), its global partners and Member States initiated a race towards the development and deployment of vaccines. In February 2020, WHO convened the first research meeting to discuss the new virus and ways to accelerate research priorities, including vaccine development (*2*). Public and private sectors joined hands in global cooperation for vaccine research and the efforts have paid off. Since June 2020, phase III randomized controlled trials of different vaccine candidates were underway around the world, including in several countries of the WHO Eastern Mediterranean Region (EMR). By November 2020, there were early reports of candidate vaccines' safety and efficacy, followed by peer-reviewed publications (*3,4*). Historically, this is unprecedented in the record time it has taken for effective vaccine development, and efforts are still ongoing. As of April 2021, there were at least 85 vaccines under clinical study, of which 28 had reached Phase III randomized controlled trials (*5*). Overall, multiple vaccine candidates have proven to be safe and effective (*6–10*).

In September 2020, WHO joined forces with Gavi the Vaccine Alliance and the Coalition for Epidemic Preparedness Innovations (CEPI) to create the COVAX Facility (*11*). COVAX aims to facilitate access to vaccines for all countries. Globally, 57 low- and middle-income countries are eligible for Gavi support. These, and an additional 35 middle-income countries, are eligible to access COVID-19 vaccines through the COVAX Advance Market Commitment (AMC). The AMC is a legally binding agreement for a fund amount to subsidize the purchase of a currently unavailable vaccine (*12*). Overall, 92 countries are eligible to this innovative financing mechanism that accelerates the global rollout of vaccines. High income and upper middle-income countries (World Bank country classifications by income level, 2020) can also access COVID-19 vaccines from the COVAX facility as Fully Self-Financing (FSF) participants (*13*). On 27 September 2020, the WHO Strategic Advisory Group of Experts on Immunization (SAGE) recommended prioritizing initial vaccine use for the 20% of each country's population most vulnerable to severe disease and those at highest risk (*14*).

In December 2020, amid an increase in cases partly due to the emergence of variants of concern (*15,16*), high-income countries started immunization programmes using vaccines procured through bilateral agreements. The COVAX Facility followed rapidly to allocate vaccines, starting with AMC countries (*16*). In January 2021, the WHO Director General pledged to introduce COVID-19 vaccines in all countries by the first 100 days of 2021 (i.e., by 12 April 2021), soon after World Health Day (7 April 2021). This article summarizes the regional efforts to fulfill this initial pledge towards the larger goal of vaccinating 20% of a country's population by the end of 2021.

Vaccine rollout and COVAX

The WHO Regional Office for the Eastern Mediterranean Region (EMRO) added a vaccine pillar to its COVID-19 Incident Management Support Team (IMST) (*1*), and reached out to the United Nations Children's Fund (UNICEF) and other partners to form a regional working group. EMRO supported countries through all steps of the COVAX allocation process, including (1) readiness assessment; (2) preparation of a National Deployment and Vaccination Plan (NDVP); (3) vaccine requests; (4) national emergency use authorization; (5) import license; and (6) indemnification and liability agreements. EMRO monitored country reports sent to WHO, purchase orders issued through COVAX, bilateral agreements officially announced, official internet sites of ministries of health, and press announcements. Progress was tracked at the global level for vaccines obtaining the necessary WHO emergency use listing; and at country level for the various steps of the allocation process and initiation of vaccination.

Vaccination coverage and monitoring of adverse events following immunization (AEFI)

A system was initiated to collect and report vaccine use data to WHO, monitor online sources of information

(e.g., Our World in Data, Bloomberg), and centralize sources of information on vaccine coverage. A dashboard was created to visualize vaccine and regional data. Data were reviewed and analyzed on AEFI that had been reported through the Programme for international Drug Monitoring and the Uppsala Monitoring Centre. In addition, countries also shared adverse event data directly with WHO.

Results

All 22 EMR countries participated in COVAX, including 11 FSF countries and 11 AMC-supported countries, of which seven were Gavi eligible. A first wave of high-income EMR countries had initiated vaccinations from 14 December 2020 (Figure 1) and was followed by middle-income countries in January 2021. On 3 March 2021, Sudan received the first COVAX shipment in the Region; by 21 April 2021 all EMR countries had received vaccines and had started vaccination programmes. As of 21 April 2021, WHO has listed four vaccines (Comirnaty from Pfizer BioNtech, Covishield and Vaxzevria from AstraZeneca, and Janssen from Johnson and Johnson) for emergency use. By 28 February 2021, all EMR countries had been provided with emergency use authorization for at least one COVID-19 vaccine. As of 21 April 2021, the 22 national regulatory authorities in the Region had also given emergency use authorization for a number of vaccines, including Covishield and Vaxzevria (*n*=22), Sputnik V (*n*=14), Comirnaty (*n*=11), Sinopharm, (*n*=11), Janssen (*n*=4), Coronavac (*n*=2), Convidicea (*n*=1) and Covaxin (*n*=1).

As of 21 April 2021, global monitoring sources indicated that 33.4 million doses had been administered in 21 countries in the Region (Figure 2). Meanwhile, only 21.4 million (64% of total administered) doses had been

reported to WHO. The median ratio of doses administered by population was 5/100 population overall; the highest ratios were in the United Arab Emirates (98/100) and Morocco (24/100, Figure 3).

As of 21 April 2021, 12 393 cases of adverse effects were reported to the WHO global data base (Vigibase) of the WHO Programme for international Drug Monitoring, developed and maintained by the Uppsala Monitoring Centre (WHO Collaborating Centre); of these, 1.9% were serious. Females accounted for 55.2% of cases and the median age class was 45–64 years. The AstraZeneca vaccines accounted for the largest proportion of AEFI (74.3%, respectively). The majority of vaccine-related adverse effects were mild and related to general disorders and administration site conditions. The four most common adverse effects were headache (23.4%), fatigue (21.4%), asthenia (21.3%) and pyrexia (19.8%).

Discussion

All the EMR countries have managed to deploy vaccines and initiate vaccination programmes against COVID-19 at an unprecedented rate – by the 111th day of 2021. This achievement was made possible through a systematic approach that ensured solid national plans, predicted needs, engaged national regulatory authorities and strengthened logistics. All these interventions have the potential to strengthen immunization systems in the long term.

At least seven countries of the Region have participated in randomized clinical trials that have contributed to the development of COVID-19 vaccines. A number of studies are still ongoing and further efforts should be devoted to vaccine effectiveness studies and Phase IV randomized controlled trials (*6*). Such capacities not only enhance the knowledge needed for continuous response to the

Figure 1 **Number of countries of the Eastern Mediterranean Region having initiated vaccination against COVID-19 by two-week intervals, December 2020–April 2021**
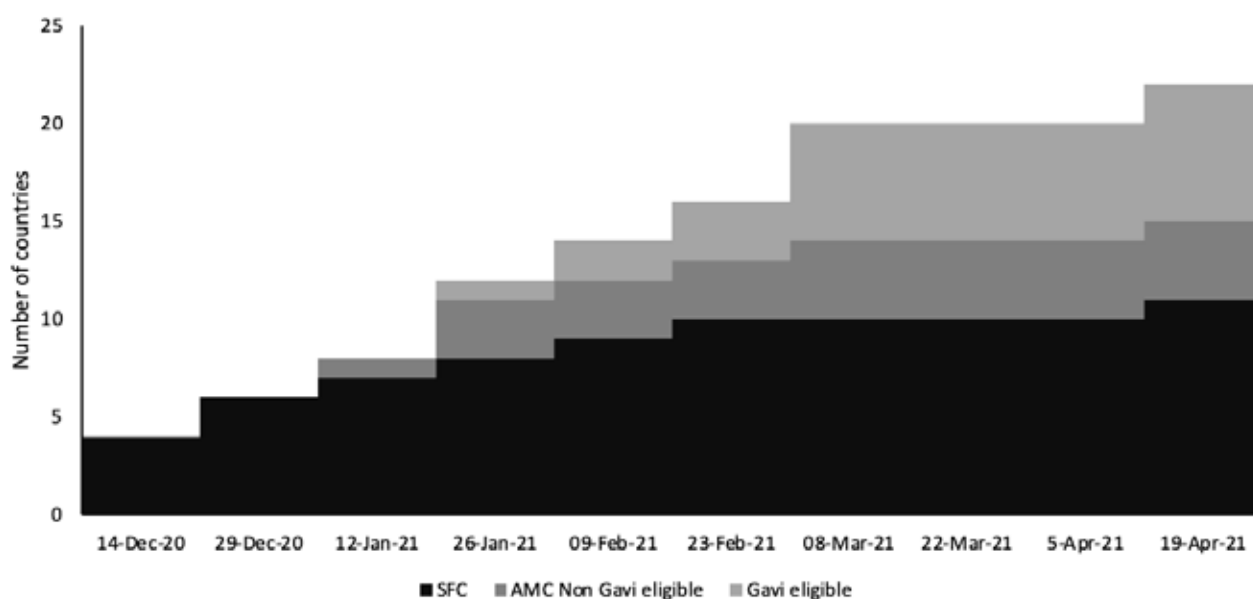
Figure 2 Number of vaccine doses used in selected countries of the Eastern Mediterranean Region according to global sources of information and WHO reports, December 2020–April 21, 2021
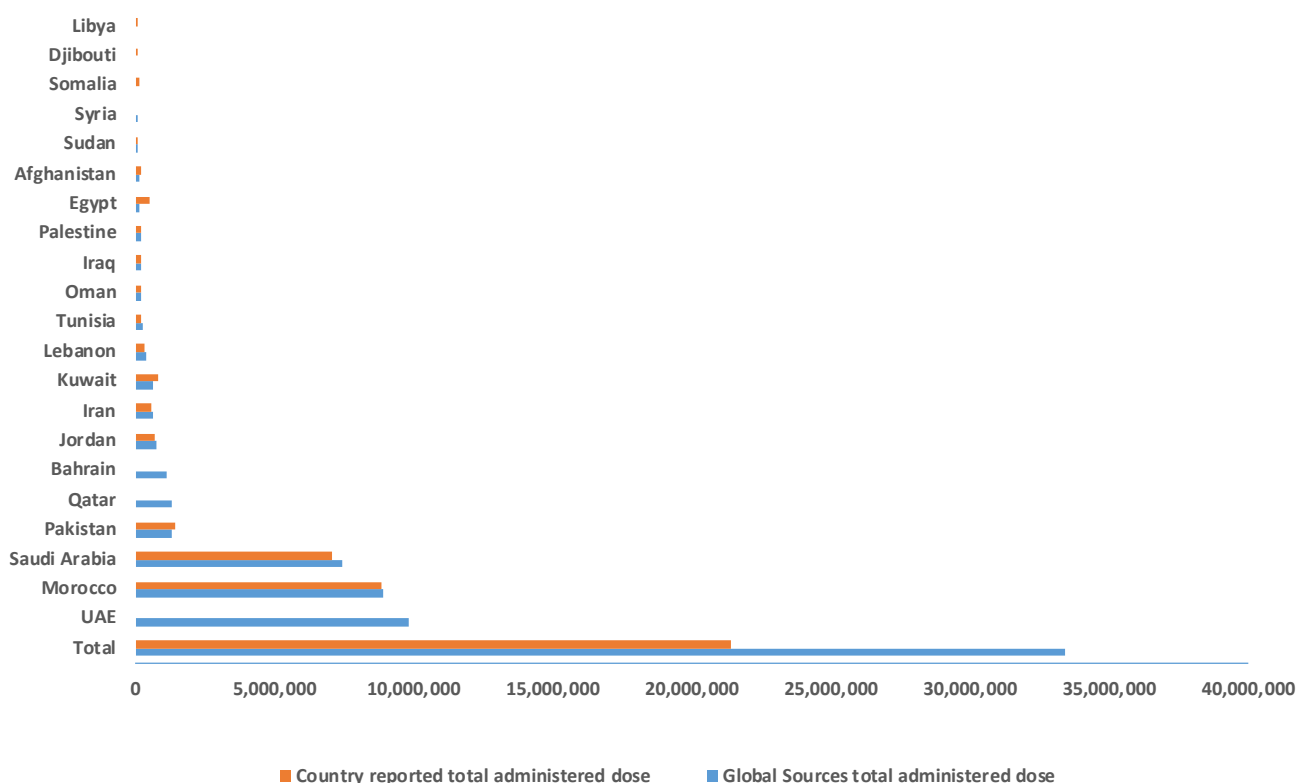
COVID-19 pandemic, but will also enhance the knowledge base for vaccine research in the Region beyond the COVID-19 response.

Vaccine deployment in the Region has reflected regional differences in capacities and resources. High-income countries have vaccinated first, while middle-income countries followed rapidly, including bilateral agreements for the use of vaccines from China and Russia. The COVAX facility distributed its first vaccine in the Region approximately two months after the first EMR country started vaccination. This opened the way for deployment of the vaccine in low-income, Gavi-eligible countries that could not have afforded it otherwise, as well as in countries experiencing humanitarian emergencies.

Reported data pointed to a larger use of vaccine in countries of the Region with stronger health systems and substantial resources. However, Morocco – a middle-income country – constituted an exception after having administered doses to approximately 25% of the total population by 21 April 2021. Unfortunately, for most countries the data were not available for WHO to capture actual coverage by target groups. Information was often missing on the number of different high-risk and vulnerable population groups and on the characteristics of the vaccine recipients, e.g. age, sex, persons with comorbidities, professions, etc. In addition, vaccination coverage data among vulnerable population groups (e.g., refugees, migrants and people experiencing emergencies or humanitarian situations [7,8]) were not available in

most countries. The COVAX allocation process based on equality within the context of heterogeneous epidemiological situations also represented a challenge in the Region.

Historically, vaccines have had high acceptance in the Region (9). However, the COVID-19 pandemic was characterized by the rise of 'infodemics' (10) and the spread of misinformation. Selected surveys in 13 EMR countries reported evidence of hesitancy to take COVID-19 vaccines (17–19); the highest being in Egypt, Iraq, Jordan and Tunisia, and the lowest in Afghanistan, Morocco and United Arab Emirates. Providing clear and consistent information, building trust and transparency around the vaccine's development and distribution will improve uptake. Securing broader demand will be key to its long-term success, even if it is not critical in the initial phase of the deployment.

Adverse Events Following Immunization (AEFI) surveillance in the Region supports the hypothesis that COVID-19 vaccines are safe, even though large clinical trials had not captured a number of rare adverse events that were only detected through post-marketing surveillance (10). Thus, vaccine safety systems in the Region need to be further strengthened to monitor safety more closely, particularly in contexts where vaccinated persons are older or with pre-existing conditions.

Conclusions and recommendations

Unprecedented speed in vaccine development and de-

Figure 3 COVID-19 vaccine doses administered per 100 population in Eastern Mediterranean Countries, 18 April 2021
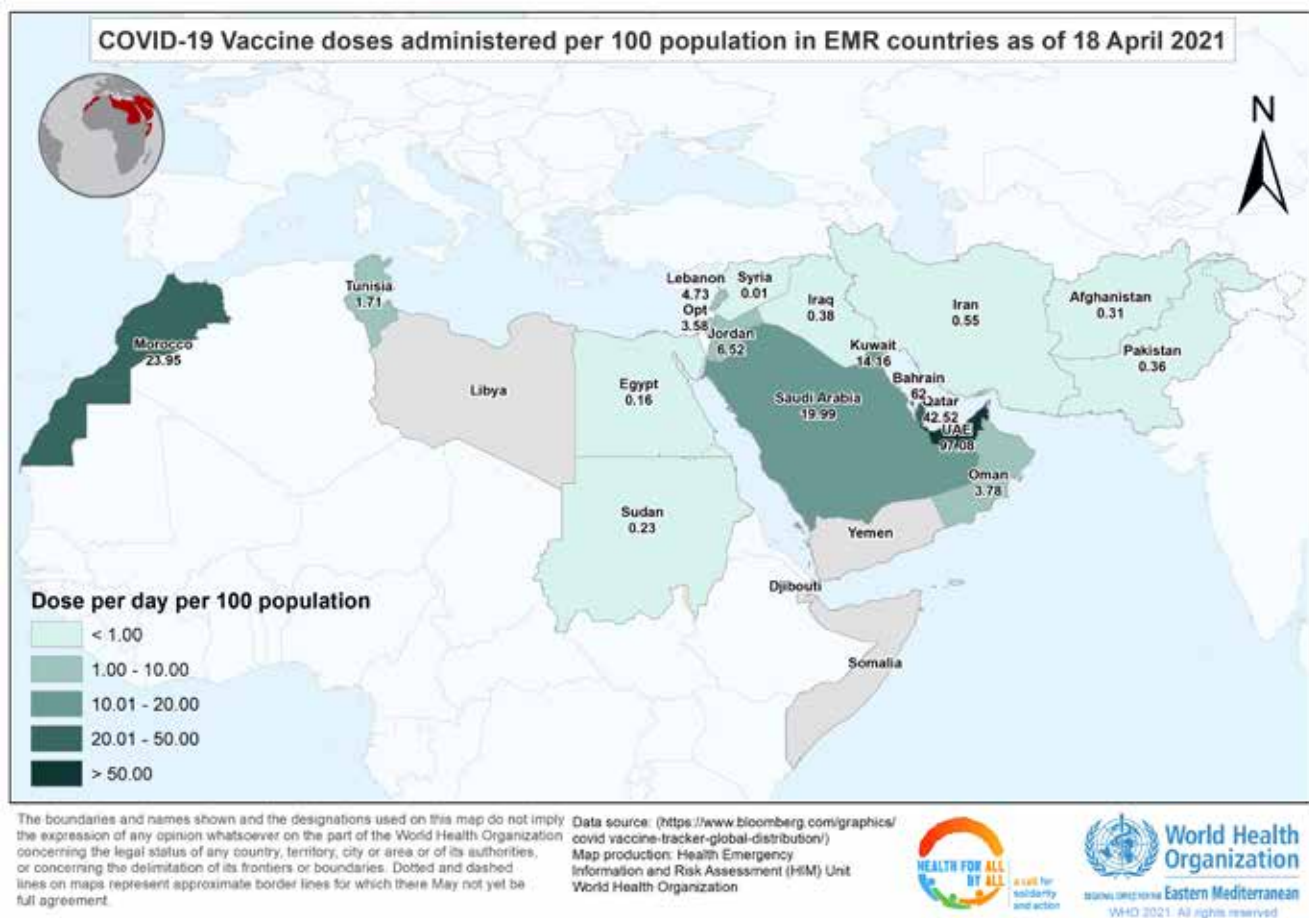
ployment has led to the introduction of COVID-19 vaccines in all 22 EMR countries by 21 April 2021. In addition, the COVAX Facility successfully secured access to low-income countries and countries in emergencies. Vaccination programmes often started well with healthcare workers, but as of 21 April 2021, uptake still remained low and unequal across countries. Vaccine acceptance rates need to be monitored even though no major safety signals have been detected in the Region. Going forward, EMRO remains mobilized to building on this important start. Since no-one will be safe until everyone is safe, we need to increase coverage in an equitable manner across countries. Marginalized and underprivileged communities, including refugees, migrants and people living in humanitarian settings, are to be included in the national vaccination plan in accordance with SAGE recommendations. In addition, we need to build trust in populations to support community engagement, including strengthening our vaccine safety systems. These efforts should contribute to the achievement of the goal of ending the acute phase of the pandemic by the end of 2021, while establishing a platform for implementing a life-course approach to adult immunization – a priority of the Immunization Agenda 2030 (11).

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Infodemic, self-medication and stockpiling: a worrying combination

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Introduction

Self-medication is the practice of selecting and administering drugs to oneself or family without a physician's prescription or consulting a doctor in case of minor illnesses or self-diagnosed conditions (1). Families, friends, neighbours, pharmacists, previous drug prescriptions, opinions formed from advertisements in newspapers, popular magazines and social media are the most common sources of self-medication in low and middle-income countries in the Eastern Mediterranean Region (2-4).This practice more often causes increased tolerance to antibiotics and other subsequent health issues such as pathogen resistance, increased morbidity and inappropriate treatment (5). Some common antibiotic-resistant microorganisms include methicillin-resistant *Staphylococcus aureus* (MRSA), glycopeptide-resistant *S. aureus*, and toxin hyperproducing *Clostridium difficile.* In addition, amoxicillin, macrolides, fluoroquinolones, cephalosporins and metronidazole drugs are the most common antibiotics used for self-medication. For example, irrational usage of amoxicillin may have adverse effects such as medication tolerance and nil response to treatment in acute otitis media, pneumonia, and urinary tract infections where amoxicillin is considered as a first-line antibiotic (6).

Self-medication and COVID-19

The spread of COVID-19 has galvanized researchers to find an effective treatment as well as developing a vaccine. Hydroxychloroquine, azithromycin, ivermectin, remdesivir, chlorine dioxide and lopinavir are among a number of drugs that appear useful for the treatment of COVID-19 (Table 1). However, randomized clinical trials are required to build an evidence-based treatment for COVID-19 (7). Recently, dexamethasone proved to be a very instrumental addition with the drug proving vital for hospitalized patients on respiratory support (8).

The information available online may pose dangers to public health and the array of possible treatments shared on social media can encourage a greater tendency to self-medicate by the general public. In addition, the misinformation online may have initiated a wave of the virus in the first place as people were not provided with the correct protocols and measures to control its spread (9). Many are sceptical about visiting hospitals for COVID-19 tests; since the public relies on the internet and social media to obtain sensitive information regarding the management of coronavirus, they are very likely to end up with misleading information. Thus, there has been a marked increase in the number of people searching online to self-medicate during this pandemic (10).

For chloroquine in adults, the lethal dose is estimated to be between 30 and 50 mg/kg, while doses higher than 20 mg/kg can also be toxic (11). These dosages can highly vary in older patients and those having comorbidities, especially cardiac issues. Many observational studies concluded that the usage of hydroxychloroquine, chloroquine and/or azithromycin were associated with QT prolongation and any need for usage must outweigh potential adverse effects (12). The use of these drugs is purely case based and cannot be done without a registered medical practitioner (13). Reports in Nigeria claimed that three people had overdosed on chloroquine after claims on social media about the efficacy of the drug (14). Similarly, ivermectin can result in serious consequences in pregnant women and in patients suffering from meningitis (15). In addition, the use of dexamethasone in

Table 1 Commonly self-prescribed drugs for COVID-19

Drugs	Possible side effects
Hydroxychloroquine	• QT prol ongation
Chloroquine	• QT prolongation
	• Low blood pressure
Azithromycin	• QT prolongation
	• Gastrointestinal symptoms
Ivermectin	• Allergic reactions
	• Central nervous system effects
Chlorine dioxide	• Respiratory failure
	• Acute liver failure
	• QT prolongation
Steroids	• Leads to a suppressed immune system causing worsening of COVID infection if taken in initial stages
	• Can trigger diabetes
	• Cataract
	• Insomnia
	• Cushing syndrome

asymptomatic or mildly symptomatic patients can cause deteriorating effects; the drug proved to have no effect on patients without respiratory support and the undue use of steroids is associated with complications (*2*).

Another area of concern with regard to self-medication is stockpiling, which leads to a shortage of these very necessary drugs in the market. Drugs that are certified for COVID-19 treatment have several proven uses and stockpiling these leaves many people devoid of these essential medications. For instance, chloroquine is used to treat malaria and many autoimmune diseases that include systemic lupus erythematosus and inflammatory arthritis (*16*). The scarcity of life-saving medications gives rise to increased expenses, patient harm, and increased errors by health workers, causing widespread apprehension in oncology, infectious disease, critical care, and many other settings (*17*). Hence, stockpiling deprives patients of their necessary medications and limits treatment in the context of this pandemic.

What can be done?

Strict regulations need to be imposed to prevent stockpiling of essential medicines. Health professionals need to educate the general public; proper health education can significantly affect the views held by people, which in turn can have a positive influence on their family members and friends. Governments should develop strategies to regulate information regarding possible medications on the internet and further research to pinpoint the platforms dissipating misinformation. In addition, there should be improvement in the workflow in pharmacies, strict control regarding pharmaceutical advertisements, and improved communication between pharmacists and clinical teams on how supplies may affect health-care delivery.

Conclusion

The COVID-19 pandemic has given the practice of self-medication a new impetus that is supported by social media platforms, which actually hinder effective and concise information on ways to prevent and treat COVID-19. The knock-on effect of drug stockpiling needs to be addressed so that medicines can effectively reach the most vulnerable; this requires the implementation of stringent laws and policies by governments to prevent easy availability of over-the-counter drugs. In particular, governments need to add special focus on monitoring and tackling the problem of medical misinformation among the public.

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Prevalence of abuse against frontline health-care workers during the COVID-19 pandemic in low and middle-income countries

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As of 20 April 2021, 142 752 087 cases of COVID-19 and 3 044 553 deaths have been reported globally (1). The outbreak has affected multiple sectors worldwide; however, the health-care sector remains the most heavily impacted. In spite of this pandemic reminding the general population of the heroism of health-care workers, it has stirred an upsurge in acts of violence against them and places health-care workers in extraordinarily overwhelming settings where they are not only coping with the fear of contracting the virus and of passing it to their family and friends, but also the fear of abuse.

In light of the substantial dissemination of COVID-19, many instances of COVID-19 related acts of violence may have reached a pandemic level. For the sake of continued health-care worker functionality, a pressing priority is that any individual or entity committing an abusive act must be closely monitored, confronted, and lawfully apprehended if necessary.

Emerging patterns of violence and abuse occurring in health facilities, ambulances, and against staff have been recorded globally with a specific tendency to occur in low- and middle-income countries (2). Such incidences of violence frequently happen when efforts by health-care professionals are made to apply certain essential, yet unpopular, COVID-19 control measures, such as keeping a family member in an isolation centre, not authorizing the family to touch the body of a deceased loved one, or to be in close proximity to a critically ill or dying patient. In addition, health-care workers have found themselves shut out of their residences by neighbours fearful of COVID-19 infection (3).

Alongside verbal threats, incidences of abuse have also manifested physically. Examples include villagers in Egypt prohibiting the funeral of a doctor who died of COVID-19 (4); and health-care workers in quarantine facilities suffering multiple forms of violence in the Syrian Arab Republic (5).

Stressful hospital settings are considered a primary cause for violence against health-care workers, inducing an oppressive atmosphere of fear among family members (6). However, questions remain about the underlying causes behind the predominance of such abusive incidences in low- and middle-income countries. A partial explanation could be the lack of communication skills training for health-care workers to handle such tense situations, particularly when the family of a patient are unable to grieve the loss of their loved one or even to be counselled effectively. Good communication between doctors and their families on the one hand, and health-care workers (such as nurses and paramedics) on the other, has been shown to greatly improve the hospital environment by promoting a more relaxed and direct relationship between all parties concerned. However, an unbalanced relationship between the patient and medical staff can lead to a sense of reduced patient autonomy in care decision-making, negatively affecting the whole care process output (7).

In addition, a weak doctor-patient relationship may also inadvertently contribute to distrust and abusive acts towards other health-care workers. Deteriorating socioeconomic factors in certain low-and middle-income countries, such as a low doctor-patient ratio, has meant many physicians have less opportunity to build a good rapport with patients (8). A comparative examination of population demographics may help further explain reasons behind increased violence against health-care workers in such countries. However, in a measure to protect health-care workers, many countries have passed legislation to protect such essential staff from violent incidences during the course of their duties.

Research has suggested that increased levels of violence against health-care workers correspond to a demographic where education rates are significantly lower than higher-income countries (9). Moreover, poor health-care delivery systems in the public sector can also be considered a relevant factor in violence against health-care workers when considering 91% of such cases of abuse took place in governmental health-care systems (10). A recent study highlighted the significant correlation between health-care workers' exposure to violence and the level of hospital care, whereby any shortage of staff combined with an increasing workload results in a higher probability of burnout, which again could lead to deteriorating relationships with patients (11).

Health inequity has been an ongoing challenge for low- and middle-income countries, particularly during the COVID-19 pandemic, where health-care systems

are struggling to provide basic support to patients and protection to health-care workers. This may have the unintended consequence of many physicians and allied health-care workers deciding to leave their employment due to the high emotional and professional pressure and lack of protection (12).

In summary, all efforts have to be made in order to protect health-care workers from acts of abuse by strictly applying current legislation and assessing the need for new regulations to protect those on front-line operations. Any failure will result in poor patient recovery, family distress, and the loss of valued health-care workers from their professions due to physical and psychological abuse.

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Transition from pandemic to infodemic: an analysis of Turkish-language COVID-19 YouTube videos

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Abstract

Background: YouTube can be a powerful educational tool for the dissemination of health information. However, if uploaded health-related videos are inaccurate, it can mislead, create confusion and generate panic.

Aims: This study aimed to determine the success of the most-watched Turkish-language COVID-19 YouTube videos regarding information and guidance on the disease for the public. The secondary aim of this study was to evaluate the accuracy and quality of such video content.

Methods: The study was conducted during May 2020 and analysed 133 videos. The length of the videos, the number of likes and dislikes, comments and views, how long they have been on YouTube, Medical Information and Content Index (MICI) Score, mDISCERN scores, global quality scores, and the source and target audiences of the videos were all determined.

Results: The average MICI Scores of videos was 2.48±3.74 and the global quality scores was 1.27±0.64. When MICI Scores were compared between video sources, the scores of academic hospitals and government videos were significantly higher. The global quality scores of videos from news agencies and independent users was significantly lower (< 0.001). The mDISCERN score of the videos uploaded by news agencies and categorized as useful was higher than the others (*P* < 0.001). Among the targeted videos, only the global quality scores of the videos made for health-care workers were found to be significantly higher.

Conclusion: Health-care professionals should upload more videos to improve the quality of health-related video content available on YouTube. Accompanied by evidence-based information, the issues of diagnosis, ways of transmission, prevention and treatment of diseases should be emphasized.

Keywords: COVID-19, pandemic, infodemic, YouTube, Turkey

Introduction

Coronavirus Disease 2019 (COVID-19), which was first detected in Wuhan, China, in late December 2019, has become one of the most severe pandemics in history. In Turkey, the first COVID-19 case was diagnosed 11 March, 2020, and by 20 May 2020, there were 152 587 cases and 4222 deaths reported in the country (*1*). Common signs of infection are respiratory symptoms, fever, cough, and dyspnea. In more severe cases, pneumonia, severe acute respiratory infection, kidney failure, and even death may develop (*2*).

COVID-19 related concerns had a rapid impact on the global financial markets and in many industrial sectors with potential long-term consequences (*3*). In the early stages of the pandemic, some news organizations reported a rapid increase in anti-Asian racism (*4-6*). Public fears about COVID-19 also led to the panic purchase of consumables, including personal protective equipment, reducing the availability of supplies for health-care professionals (*7*).

The most effective way to inform the public about COVID-19 is to publish accurate information that is easily accessible and understandable. Google Trends showed a significant increase in interest in COVID-19 since the beginning of February 2020 (*8*), and the World Health Organization (WHO) has described this excessive information about COVID-19 as an 'infodemia' (*9*) – excessive or unfounded information or news causing fear and panic in society and leading to difficulties in the management of the pandemic. To help mitigate this, WHO works with social media organizations to direct users seeking information about COVID-19 to reliable sources (*10*). Despite these efforts, during rapidly developing situations the potential to spread inaccurate information through online platforms is high (*11,12*). YouTube, the second most popular social media platform

and the world's largest media sharing site, has the highest user numbers following Google, with over 2 billion users. The daily watch time of YouTube is 1 billion hours (13,14).

YouTube's influence in education and information dissemination lies in the quality of its audio and visual communication compared to other social media platforms. Although YouTube is a powerful educational tool that can disseminate health-care professionals' knowledge and influence public behaviour, it can be a misleading, panic-generating, and confusing source of information if misused (15). While appropriate YouTube content may benefit government agencies and health-care organizations in relieving public anxiety and implementing the measures to control the spread of the disease, the spread of false information can cause paranoia and accelerate the spread of infection (16). Previous studies have shown that YouTube is both a useful and a misleading source of information during public health crises, including the H1N1, Ebola, and the Zika outbreaks. These studies have shown that approximately 23%–26.3% of YouTube videos are misleading and uploaded by independent users. Accurate, informative and good quality videos do not stand out in these studies (17–19).

Although these studies provide preliminary information on the use of YouTube during public health crises, they have limited adaptability to the COVID-19 outbreak. Current lockdown measures at home have resulted in an excessive increase in YouTube usage. However, there is insufficient evidence in the literature on the quality and accuracy of YouTube content related to the COVID-19 outbreak. Content analysis of social media and online platforms has become an important research topic in recent years. Therefore, the main purpose of this study is to determine the success of the most-watched Turkish COVID-19 YouTube videos regarding information and guidance on the disease for the public. The secondary aim of this study is to evaluate the accuracy and quality of video content.

Methods

The YouTube social media platform was searched on 20 May 2020 with the Turkish words 'koronavirüs' (coronavirus), 'koronavirus salgını' (coronavirus outbreak), and 'COVID-19 salgını' (COVID-19 outbreak). The first 400 videos found in the search were saved to a playlist in a newly opened YouTube account. Videos with less than 1000 views, videos not in the Turkish language, videos less than 2 minutes or longer than 20 minutes were excluded from the study. Studies show that the length of a quality YouTube video is 10–16 minutes on average, and the average time spent on YouTube is 40 minutes (14). Hence, why video times were limited to 20 minutes in this study. In total, 133 videos meeting the criteria were included. Kappa statistics were used to determine reliability among raters.

The length of the videos, the likes and dislikes they received, the number of comments, the number of views, how long they have been on YouTube, Medical

Information and Content Index (MICI) score, mDISCERN scores, global quality scores (GQS), and the source and target audiences of the videos were determined. Since the duration of the videos available on YouTube affects the number of likes, dislikes, comments and views, video popularity was determined using view ratio, like ratio, and video power index (VPI) parameters. The ratios and indexes were calculated using the following formulas: view ratio: (number of views/number of days since upload); like ratio: (number of like × 100 / [number of like + number of dislikes]); VPI: [like ratio × view ratio / 100] (20).

The source of the videos was news agencies, academic hospitals, government, doctors, and independent users. Health-care professionals and patients/non-health care professionals were accepted as the target audience. The videos were categorized as useful, personal experience, news updates, and misleading. Videos with scientifically correct information about epidemiology, pathogenesis, symptoms, complications, disease prevention, lifestyle changes, and pharmacological treatment were placed in the useful category. Videos that have not been scientifically proven or supported by current guidelines and contain personal propaganda were classified as misleading. Since the diagnosis of coronavirus, videos providing patients' own recollections were grouped in personal experiences. Videos that contain information about the current state of the disease in terms of death and positive cases, and that do not contain information about prevention, treatment or disease prevention measures, were classified as news updates.

The mDISCERN score is a five-question scale adapted from a 16-question DISCERN vehicle developed by Singh (21) and by Charnock, et al (22). Each criterion is rated as 1–0 (yes/no) and scored between 0 and 5. Global quality score is a five-point scale based on the quality of information, the flow of the information supplied online, and ease of use (Table 1). MICI Score examines the video by the subtitles of prevalence, transmission, signs and symptoms, screening tests, and treatment/outcome. Each main category contains five different criteria, resulting in 25 different criteria in MICI. Each criterion is rated as 1–0 and scored between 0 and 25 (Table 1).

The DISCERN questionnaire is a valid and reliable tool for analysing written consumer health information. It is the first standardized quality index of consumer health information that can be used not only by health-care professionals but also by patients and the general population as a critical assessment tool to assess health information. Global quality score is a tool for evaluating the overall quality of the site, including information flow, ease of use, and usefulness to patients. The MICI score was developed to evaluate the content quality of videos containing medical information during the Ebola epidemic and was used in studies on COVID-19.

Statistical analysis

Data statistics were calculated using SPSS 21.0 for Windows (IBM). The suitability of the data to the normal dis-

Table 1 Global Quality Score, mDISCERN, Medical Information and Content Index (MICI) Score parameters

Global Quality Score
1. Low quality, video information flow weak, most information missing, not beneficial for patients
2. Usually, low quality and low flow of information, some listed information and many important issues are missing, very limited use for patients
3. Moderate quality, the insufficient flow of information, and some important information is sufficiently discussed, but some are poorly discussed and somewhat useful for patients
4. Good quality and generally good information flow. Most of the relevant information is listed, but some topics are not covered, useful for patients
5. Excellent quality and information flow, very useful for patients
mDISCERN score
1. Are the aims clear and achieved?
2. Are reliable sources of information used?
3. Is the information presented balanced and unbiased?
4. Are additional sources of information listed for patient reference?
5. Are areas of uncertainty mentioned?
Medical Information and Content Index (MICI) Score
Prevalence: If mentioned in the video, each item is given 1 point. Maximum score 5
1. Number of confirmed cases reported
2. Number of suspected cases reported
3. Number of reported deaths
4. Number of relevant countries
5. Number / rate of severely ill patients
Transmission: If mentioned in the video, each item is given 1 point. Maximum score 5
1. The place of origin of the virüs
2. Zoonotic transmission (i.e. contact with animals)
3. Transition from person to person
4. Incubation period
5. Droplet delivery path (includes: mask wearing, hand washing measures)
Signs and Symptoms: If mentioned in the video, each item is given 1 point. Maximum score 5
1. Fever
2. Upper respiratory symptoms (cough, sore throat, runny nose)
3. Lower respiratory symptoms (pneumonia) / shortness of breath)
4. Myalgia, arthralgia, drowsiness
5. Diarrhea
Screening Test: If mentioned in the video, each item is given 1 point. Maximum score 5
1. A testing entity is mentioned
2. Talks about the use of respiratory secretions for testing purposes
3. Mentions that PCR can be used for identification
4. Shows how this test is done
5. Speaks about the criteria for testing/screening
Treatment / Result: If mentioned in the video, each item is given 1 point. Maximum score 5
1. Some patients survive the disease with mild symptoms
2. Some patients become more seriously ill (talk about hospitalization, intensive care)
3. Can be dangerous or cause death
4. Treatment is supportive, but in some cases, HIV drugs are used
5. Vaccine not currently available

tribution was evaluated using the Kolmogorov-Smirnov test. Parametric tests were used since the data were distributed normally. Independent Samples *t*-test was used to compare two groups, and One-Way ANOVA was used for more than two groups. Post-hoc analysis was performed using the Tukey test. Chi-Square tests were used to compare categorical variables. Fisher's Exact test was used if the expected count of cells were less than 5 or the percentage of cells was >20%. Pearson correlation analysis was used to analyze the correlation between groups.

Table 2 Comparison of video categories with popularity indexes and scores

Characteristics	Useful	Personal experience	News update	Misleading	Total	P X²
Number of videos	35 (26.31%)	30 (22.55%)	37 (27.81%)	31 (23.33%)	133	
Video length (min)	8.69±5.15	9.73±4.95	7.01±4.06	8.44±5.36	8.21±4.93	0.160
View ratio	4746.88±14442.69	7196.57±14899.89	5737.73±10929.39	5337.06±6495.97	5747.33±10846.04	0.876
Like ratio	93.12±6.30	95.15±2.64	88.24±21.86	93.62±3.35	92.04±13.30	0.109
Video power index	4515.18±14121.17	6856.25±14139.68	5072.22±10393.57	4930.12±5976.91	5284.11±10320.42	0.866
MICI Score	6.77±6.51	2.43±2.95	1.83±2.49	1.87±3.17	2.48±3.74	<0.001[a]
Prevalence	8 (6.3%)	3 (2.3%)	3 (2.3%)	3 (2.3%)	17 (12.8%)	0.519 14.084
Transmission	26 (19.6%)	14 (10.5%)	15 (11.3%)	14 (10.5%)	69 (51.9%)	<0.001[a] 41.751
Clinical symptoms	14 (10.6%)	8 (6.1%)	7 (5.4%)	4 (3.2%)	33 (%24.8%)	0.001[a] 37.643
Screening/tests	8 (6.3%)	4 (3.1%)	2 (1.6%)	3 (2.4%)	17 (12.8%)	0.259 18.067
Treatment/outcomes	15 (11.3%)	6 (4.6%)	8 (6.0%)	5 (3.8%)	34 (25.6%)	0.006 32.026
GQS	2.45±1.01	1.23±0.42	1.08±0.36	1.12±0.42	1.27±0.64	<0.001a
mDISCERN score	2.57±1.59	1.46±1.59	2.08±1.78	1.22±1.26	1.70±1.61	0.003b
Source of upload						
News agencies	10	11	32	9	62 (46.6%)	
Academic hospitals	5	0	1	0	6 (4.5%)	
Government	3	0	0	0	3 (2.3%)	<0.001[c] 76.369
Physicians	12	2	0	3	17 (12.8%)	
Independent users	5	17	4	19	45 (33.8%)	
Target audience						
For healthcare providers	9	1	0	1	11 (8.3%)	<0.001** 19.378
For patients and non-healthcare workers	26	29	37	20	122 (91.7%)	

[a]Significant difference between useful video category and other groups
[b]Significant difference between useful video category and personal experience and misleading groups
[c]News agencies and independent users are significantly higher than others

Ethical approval

Since the source of the data is public, institution review board approval was not required.

Results

The average duration of 133 videos that met the inclusion criteria was 8.4 ± 4.95 minutes (min: 2.03, max: 19.75). The number of likes of the videos was 548 281, and the video with the most likes received 68 000. The average number of likes was 4122.41 ± 9557. The total number of dislikes of the videos was 28 540, and the video with the most dislikes received 3600. The average number of dislikes was 214.59 ± 442.4. The total number of comments was 78 961, and the video with the most comments received 5218. The average number of comments was 593.69 ± 931.64. The total number of views was 40 628 198, and the most watched video was viewed 4 922 386 times. The average number of views was 305 475.17 ± 611 151.4. The videos' availability on YouTube ranged from 4 days to 122 days, with a duration of 7606 days in total and an average duration of 57.19 ± 26.47 days.

The level of agreement between researchers was significantly high for both scores (Cohen's kappa: 0.82 for MICI, 0.87 for mDISCERN, and 0.75 for GQS, $P < 0.001$). Useful videos' MICI and GQS scores were significantly higher than other categories ($P < 0.001$). The mDISCERN score of the videos uploaded by news agencies and categorized as useful was higher than the others ($P < 0.001$). Also, the number of information about transmission ($P < 0.001$) and symptoms ($P = 0.01$) in useful videos was higher than other video sources. News agencies and independent users uploaded most of the videos. In addition, the majority of the target audience were patients and non-health care professionals (Table 2).

When MICI scores were compared between video sources, the scores of academic hospitals and government were significantly higher. The GQS of videos from news agencies and independent users was significantly lower ($P < 0.001$). There was no significant difference between the other parameters (Table 3).

Table 3 Comparison of video sources with findings and scores

Characteristics	News agencies	Academic hospitals	Government	Physicians	Independent users	P
Number of videos	62 (46.61%)	6 (4.51%)	3 (2.25%)	17 (12.78%)	45 (33.83%)	
Video length (min)	6.98±4.46	8.63±6.07	11.34±6.98	10.09±4.50	9.46±5.17	0.077
View ratio	5972.57±9715.17	13577.36±32987.72	116.28±100.07	2991.47±4154.48	5707.01±12926.48	0.404
Like ratio	90.40±17.4	97.29±2.47	93.77±7.31	92.97±6.29	94.01±3.57	0.503
Video power index	5425.16±9214.55	13386.48±32527.14	110.4±96.70	2745.45±3710.71	5345.37±12212.80	0.367
MICI Score	2.75±3.62	9.50±8,01	11.66±8.38	3.76±4.89	2.42±3.93	<0.001*
GQS	1.27±0.60	2.50±1.37	3.00±1.00	2.11±1.05	1.31±0.66	<0.001**
mDISCERN Score	1.64±1.65	3.33±1.86	3.66±0.57	2.17±1.62	1.75±1.58	0.113

*MICI scores of academic hospitals and government videos are significantly higher than others
**GQS score of videos from News agencies and independent users was significantly lower than others

Among the targeted videos, only the GQS of the videos made for health care workers was found to be significantly higher (*P* = 0.014) (Table 4). A positive correlation was found between MICI score, view ratio and VPI, and a negative correlation was observed between like ratio and MICI score. However, these correlations were not statistically significant. A strong positive relationship was detected between mDISCERN and view ratio and VPI, and a negative relationship between like ratio and mDISCERN score. While there was a significant weak negative relationship between GQS and view ratio, a non-significant positive relationship with like ratio and a negative relationship with VPI were detected (Figure 1).

Discussion

The study results revealed that only 26.31% of the videos had useful content. Compared to other YouTube content studies, useful video content was found at 61.3% in a study during the H1N1 outbreak, and 58.6% in a study conducted in the first months of the COVID-19 outbreak (17,23). The reason for this difference in the useful video content may be that our study included only videos in the Turkish language. In addition, infodemia has grown as people stayed at home for longer periods and shared videos for financial or entertainment purposes without any research aims.

The characteristics of the videos that many people have posted as YouTube content have changed, and many YouTube channels have started to publish videos about the COVID-19 outbreak even though they have no previous knowledge or experience. Accordingly, our study's personal experience video rate was 22.55%, and the misleading video rate was 23.33%. Useful videos' view ratio and VPI were lower than other groups. The reason for this is possibly a lack of popularity of those who want to inform the public by trying to provide accurate information and prevent the spread of the disease. In a YouTube study conducted by Atci et al., the rate of viewing videos and VPIs of misleading categories were found higher than useful content (24). Similarly, a study by Li HO-Y et al. indicated that more than 25% of YouTube's most viewed English language videos contain misleading information, reaching over 62 million views and about 25% of total views (25).

Useful videos have significantly higher MICI, mDISCERN, and GQS scores than other groups because these are mostly shared by doctors either directly or via news channels. The reason for the useful video surplus from news channels is that the interviews with doctors are frequently published on YouTube. When we compared the MICI score sub-parameters with other video groups, it could be seen that the clinical symptoms and related transmission scores were significantly higher in the useful video group. These data are similar to the study

Table 4 Comparison of video target audiences with scoring and popularity indexes

	Health-care providers	Patients/non-health care workers	P
Total MICI Score	3.63±5.35	3.24±4.58	0.790
mDISCERN Score	2.45±1.86	1.81±1.64	0.226
GQS	2.09±0.94	1.43±0.82	0.014*
Video length (min)	7.55±2.61	8.46±5.11	0.330
View ratio	2273.37±3097.98	6022.75±12591.50	0.328
Like ratio	94.72±3.64	92.12±12.90	0.508
Video power index	2107.95±2834.26	5582.27±12072.61	0.344

*GQS of healthcare providers targeted videos have higher value

Figure 1 Correlation analysis between video popularity indexes and scores
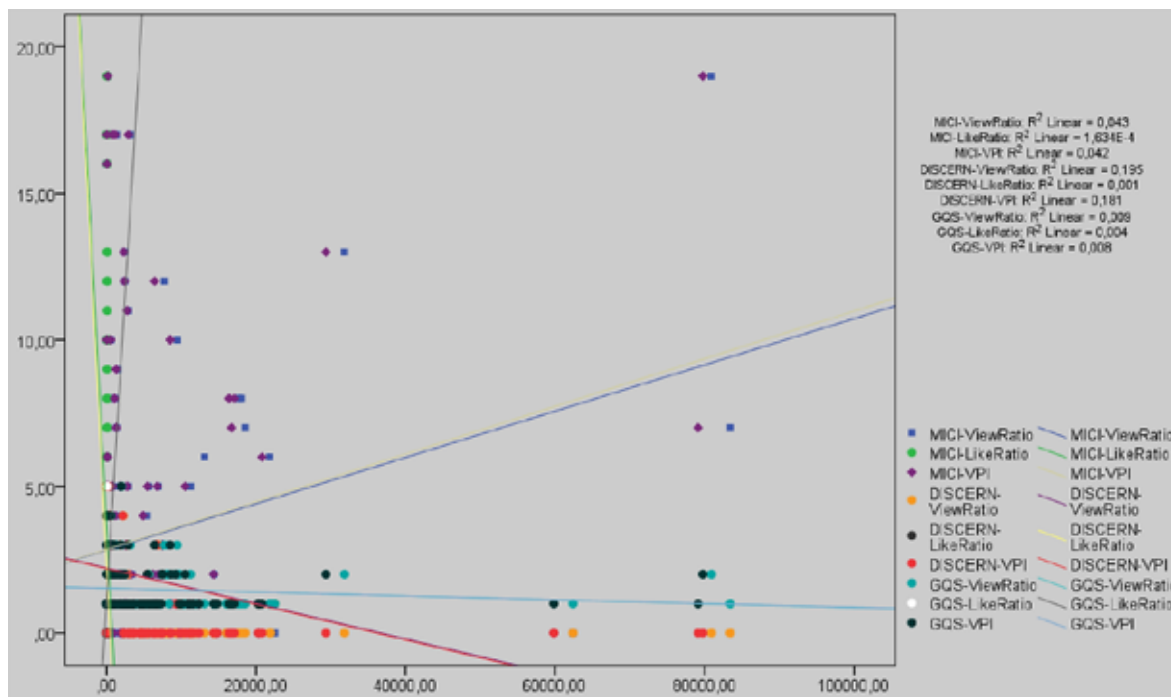
	ViewRatio	LikeRatio	VPI
MICI	0.207*, *P*=0.017	0.13, *P*=0.883	0.204*, *P*=0.018
mDISCERN	-0.441**, *P*<0.001	-0.037, *P*=0.688	-0.425**, *P*<0.001
GQS	-0.095, *P*=0.278	0.062, *P*=0.481	-0.089, *P*=0.310

*Significant correlation at the level of 0.05 level.
**Significant correlation at the level of 0.01 level.

of P. Khatri et al. on COVID-19 and YouTube (*23*). The information, which is shared about clinical symptoms and the spread of the disease, requires a medical framework, scientific research, and patient examination. Therefore, it is normal for this type of information to be in the useful video group that is more commonly shared by doctors.

Misleading and personal experience videos are mostly composed of inappropriate content without a scientific basis, so it is quite challenging to access any accurate or reliable information by watching this group of videos. The mDISCERN scores of the videos in the useful and news update groups were significantly higher. The DISCERN score was created to obtain high-quality, evidence-based patient information and to assess the quality of written and visual knowledge about the treatment options of patients and information providers (*22*).

We saw that only 8.7% of the videos targeted health-care professionals when we looked at the videos according to their target groups. Health-care professionals generally refer to evidence-based scientific articles instead of YouTube videos in order to access accurate and quality medical information. However, as a commercial social media platform, YouTube consists of videos that do not have a control mechanism for the accuracy of the content. Thus, a low target rate for health-care professionals would be expected. For this reason, informative videos for health-care professionals cannot find a large audience

on YouTube compared to other platforms. Informative videos often do not appear higher on the YouTube drop-down menus or in the foreground, because they do not have enough likes or views.

The number of videos targeting health-care workers was quite low because we included over 1000 viewed videos in the study and most videos targeting health-care workers were viewed less than 1000. The misleading and personal experience group videos had significantly lower mDISCERN scores. The videos in the personal experience and misleading group consisted mainly of videos disseminating conspiracy theories. Few videos reflected the experiences of people who actually suffered from the disease.

The MICI and mDISCERN scores of the uploaded videos by academic hospitals and government are significantly higher than the other group videos. Because the Ministry of Health, medical faculties and research hospitals have broadcast many informative videos about the treatment protocols, prevention methods, test and confirmed numbers since the first case was detected in Turkey. Accordingly, our findings are similar to the results of the Li Ho-Y et al. study on COVID-19 and YouTube videos (*25*). On the other hand, some well-known physicians underestimated the clinical severity of the COVID-19 disease and shared their non-scientific and optimistic predictions at the beginning of the outbreak.

These physicians lost their credibility in the community after the increase in confirmed cases and death rates, so these uploaded videos are possibly associated with the low MICI and mDISCERN scores.

The videos shared by news agencies and independent users had lower GQS than other videos. GQS is a scale, which tests how much the audiences benefit from the videos and posts shared by unqualified people, which are therefore insufficient in quality. Our results were similar to the findings in the study on YouTube videos about psoriasis misinformation by Qi, J et al (26). Although the videos shared by news agencies and independent users had low GQS, the view ratio and VPI scores were higher than the government and physicians' group. This might be because the videos shared on YouTube channels, which had many followers before the epidemic, reached more people and were watched regardless of their content. Even if the most accurate information is conveyed with the best quality video, it does not reach enough people if there are not enough followers on social media.

As a part of the sociocultural background in Turkey, conspiracy theories prevail. The effects of this can be seen in the view rates of COVID-19 related videos and their contents. This also explains the reason why videos uploaded by freelance users and news agencies have higher view rates regardless of their low content qualities. A substantial part of the Turkish population was found to believe in conspiracy theories rather than evidence-based facts. Therefore, a population with such tendencies watches videos with content that they would prefer to believe in or that interests them rather than contents conveying commonly accepted facts. The lack

of ethical boundaries in social media and its desire to get people's attention by creating a sense of panic has been exploited during this pandemic. Although social media sometimes exposes well-hidden secrets, it is also the case that fictional events are presented as facts. The focus on drawing attention and becoming a trending topic of media organizations can lead them to convey the news in a way which causes population-wide panic. In addition to television and newspapers, social media is a news platform relatively trusted by the greater population. However, the importance attributed to view rates and recognition by this platform leads to the sharing of videos with nonfactual or inaccurate content (27,28).

Conclusion

Health-care professionals should upload more videos to improve the quality of YouTube's health-related video content. Accompanied by evidence-based information, the issues of diagnosis, means of transmission, prevention, and treatment of diseases should be emphasized. Individual channels about health should be encouraged and the awareness of their existence increased. Adding a YouTube academic tab, where videos are reviewed and criticized by editor control, as in Google Academic, will both increase the use of YouTube by health-care workers and make it easier for the public to access more accurate information. The videos could indeed be evaluated by volunteer health professional referees.

De la pandémie à l'infodémie : analyse de vidéos YouTube turques sur la COVID-19

Résumé

Contexte : YouTube peut être un puissant outil pédagogique pour la diffusion de l'information sanitaire. Cependant, si les vidéos liées à la santé postées présentent des informations inexactes, elles peuvent induire en erreur, créer de la confusion et générer la panique.

Objectifs : La présente étude visait à déterminer la pertinence des vidéos YouTube sur la COVID-19 en langue turque les plus visionnées eu égard à l'information et l'orientation du public sur la maladie. L'objectif secondaire de cette étude était d'évaluer l'exactitude et la qualité de ces contenus vidéo.

Méthodes : L'étude a été menée en mai 2020 et a analysé 133 vidéos. La longueur des vidéos, le nombre de « j'aime ce contenu » et de « je n'aime pas ce contenu », de commentaires et de vues, la durée de leur présence sur YouTube, le score MICI (Medical Information And Content Index), les scores DISCERN moyens, les scores de qualité globale, ainsi que la source et les publics cibles des vidéos ont tous été déterminés.

Résultats : Les scores MICI moyens des vidéos étaient de 2,48 (±3,74) et les scores de qualité globale étaient de 1,27 (±0,64). Lorsque les scores MICI ont été comparés entre les sources des vidéos, les scores des hôpitaux universitaires et des vidéos gouvernementales étaient nettement plus élevés. Les scores de qualité globale des vidéos des agences de presse et des utilisateurs indépendants étaient significativement plus faibles (*p* < 0,001). Le score DISCERN moyen des vidéos postées par les agences de presse et classées comme utiles était plus élevé que les autres (*p* < 0,001). Parmi les vidéos ciblées, seuls les scores de qualité globale des vidéos réalisées pour les professionnels de santé se sont avérés significativement plus élevés.

Conclusion : Les professionnels de santé devraient mettre en ligne davantage de vidéos pour améliorer la qualité du contenu sur la santé disponible sur YouTube. Les questions du diagnostic, des modes de transmission, de la prévention et du traitement des maladies devraient être mises en exergue tout en apportant des informations fondées sur des données probantes.

التحوُّل من الجائحة المرضية إلى جائحة المعلومات: تحليل لفيديوهات يوتيوب باللغة التركية حول كوفيد-19

فاتح كاكماك، سيدا أوزكان، أفسين إييكتشي، ألتوج كانباكان، توركر ديمرتاكان، سراب بيبيروجلو، كوبرا كاكماك، نورا سيلكوكي، تركان إيكيزيللي

الخلاصة

الخلفية: يمِكن أن يكون موقع يوتيوب أداةً تعليميةً قويةً لنشر المعلومات الصحية، لكن إذا نُشِرت مقاطع فيديو صحية غير دقيقة، فقد تؤدي إلى التضليل وتُحدِث الارتباك وتثير الذعر.

الأهداف: هدفت هذه الدراسة إلى تحديد نجاح الفيديوهات الأكثر مشاهدةً للجمهور على موقع يوتيوب والخاصة بكوفيد-19 باللغة التركية، فيما يتعلق بالمعلومات والإرشادات الخاصة بالمرض. وتمثَّل الهدف الثانوي من الدراسة في تقييم دقة محتوى هذه الفيديوهات وجودتها.

طرق البحث: أجريت هذه الدراسة خلال شهر مايو/ أيار 2020 وحُلل 133 فيديو. وحُدِّد طول مقاطع الفيديوهات، وعدد مرات الإعجاب وعدم الإعجاب بها، والتعليقات، وجهات النظر، والمدة المستغرقة على موقع يوتيوب، ودرجات مؤشر المعلومات والمحتوى الطبي (MICI)، ودرجات الاستبيان المُعدَّل للإدراك (mDISCERN)، ودرجات الجودة العالمية، ومصدر مقاطع الفيديو وجمهورها المستهدف.

النتائج: بلغ متوسط درجات مؤشر المعلومات والمحتوى الطبي MICI لمقاطع الفيديو 3.74±2.48، وبلغت درجات الجودة العالمية 1.27±0.64. وعندما قورنت درجات مؤشر المعلومات والمحتوى الطبي بين مصادر الفيديو، كانت درجات المستشفيات الأكاديمية ومقاطع الفيديو الحكومية أعلى كثيرًا. وكانت درجات الجودة العالمية لمقاطع الفيديو من وكالات الأنباء والمستخدمين المستقلين أقل كثيرًا (الدلالة الإحصائيــــة $P > 0.001$). ومن بين مقاطع الفيديو المستهدفة، تبيَّن أن درجات الجودة العالمية لمقاطع الفيديو المقدمة للعاملين في الرعاية الصحية هي وحدها الأعلى بفارق كبير.

الاستنتاجات: ينبغي للعاملين في الرعاية الصحية تحميل المزيد من مقاطع الفيديو المتاحة على موقع يوتيوب، لتحسين جودة محتوى الفيديو المتعلق بالصحة، وينبغي التأكيد على مسائل التشخيص، وطرق انتقال الأمراض، والوقاية منها وعلاجها، بحيث تصاحبها معلومات مسندة بالبراهين.

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Comparative study of salt, total fat and sugar contents of mayonnaise and salad dressings from the Iranian market

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Abstract

Background: Dietary intake of fat, salt and sugar is important for prevention of noncommunicable diseases; therefore, evaluation of these constituents in industrial packaged foods is necessary.

Aims: To compare the levels of fat, salt and sugar in mayonnaise and salad dressings commercialized in the Islamic Republic of Iran in 2017 and 2019, and to monitor compliance with standard limits.

Methods: The levels of fat, salt and sugar in 12 mayonnaise and 47 salad dressing samples collected from an Iranian market were evaluated according to the Iranian Institute of Standards and Industrial Research of Iran (ISIRI) and compared between 2017 and 2019.

Results: We determined compliance with ISIRI limits and other standard targets. The salt content of mayonnaise samples significantly decreased from 2.03 (standard deviation; 0.3) g/100 g in 2017 to 1.61 (0.12) g/100 g in 2019 ($P = 0.031$). Total sugar level of mayonnaise samples significantly decreased from 5.97 (1.14) g/100 g in 2017 to 3.63 (0.53) g/100 g in 2019 ($P = 0.005$). The total sugar level of salad dressings significantly decreased from 8.97 (2.34) g/100 g in 2017 to 1.58 (2.65) g/100 g in 2019 ($P = 0.039$). Compliance of mayonnaise and salad dressing fat contents with ISIRI limits increased from 42.9% and 84.6% in 2017 to 100% and 90.5% in 2019, respectively. None of the mayonnaise samples met the British Food Standards Agency salt target (maximum 1.25 g/100 g) in 2017 and 2019.

Conclusions: Reformulation of these products for reduction of salt and sugar content is necessary.

Keywords: mayonnaise; salad dressing; fat; salt; sugar

Introduction

Noncommunicable diseases (NCDs) such as cardiovascular diseases and diabetes are major concerns in industrialized countries (1) and were responsible for 82% of deaths in the Islamic Republic of Iran in 2016 (2). There is a link between dietary intake of fat, salt and sugar and NCDs (3–6). Trans and saturated fatty acids are a major cause of coronary heart disease (7). Excessive salt intake is related to risk of high blood pressure and cardiovascular diseases (5), which are responsible for 43% of mortality in the Islamic Republic of Iran (2).The World Health Organization (WHO) recommends a maximum daily intake of salt of 5 g for adults (8); however, the average intake in the Islamic Republic of Iran was 10 g/day in 2016 (2). The highest daily intake of sodium for women (3.9 g/day) in the Eastern Mediterranean Region was reported in the Islamic Republic of Iran (9). Consumption of foods containing high amounts of sugar increase the risk of dental caries (10). There is also a direct relationship between sugar intake in sweet drinks and diabetes (3,4).

Nutritional status is one of the important causes of NCDs. Therefore, WHO implemented a global action plan for prevention of NCDs in 2004 and reduction of salt, sugar and saturated fatty acid levels, and elimination of trans fatty acids in commercial food products are emphasized. The global aims of 30% reduction in salt intake by 2025 and halting the increase in diabetes and obesity were set by WHO (11). Eighty-three countries have salt-reduction strategies and 59 have aimed to reduce salt in commercial foods by establishing voluntary and mandatory targets, industry meetings, and reformulation. The Islamic Republic of Iran is one of the countries that is aiming to reduce salt intake by working with the food industry for reformulation of foods (12).

Mayonnaise, an oil-in-water emulsified semisolid food product, is prepared from vegetable oil, acidifying agent, egg yolk and optional components such as mustard and spices (13). Salt can contribute to product flavour and promote emulsion stability (14). It also helps to disperse the granules of egg yolk, which can improve surface

active material. By neutralization of charges on proteins, salt allows them to adsorb to the existing layer on oil droplets. Too much salt can aggregate egg yolk proteins in aqueous phase by dehydrating them. Sugar can limit gelation of egg yolk, as well as being a flavouring agent (*15*). Compared to mayonnaise, which contains 60–80% oil, salad dressing has < 65% oil (*16*). Most previous studies have been done on the basis of the data collected from labelling of packaged mayonnaise and salad dressings (*17–23*) and few have evaluated salt content (*24,25*) total fat and sugar levels (*25*) and fatty acid composition (*26*). Based on a national programme, and in order to lower the incidence of NCDs, the Institute of Standards and Industrial Research of Iran (ISIRI) has revised the limits for sugar, fat and salt content.

The objectives of this study were to compare total fat, salt and sugar levels of commercial mayonnaise and salad dressing in the Islamic Republic of Iran in 2017 and 2019, and to monitor compliance with ISIRI standards.

Methods

Study design

This was a cross-sectional study and part of a national programme on monitoring the salt, fat, sugar, and saturated and trans fatty acid content in commercial and traditional food products in the Islamic Republic of Iran.

Sample collection

A total of 12 mayonnaises and reduced-fat mayonnaises and 47 salad dressing samples from 11 brands were collected from supermarkets in Tehran Province in 2017 and 2019. Salad dressing samples include French, thousand island, sandwich and other salad dressings (yoghurt, cheese and garlic, lemon and mild mustard dressings). The purchased samples were kept in the refrigerator and tested before the expiration date. All chemicals and solvents were of analytical grade and used without further purification. The salt, total fat and sugar levels of the samples were determined in triplicate according to the ISIRI methods (*13,27*).

Determination of salt

For determination of salt content, 25 ml 0.1 N $AgNO_3$ and 2 ml concentrated nitric acid were added to 3 g of sample. The solution was made up to 100 ml with distilled water and filtered. After addition of 2 ml $FeNH_4(SO_4)_2$ 12 H_2O to 50 ml filtrate, titration by NH_4SCN was conducted until the first appearance of a red–brown colour. Percentage of salt was calculated on the basis of the volume of NH_4SCN used and the volume of $AgNO_3$ (*27*).

Determination of fat

Total fat levels of the samples were determined by the Gerber method using butyrometer according to the Iranian national standards (*13,28*).

Determination of sugar

For determination of total sugar, about 1 g active carbon was added to 26 g homogenized sample and the volume was made up to 100 ml and filtered. Twenty-five millilitres of filtrate was transferred to a 100-ml round-bottom flask and 10 ml concentrated hydrochloric acid and 10 ml distilled water were added to the filtrate. For the hydrolysis step, the flask was rotated for 3 minutes and static for 7 minutes in a 60–70°C water bath. The flask was cooled in a beaker containing cold water; a few drops of phenolphthalein were added and the filtrate was neutralized by NaOH. After recooling, the flask was made up to 100 ml and neutralized filtrate was refiltered. While heating, the refiltrate was titrated using 5 ml Fehling's A and 5 ml Fehling's B solutions and 1–2 ml methylene blue with a few pearls and distilled water (*27*).

The measured fat content was compared with the maximum fat content limits set by ISIRI for mayonnaise (65 g/100 g), reduced-fat mayonnaise (40–50 g/100 g) and salad dressings (36–56 g/100 g) (*13*). No standard limits were determined by ISIRI for salt and total sugar. Therefore, the measured salt contents were compared with the maximum salt targets for 2017 of the United Kingdom of Great Britain and Northern Ireland (UK) Food Standards Agency (FSA) for mayonnaise (1.25/100 g), reduced-fat mayonnaise (1.7 g/100 g) and salad dressings (1.5 g/100 g) (*29*) and the maximum sodium targets of the Federal Commission for Protection against Health Risks (COFEPRIS) for mayonnaise (750 mg/100 g) (*21*). After changing the units of the sodium target from mg/100 g to g/100 g, they were converted to salt by multiplying by 2.54 in order to become comparable with the measured salt content of our study.

Statistical analysis

The data are shown as the mean (standard deviation) of triplicate determinations and analysed by independent sample *t* test, one-way analysis of variance and one sample *t* test using SPSS version 21 (SPSS Inc./IBM Corp., Chicago, IL, USA). *P* ≤ 0.05 was considered significant.

Results

In the present study total fat, salt and sugar levels of 59 mayonnaise and salad dressing samples were evaluated in 2017 and 2019. In 2017, the samples included 7 mayonnaises and reduced-fat mayonnaises and 26 salad dressings. In 2019, 5 mayonnaises and reduced-fat mayonnaises and 21 salad dressings were tested.

Mayonnaise

The mean levels of total fat did not differ significantly between 2017 and 2019 in any of the mayonnaise samples (Table 1). The salt content of mayonnaise samples was significantly reduced from 2.03 (0.3) g/100 g in 2017 to 1.61 (0.12) g/100 g in 2019 (*P* = 0.031) (Table 2). As shown in Table 3, total sugar level of mayonnaise samples was significantly reduced from 5.97 (1.14) g/100 g in 2017 to 3.63 (0.53)g/100 g in 2019 (*P* = 0.005) (Table 3).

Table 1 Total fat levels (g/100 g) in mayonnaise and salad dressing samples collected from Iranian markets in 2017 and 2019

Types	Period 1 (2017)			Period 2 (2019)			P
	No.	Mean (SD)	Range	No.	Mean (SD)	Range	
Mayonnaise	6	51.0 (13.59)	30–66	4	58.36 (14.12)	41.44–70	0.432
Reduced-fat mayonnaise	1	55	—	1	40.24	—	—
All salad dressings	26	40.38 (8.84)	21–53	21	38.93 (9.86)	21–54	0.596
Sandwich	2	47 (8.49)	41–53	2	47.5 (9.19)	41–54	0.960
Thousand island	8	36.76 (9.36)	24–51	5	34.25 (6.24)	26–41	0.912
French	8	44 (8.43	29–53	8	43.86 (7.93)	32–54	0.515
Other salad dressings	8	38.75 (8.00	21–46	6	40.33 (9.90)	21–50	0.587

Replicates = 3 (for all samples). SD = standard deviation.

Salad dressings

The total fat levels did not differ significantly between 2017 and 2019 in any of the salad dressing samples (Table 1). The salt content of salad dressings in 2019 [1.86 (0.39) g/100 g] did not differ significantly from that in 2017 [2.07 (0.37) g/100 g] (Table 2). Total sugar level of salad dressings was significantly reduced from 8.97 (2.34) g/100 g in 2017 to 7.58 (2.05) g/100 g in 2019 (P = 0.039) (Table 3). A similar significant reduction was observed for total sugar level of other salad dressings between 2017 and 2019 (P = 0.038).

Compliance with standard limits

Compliance of mayonnaise and salad dressing samples with ISIRI limits was 42.9% and 84.6% in 2017, respectively, which increased to 100% and 90.5% in 2019 (Table 4).

As there is no ISIRI limit for the salt and total sugar contents of mayonnaise and salad dressing, we compared the salt content of our samples with the targets established by the UK FSA and COFEPRIS. Although none of the salt contents of the mayonnaise samples was compatible with the UK FSA targets (maximum 1.25 g/100 g), 33.3% and 100% of the mayonnaise samples were compatible with COFEPRIS in 2017 and 2019, respectively (Table 5). For salad dressings, 11.5% and 23.8% of samples were in accordance with UK FSA salt targets (maximum 1.5 g/100 g) in 2017 and 2019, respectively.

Total fat levels of mayonnaise samples in 2019 [58.36 (14.12) g/100 g] and 2017 [51.0 (13.59) g/100 g] were not in accordance with the ISIRI limit (≥ 65 g/100 g). However, the difference between mean total fat and standard limits was not significant in 2017 (P = 0.053) and 2019 (P = 0.416). The salt content of mayonnaise samples in 2017 [2.03 (0.3) g/100 g] (P = 0.001) and 2019 [1.61 (0.12) g/100 g] (P = 0.010) significantly exceeded the UK FSA target (maximum 1.25 g/100 g). Although mean salt content in 2017 was higher than the COFEPRIS target (1.91 g/100 g), the difference was not significant (P = 0.382). The mean salt content in 2019 was significantly below the COFEPRIS target (P = 0.017).

Total mean fat levels of salad dressing samples were in accordance with the ISIRI limit (36–56 g/100 g) in 2017 [40.38 (8.84) g/100 g] [95% confidence interval (CI): 36.81–43.95%] and 2019 [38.93 (9.86) g/100 g] (95% CI: 34.44–43.42%). The mean salt content of salad dressing samples in 2017 [2.07 (0.37) g/100 g] and 2019 [1.86 (0.39) g/100 g] significantly exceeded the UK FSA target for 2017 (maximum 1.5 g/100 g) (P < 0.001).

Discussion

In the current study, total fat levels of mayonnaise samples in 2017 and 2019 were approximately twice those of mayonnaise samples (30.76 g/100 g) in a study of 6 brands in Malaysia (25). In the current study, the salt content of

Table 2 Salt Levels (g/100g) for the studied mayonnaise and salad dressing samples collected from Iranian markets in 2017 and 2019

Type	Period 1 (2017)			Period 2 (2019)			P
	No.	Mean (SD)	Range	No.	Mean (SD)	Range	
Mayonnaise	6	2.03 (0.30)	1.67–2.46	4	1.61 (0.12)	1.47–1.72	0.031*
Reduced Fat Mayonnaise	1	2	—	1	1.58	—	—
All Salad dressings	26	2.07 (0.36)	1.34–2.47	21	1.86 (0.39)	1.32–2.73	0.069
Sandwich	2	2.13 (0.49)	1.78–2.47	2	1.58 (0.01)	1.57–1.58	0.252
Thousand Island	8	2.19 (0.21)	1.87–2.46	5	1.95 (0.35)	1.51–2.35	0.102
French	8	2.32 (0.29)	1.78–2.69	8	2.05 (0.52)	1.48–2.73	0.191
Other salad dressings	8	1.69 (0.23)	1.34–1.98	6	1.65 (0.13)	1.32–1.95	0.819

Significant difference (P < 0.05). Replicates = 3 (for all samples). SD = standard deviation.

Table 3 Total sugar levels (g/100 g) for mayonnaise and salad dressing samples collected from Iranian markets in 2017 and 2019

Type	Period 1 (2017)			Period 2 (2019)			P
	No.	Mean (SD)	Range	No.	Mean (SD)	Range	
Mayonnaise	6	5.97 (1.14)	4.38–7.80	4	3.63 (0.53)	2.95–4.07	0.005*
Reduced-fat mayonnaise	1	6.14	—	1	4.20	—	—
All salad dressings	26	8.97 (2.34)	4.57–15.94	21	7.58 (2.05)	3.87–11.11	0.039*
Sandwich	2	6.65 (2.93)	4.57–8.72	2	6.94 (4.34)	3.87–10.01	0.944
Thousand island	8	10.13 (2.83)	7.26–15.94	5	8.92 (2.740)	5.04–11.11	0.431
French	8	9.71 (1.63)	6.84–12.18	8	7.89 (1.86)	4.50–10.33	0.051
Other salad dressings	8	7.63 (1.36)	5.41–9.87	6	6.26 (1.15)	5.55–7.17	0.038*

Significant difference ($P < 0.05$). Replicates = 3 (for all samples). SD = standard deviation.

mayonnaise samples in 2019 were significantly reduced in comparison with samples in 2017. In a study of salt content of foods over a 5-year period (2011–2016) in the Netherlands, the average salt content of 15 samples of 6 brands of emulsion-based sauces collected from local supermarkets was 8% lower compared to the average in 2011, but this reduction was not significant (24). The salt content of our mayonnaise samples in 2017 and 2019 was lower than the sodium content of mayonnaise (868.9 mg/100 g or 2.21 g/100 g salt) and reduced-fat mayonnaise (751.7 mg/100 g or 1.91 g/100 g salt) in Mexico (21) and higher than the sodium content of mayonnaise [603.6 (54.38) mg/100 g or 1.53 (0.14) g/100 g salt] in Malaysia (25). In the current study, total sugar levels of mayonnaise samples in 2017 and 2019 were lower than those of mayonnaise samples [8.59 (1.20) g/100 g] in Malaysia (25).

In our study, total fat levels of salad dressing samples in 2017 and 2019 were higher than those of salad dressing samples (29.85 g/100 g) obtained in 6 different mayonnaise and salad dressings brands in Malaysia (25). The salt content of salad dressing samples in 2017 and 2019 was lower than that salad dressing samples in Malaysia [848.67 (96.92) mg/100 g or 2.16 (0.25) g/100 g salt] (25) and Argentina (1493.4 mg/100 g or 3.79 g/100 g salt) (17). Moreover, in monitoring sodium content of processed food in Argentina, dressings were one of the categories within the sauces and spreads group with the highest median sodium content (950 mg/100 g, 2.41 g/100 g salt). The total sugar levels of salad dressing samples

in 2017 and 2019 were lower than those in salad dressing samples [15.47 (2.40) g/100 g] in Malaysia (25).

Although, the salt contents of none of the mayonnaise samples were compatible with the UK FSA targets (maximum 1.25 g/100 g), 33.3% and 100% of the samples were compatible with COFEPRIS in 2017 and 2019, respectively. Accordingly, the sodium levels of none of the mayonnaise samples in Mexico met the UK FSA targets. However, 59% of the samples were in accordance with COFEPRIS (21). In a study conducted in Argentina based on the nutritional facts on the labels, none of the mayonnaise samples was above the regional sodium target for 2015 (1050 mg/100 g or 2.67 g/100 g salt) and 97.1% were above the lower sodium target (670 mg/100 g or 1.7 g/100 g salt) (17). In recent years there has been a focus on producing reduced-fat and low-cholesterol mayonnaise and salad dressings in different ways, such as using fat substitutes or replacing fat with other natural ingredients (30, 31). Moreover, the impact of food taxation on reduction of sugar, salt and fat in commercial food products has been studied in several countries such as Denmark, United States of America, and Germany, confirming the WHO recommendations for governments using fiscal policies to promote healthy diets in the population (32–35).

Conclusion

Considering the increase in compliance with ISIRI limits for fat content between 2017 and 2019, the results of the current study seem satisfactory. Although there was

Table 4 Compliance of total fat levels in the studied mayonnaise and salad dressing samples with ISIRI limits

Type	Period 1 (2017)		Period 2 (2019)		ISIRI limits (%)
	No.	Compliance (%)	No.	Compliance (%)	
Mayonnaise	6	33.33	4	100	≥ 65
Reduced Fat Mayonnaise	1	100	1	100	40–50
All salad dressings	26	84.6	21	90.5	36–56
Sandwich	2	100	2	100	36–56
Thousand Island	8	75	5	50	36–56
French	8	87.5	8	100	36–56
Other salad dressings	8	87.5	6	83.33	36–56

ISIRI = Institute of Standards and Industrial Research of Iran.

Table 5 Percentages of compliance of the studied mayonnaise and salad dressing samples salt content with UK FSA and COFEPRIS targets

Product	Standard targets		Period 1 (2017)			Period 2 (2019)		
	UK FSA Target g/100 g	COFEPRIS target g/100 g	No.	Compliance with UK FSA (%)	Compliance with COFEPRIS (%)	No.	Compliance with UK FSA (%)	Compliance with COFEPRIS (%)
Mayonnaise	1.25 (max)	1.91	6	0	33.3	4	0	100
Reduced-fat mayonnaise	1.7 (max)	—	1	0	—	1	100	—
Salad dressings	1.5 (max)	—	26	11.5		21	23.8	

COFEPRIS = Federal Commission for Protection against Health Risks; FSA = Food Standard Agency.

a significant reduction in salt and sugar contents of mayonnaise and sugar content of salad dressings from 2017 to 2019, none of the mayonnaise samples met the UK FSA salt targets in either year. Therefore, reformulation of these products for salt reduction is necessary. It is recommended that standard limits for salt and sugar levels in mayonnaise and salad dressings be determined by ISIRI.

The current study was part of a national programme on monitoring nutritional risk factors for NCDs in Iranian food products, and a limited budget was allocated to the study of mayonnaise and salad dressings. The studied samples were well-known and highly consumed brands available in chain stores and supermarkets in Tehran, and did not include less-popular brands with low levels of production that were sold locally and not transported from other cities to Tehran. Therefore, our results are not completely representative of all mayonnaise and salad dressings retailed in the Iranian market. Unlike most other studies, which relied on food labelling, our results were based on chemical analysis of the samples, which was closer to the actual levels of the measured constituents. Future studies covering a wider range of brands and increased sample size will be useful. Moreover, the results of the current study may be used for updating the Iranian Food Composition Table. Generally, food product reformulation, introducing taxes on food and drinks containing high levels of sugar, salt or fat, setting standard limits, suitable methods of food labelling, and health education are effective ways of reducing the risk of NCDs.

Acknowledgement

Étude comparative des teneurs en sel, en graisses totales et en sucre de la mayonnaise et des sauces pour salade du marché iranien

Résumé

Contexte : L'apport alimentaire en graisses, en sel et en sucre est important pour la prévention des maladies non transmissibles ; il est donc nécessaire d'évaluer ces constituants dans les aliments industriels emballés.

Objectifs : Comparer les niveaux de graisse, de sel et de sucre dans la mayonnaise et les sauces pour salade commercialisées en République islamique d'Iran en 2017 et 2019, et surveiller le respect des limites standard.

Méthodes : Les niveaux de graisse, de sel et de sucre dans 12 mayonnaises et 47 échantillons de sauces pour salade collectés sur un marché iranien ont été évalués selon l'Institut iranien des normes et de la recherche industrielle (ISIRI) et comparés entre 2017 et 2019.

Résultats : Nous avons déterminé la conformité aux limites ISIRI et aux autres objectifs standard. La teneur en sel des échantillons de mayonnaise a sensiblement diminué, passant de 2,03 g/100 g (écart type ; 0,3) en 2017 à 1,61 g/100 g (0,12) en 2019 ($p = 0,031$). Le taux de sucre total des échantillons de mayonnaise a significativement diminué, de 5, 97 g/100 g (1,14) en 2017 à 3,63 g/100 g (0,53) en 2019 ($p = 0,005$). Le taux de sucre total des sauces pour salade a considérablement baissé, de 8,97 g/100 g (2,34) en 2017 à 1,58 g/100 g (2,65) en 2019 ($p = 0,039$). La conformité de la teneur en graisse de la mayonnaise et de la sauce pour salade aux limites ISIRI est passée

de 42,9 % et 84,6 % en 2017 à 100 % et 90,5 % en 2019, respectivement. Aucun des échantillons de mayonnaise n'a atteint l'objectif fixé par la British Food Standards Agency pour le sel (au maximum 1,25 g/100 g) en 2017 et 2019.

Conclusions : Il est nécessaire de modifier la formulation de ces produits pour réduire la teneur en sel et en sucre.

دراسة مقارنة لمحتويات المايونيز وصلصات السَلَطَات من الملح وإجمالي الدهون والسكر في السوق الإيرانية

خديجه خوش طينت، باليز كوهى كمالى، رزيتا كميلى فنود، سارا سهراب وندى، كيانوش خسروى دارانى، مهرداد محمدى، حديثه زند رجبى، الميرا توكلى، مهديه صالحى، غزاله بهراميان، زهرا وثوقى

الخلاصة

الخلفية: يُعتبر المدخول الغذائي من الدهون والملح والسكر مهماً من أجل الوقاية من الأمراض غير السارية؛ ومن ثَمَّ، من الضروري تقييم هذه المكونات في الأغذية الصناعية المعبأة.

الأهداف: هدفت هذه الدراسة إلى مقارنة مستويات الدهون والملح والسكر في المايونيز وصلصات السلطات التي جرى تسويقها في جمهورية إيران الإسلامية في عامي 2017 و2019، ورصد الامتثال للحدود المعيارية.

طرق البحث: خضعت مستويات الدهون والملح والسكر في 12 عينة من المايونيز و47 عينة من صلصات السلطات التي جُمعت من إحدى الأسواق الإيرانية للتقييم وفقًا لمعهد المعايير والبحوث الصناعية في إيران وأُجريت مقارنة بينها في عامي 2017 و2019.

النتائج: قررنا الامتثال لحدود معهد المعايير والبحوث الصناعية في إيران والأهداف القياسية الأخرى. ولقد انخفض محتوى الملح في عينات المايونيز من 2.03 (بانحراف معياري؛ 0.3) جرام/ 100 جرام في عام 2017 إلى 1.61 (0.12) جرام/ 100 جرام في عام 2019 (القيمة الاحتمالية = 0.031). وانخفض المستوى الإجمالي للسكر في عينات المايونيز انخفاضًا كبيرًا من 5.97 (1.14) جرام/ 100 جرام في عام 2017 إلى 3.63 (0.53) جرام/ 100 جرام في عام 2019 (القيمة الاحتمالية = 0.005). كما انخفض المستوى الإجمالي للسكر في عينات صلصات السلطات انخفاضًا كبيرًا من 8.97 (2.34) جرام/ 100 جرام في عام 2017 إلى 1.58 (2.65) جرام/ 100 جرام في عام 2019 (القيمة الاحتمالية = 0.039). وارتفع الامتثال لحدود معهد المعايير والبحوث الصناعية في إيران بالنسبة لمحتويات الدهون في منتجات المايونيز وصلصات السلطات من 42.9٪ و84.6٪ في عام 2017 إلى 100٪ و90.5٪ في عام 2019، على التوالي. ولم تستوف أي من عينات المايونيز مستوى الملح المُستهدف وفقًا لوكالة المعايير الغذائية البريطانية (بحد أقصى 1.25 جرام/ 100 جرام) في عامي 2017 و2019.

الاستنتاجات: من الضروري إعادة تركيب محتويات هذه المنتجات لتقليل محتوى الملح والسكر.

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Association of malnutrition and low quality of life among cancer patients receiving chemotherapy, Palestine

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Abstract

Background: Malnutrition is significantly associated with poor clinical outcomes and reduced quality of life among cancer patients. Although the number of cancer patients receiving chemotherapy has increased in Palestine, there has been limited research on the relationship between malnutrition and quality of life.

Aims: To determine the relationship between nutritional status and quality of life of cancer patients receiving chemotherapy at Al-Hussein Governmental Hospital in Biet-Jala, Palestine.

Methods: This cross-sectional study included all the patients receiving chemotherapy between 2018 and 2019. Nutritional status was assessed using anthropometric measurements and biochemical data retrieved from the participating patients' files. The clinical assessment of malnutrition was done using the Subjective Global Assessment, and quality of life was assessed using the European Organization for Research and Treatment of Cancer QLQ-C30 questionnaire version 3.

Results: One hundred patients (79 female, 21 male) were included in the final analysis. The results revealed that 25% of the patients were severely malnourished, and 42% were mildly to moderately malnourished. There was a significant relationship between malnutrition and quality of life in the following domains: physical functioning, cognitive functioning and fatigue.

Conclusions: Malnutrition is prevalent among Palestinian cancer patients receiving chemotherapy, and it is associated with poor quality of life. The results of the study highlight the need for nutritional support programmes for cancer patients to enhance their nutritional status and improve their quality of life.

Keywords: cancer patients, chemotherapy, nutritional status, quality of life, Palestine

Introduction

Cancer is the second leading cause of death worldwide. The global cancer burden had risen to 18.1 million new cases and 9.6 million deaths in 2018. Recent statistics have reported that 1 in 5 men and 1 in 6 women worldwide develop cancer during their lifetime, and one in 8 men and one in 11 women die from cancer (1). In Palestine, cancer is increasingly becoming a public health concern and it is the second most common cause of death. A total of 2536 new cases of cancer were reported in the West Bank in 2016.

Malnutrition is a common problem among cancer patients due to the cancer itself and the adverse effects of cancer treatment (2). The prevalence and severity of malnutrition depend on the tumour stage and site (3). Chemotherapy is aggressive and negatively affects the physical and psychological status of cancer patients, and it has serious adverse effects on their nutritional status (4,5). Moreover, cancer patients undergoing chemotherapy often experience taste and smell changes which affect their dietary intake (6). For these reasons, all cancer patients should be screened regularly for the risk or presence of malnutrition, and to consider nutritional support as a part of the cancer management plan (7). Prevalence of malnutrition varies among countries. For example, in a study conducted in Japan, the prevalence of malnutrition among 152 cancer patients was 19%. In Italy, malnutrition was 9% while nutritional impairment was 51% among 1950 cancer patients in 22 medical centres (8). Among 822 Irish cancer patients, 36% reported body weight loss > 5% (9).

Quality of life (QOL) is an essential aspect of the medical treatment plans involving patients with chronic diseases, and it is considered a clinical measure of health care (10). However, for cancer patients, adverse effects of chemotherapy have a strong impact on QOL (11). The factors that negatively affect QOL of cancer patients are fatigue, anxiety, functional impairments and body image (12).

There is a known relationship between malnutrition and poor QOL in cancer patients (13). Malnourished patients feel weak and tend to stop their usual activities, which, in turn, adversely affects their QOL (14). Chemotherapy-associated weight loss leads to poor physical and social functioning, while weight gain with some treatment regimens is associated with adverse

effects on emotional and social functions (15). It can be inferred that cancer patients with good nutritional status have better QOL during chemotherapy as compared to malnourished patients. Hence, QOL should be regarded as a primary outcome measure for nutritional interventions among cancer patients.

This research aimed to determine the prevalence of malnutrition among Palestinian cancer patients and its relationship with QOL. There is a need for this type of research as the number of cancer cases has been increasing in Palestine.

Methods

This cross-sectional study was conducted at Al-Hussein Governmental Hospital in Biet Jala, West Bank, Palestine. Data collection was conducted through interviews with patients and clinical assessments, and the hospital database provided the cancer patients' profiles and biochemical data. Initially, > 150 patients from the Oncology Day Care Unit were invited to participate. This unit treats patients receiving chemotherapy. Patients who did not consent to the study or refused to continue with the full assessment were excluded. A total of 100 patients were included in the final analysis. The inclusion criteria were patients aged ≥ 18 years who were receiving chemotherapy at Al-Hussein Governmental Hospital from October 2018 to March 2019. The exclusion criteria were: age ≤ 18 years, mental disabilities, and admission to hospital wards or intensive care units.

The Deanship of Scientific Research in the Palestine Polytechnic University gave ethical approval (Ref no. KA/41/2018) for the research protocol. The Palestinian Ministry of Health granted permission to collect the required data. Written consent forms were obtained from the patients after they had been briefed about the purpose of the study.

QOL was assessed using the validated Arabic version of the European Organization for Research and Treatment of Cancer (EORTC) C-30 version 3.0 questionnaire. EORTC C-30 is a widely used and accepted tool to assess QOL of cancer patients. The EORTC C-30 psychometric properties have been examined across cultural samples in 13 countries (16). The Arabic version of EORTC-C30 was validated in neighbouring Lebanon (17). The scoring of each item and the total items was according to the steps reported in the EORTC-C30 manual (18). The reliability of the tool was assessed using Cronbach α coefficient with a value of 0.863.

The Subjective Global Assessment (SGA) tool was used to determine the nutritional status of the participants. SGA is a valid tool widely used to diagnose malnutrition among cancer patients (19). It consists of 2 main sections: nutritional medical history and physical examination for subcutaneous fat and muscle. The nutritional medical history includes weight changes (during the last 6 months and last 2 weeks); dietary intake changes and adequacy; gastrointestinal symptoms (like nausea, vomiting, diarrhoea and anorexia for the last 2 weeks); and functional capacity (if there is any dysfunction or mobility difficulties, and the duration of these difficulties). The physical examination includes clinical assessment for subcutaneous fat (under the eyes, triceps and biceps) and muscle wasting (in the temple, clavicle, shoulder, scapula/ ribs, quadriceps, calf, knee and interosseous muscle between thumb and forefinger), in addition to observation for oedema or ascites. The patients were classified into well-nourished (Category A), moderately malnourished Category B) or severely malnourished (Category C). Well-trained dietitians conducted all the assessments.

Nutritional biochemical assessment using laboratory tests was done on the patients. The relevant data from the hospital databases for each patient were extracted including albumin, complete blood count, creatinine, and blood urea nitrogen. These tests were routine laboratory tests according to the hospital protocols. Data related to cancer stage, location, treatment plan and number of chemotherapy sessions were also extracted from the patients' files.

SPSS version 21 was used for data entry and analysis. Descriptive statistics (frequencies, percentages, means and standard deviations) were carried out. The χ^2 test was performed to determine the association between malnutrition and the independent categorical variables, while the independent samples t test and one-way analysis of variance were used to determine the mean differences for selected variables. $P < 0.05$ was considered significant.

Results

Participants' characteristics

Participants' characteristics are presented in Table 1. The mean age of the participants was 52 (11) years, ranging from 22 to 80 years, with a significant difference between men [61 (15) years] and women [51 (10) years] ($P < 0.01$ using independent samples t test).

The medical history of the participants revealed considerable comorbidity: 20% of the participants had diabetes, 25% hypertension, 8% dyslipidaemia, 3% history of heart diseases, and 62% reported previous operations other than for cancer treatment.

For cancer staging, the patients' files showed 32% of the patients with stage III, 29% stage II, 24% stage 1 and 15% stage IV, with no significant difference between men and women. Metastasis was reported in 11% of patients. Patients with breast cancer formed the majority of the study sample (49%), followed by colon cancer 10%, lymphoma 9%, prostate cancer 4%, and leukaemia 3%. Other cancers were reported to be < 2% (liver, bone, pancreas, stomach and bone cancer). For cancer treatment, 34% of the patients underwent surgery before starting chemotherapy, and 20% received radiotherapy during their treatment plan. In terms of the number of chemotherapy sessions, 16% of the patients had 2–5 sessions, 50% had 6–10, while the rest had > 10.

Table 1 Participant characteristics

Demographic characteristics	Value	No.	%
Sex	Male	21	21
	Female	79	79
Personal status	Married	92	92
	Single	7	7
	Divorced	1	1
Education	Primary	46	46
	Secondary	30	30
	Diploma	11	11
	Postgraduate	13	13
Area of living	Hebron	67	67
	Bethlehem	13	13
	Ramallah	18	18
	Jericho	1	1
	Jerusalem	1	1
Work	Works	18	18
	Does not work	73	73
	Retired	9	9
Smoking	Smoker	13	13
	Non-smoker	83	83
	Ex-smoker	4	4

The patients' nutritional assessment according to SGA showed that 33% of the participants were well-nourished, 42% mildly to moderately malnourished, and 25% severely malnourished, with no significant differences between men and women. There was a significant association between cancer stage and nutritional status: stages 3 and 4 were associated with severe malnourishment compared with stages 1 and 2 ($P < 0.05$, χ^2 test). The nutritional status of the participants according to SGA domains is presented in Figure 1. Severe weight loss (> 10% of body weight) was reported among 31% of the patients, inadequate dietary intake was reported in 22%, and 58% reported limitation in the functional status and mobility. Loss of subcutaneous fat around the eyes, triceps and biceps was 8%, 39% and 38%, respectively. Moderate and severe muscle wasting differed according to the muscle sites. The biochemical data showed that 24% of the participants had low haemoglobin level, and 27% and 20% had low numbers of red blood cells and white blood cells, respectively; 14% had low albumin level; and 7% had high creatinine and blood urea nitrogen levels.

The relationship between nutritional status and QOL is presented in Table 2. Significantly lower functional status was found among severely malnourished patients compared with well-nourished and mild-to-moderately malnourished patients ($P < 0.05$). Severely malnourished patients reported significantly higher fatigue score compared with well-nourished and mild-to-moderately malnourished patients ($P < 0.05$).

The relationship between cancer stage and QOL is presented in Table 3. There was a significantly poor score in most of the 3 QOL domains in patients with advanced cancer ($P < 0.05$), except for dyspnoea, diarrhoea, financial difficulties, social functioning, nausea, and vomiting.
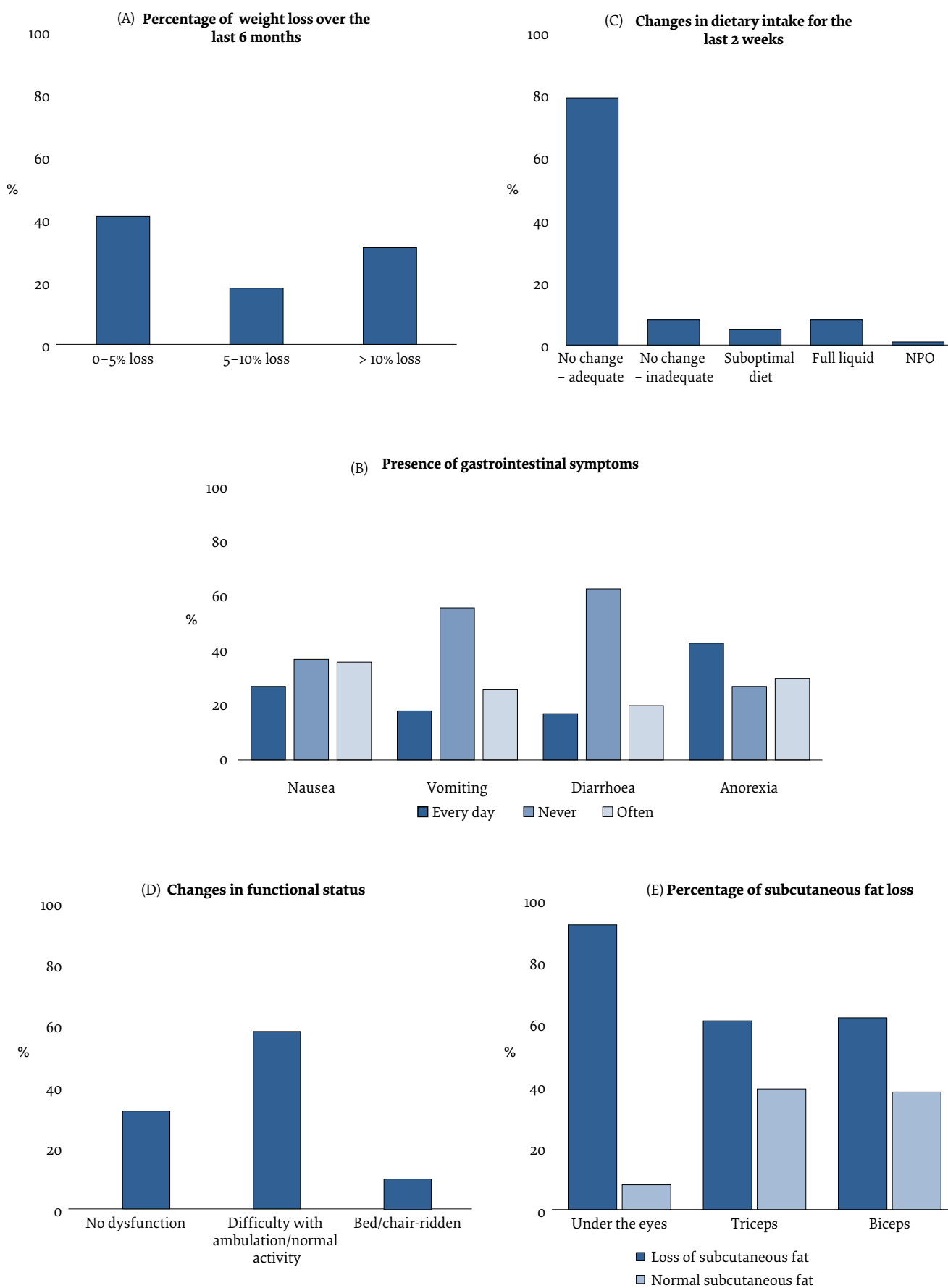
Discussion

This study successfully determined the prevalence of malnutrition (25%) and the risk of malnutrition (42%) among cancer patients during chemotherapy treatment. The prevalence of malnutrition was higher among those with advanced cancer stages. With regard to QOL, malnourished patients had lower functional status and higher fatigue level compared with well-nourished and mildly nourished patients. One hundred patients (79 female and 21 male) were included in the present study. The biochemical data were extracted from the patients' files. Only 44 patients had their albumin measured because this was only indicated in types of cancer with high catabolism, and not for all patients receiving chemotherapy according to the hospital follow-up.

Clinical assessment of the nutritional status revealed that 42% had mild-to-moderate malnutrition (SGA Category B), and 25% were severely malnourished (SGA Category C). This result is consistent with previous studies. For instance, Vergara et al. reported that 40.2% of cancer patients receiving chemotherapy were malnourished, using SGA scoring (20). In a large multicentre study in China, of 23 218 cancer patients receiving chemotherapy, 31.3% were moderately malnourished and 26.5% were severely malnourished using the Patients Generated – Subjective Global Assessment (SGA) to diagnose malnutrition (21). In the Republic of Korea, the prevalence of malnutrition using SGA ranged from 19.8% to 34.5% depending on cancer treatment (22). The considerable prevalence of malnutrition among cancer patients is explained by the metabolic stress levels due to cancer and the adverse effects of treatment, which decreases dietary intake and leads to loss in weight and functional reserve (20).

The relationship between QOL and nutritional status was significant in certain domains of QOL: physical function, cognitive function and fatigue. Malnourished patients scored less for physical and cognitive functions, and scored more for fatigue. Generally, cancer patients' QOL scores are low (23,24). The QOL domains of overall health, physical function and fatigue were highly prevalent among cancer patients with nutritional problems (24). Much research has reported that malnutrition adversely affects QOL among cancer patients receiving chemotherapy (25–28). Moreover, malnutrition adversely affects patients' survival (9). In a cross-sectional study conducted among > 1000 cancer patients, malnutrition was a significant predictor for poor QOL (25). There is a significant relationship between pain from cancer treatment and metabolic changes due to cancer (26). Malnutrition, theoretically and clinically, is associated with low QOL among cancer patients during chemotherapy. Based on these findings, enhancing the nutritional status for cancer patients could improve the clinical outcomes and QOL (28).

The results of the current study revealed that patients with advanced stage 3 and 4 cancer reported lower QOL compared with patients with stages 1 and 2 cancer. The

Figure 1 Patients' nutritional status according to Subjective Global Assessment Domain

(A) **Percentage of weight loss over the last 6 months**

(C) **Changes in dietary intake for the last 2 weeks**

(B) **Presence of gastrointestinal symptoms**

(D) **Changes in functional status**

(E) **Percentage of subcutaneous fat loss**

Figure 1 Patients' nutritional status according to Subjective Global Assessment Domain *(concluded)*

(F) **Muscle wasting**

■ Severe muscle wasting   ■ Mild muscle wasting   □ Normal muscle
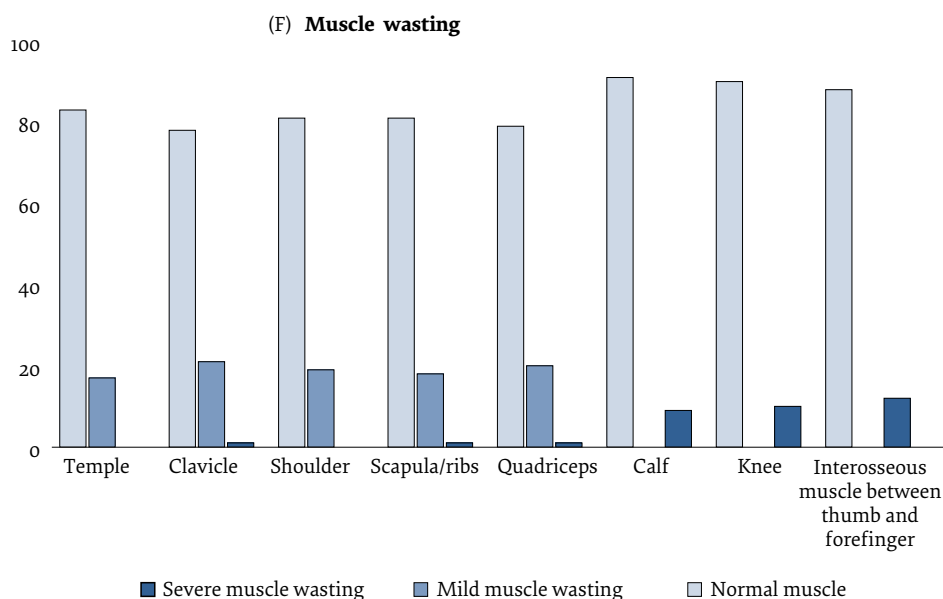
relationship was significant for pain, insomnia and constipation. Patients with stages 3 and 4 cancer scored lower in the global health status domain, and stage 4 cancer patients reported significantly lower scores compared with patients with other stages of cancer. Similarly, the physical, emotional, role functioning and cognitive functions were significantly lower for patients with advanced cancer stages. The incidence of fatigue was significantly higher in stage 4 than in other stages. These findings confirmed the relationship between cancer stage

and QOL. Al Zahrani et al. found a significantly lower QOL for advanced cancer stages among women with breast cancer from Saudi Arabia (*29*). This can be explained by the fact that the severity of cancer symptoms increases with advanced stages, and QOL is determined by severity of disease symptoms. Severe symptoms hinder patients' social roles, with increased levels of irritation, distress and depression, especially in advanced cancer stages (*10*). Malnutrition is also a contributing factor to low QOL. It is well documented that nutritional problems and

Table 2 Relationship between nutritional status according to SGA and quality of life

	Well-nourished (n = 33)	Mildly/moderately malnourished (n = 42)	Severely malnourished (n = 25)	P
Pain	18.1 (20.1)	17.8 (21.5)	26.6 (29.2)	0.277
Dyspnoea	20.2 (28.7)	11.1 (21.6)	12 (25.2)	0.262
Insomnia	44.4 (39.6)	40.4 (42.6)	58.6 (40)	0.209
Appetite loss	29.2 (34.1)	37.3 (28.7)	46.6 (37.2)	0.141
Constipation	13.1 (21.9)	19 (27.6)	21.3 (28.6)	0.453
Diarrhoea	11.1 (23)	14.2 (26.6)	21.3 (33.1)	0.365
Financial difficulties	13.1 (23.4)	15 (26.7)	9.3 (26.3)	0.675
Global health status	69.4 (16.7)	65 (15)	59 (16.8)	0.055
Physical functioning	65.8 (20.4)	72.3 (17.6)	58.6 (25.6)	0.035
Role functioning	83.3 (23.1)	88.8 (19.7)	83.3 (29.2)	0.510
Emotional function	63.3 (28.5)	71.2 (30.5)	59.3 (33.4)	0.273
Cognitive functioning	70.7 (29.1)	86.5 (19.9)	66 (25.6)	0.002
Social functioning	87.3 (19.5)	80.1 (25)	82.6 (20.1)	0.376
Fatigue	38.3 (27)	35.9 (26.8)	54.2 (27.2)	0.024
Nausea, vomiting	18.6 (24.9)	20.2 (21.6)	18.6 (22.2)	0.945

Results presented as mean (standard deviation). SGA = Subjective Global Assessment.

Table 3 Relationship between cancer stages and quality of life presented in mean (SD)

	Stage 1	Stage 2	Stage 3	Stage 4	P
Pain	14.5 (22.1)	10.9 (15.6)	26 (21.9)	34.4 (31.1)	0.003
Dyspnoea	15.2 (29.4)	10.3 (23.7)	15.6 (22.3)	17.7 (27.7)	0.776
Insomnia	34.7 (38.6)	42.5 (38.7)	42.7 (41.6)	80 (35.1)	0.005
Appetite loss	26.3 (31)	41.3 (34.1)	33.3 (32.7)	53.3 (30.3)	0.069
Constipation	18 (31)	20.6 (27.3)	8.3 (14.6)	31.1 (29.4)	0.035
Diarrhoea	9.7 (20.8)	17.2 (29)	17.7 (29.3)	13.3 (30.3)	0.699
Financial difficulties	15.2 (27.7)	12.6 (25.8)	12.5 (21.9)	11.1 (29.9)	0.963
Global health status	68 (15)	67.8 (14.8)	66.9 (15.4)	50.5 (17)	0.002
Physical functioning	68 (22.9)	77.7 (16.7)	62.9 (19)	52 (21.4)	0.001
Role functioning	90.2 (19.6)	91.3 (19.2)	83.3 (23.1)	72.2 (31.9)	0.046
Emotional functioning	58.3 (31.5)	74.4 (29.3)	73.1 (26.8)	44.4 (29.6)	0.004
Cognitive functioning	81.2 (24.2)	79.8 (22.4)	77.6 (26.6)	57.7 (28.7)	0.026
Social functioning	84 (21.6)	85.6 (22.5)	83.8 (19.1)	75.5 (28)	0.539
Fatigue	37.5 (25.5)	31.4 (27.5)	44 (28)	60.7 (22.1)	0.007
Nausea, vomiting	17.3 (21.6)	24.7 (23.8)	14.5 (21.4)	22.2 (24.1)	0.330

Results presented as mean (standard deviation).

malnutrition increase with advanced cancer stages (*30*); therefore, lower QOL scores among patients with stage 4 compared with stages 1 and 2 are to be expected (*10*).

This study had some limitations. The study was conducted in a single medical centre on a small sample. The inclusion criteria included different types and stages of cancer. The study design was cross-sectional, which only defined the relationship between QOL and malnutrition without determination of the cause and effect relationship.

Conclusions

The results revealed that 25% of the patients were severely malnourished and 42% were mildly to moderately malnourished. A significant association was found between cancer stage and nutritional status, with higher stages associated more with being severely malnourished. Sig-

nificantly lower functional status, higher fatigue levels and lower QOL scores were found among severely malnourished cancer patients compared with well-nourished and mildly to moderately malnourished patients. The results highlight the need for routine nutritional assessment of all patients referred for chemotherapy. Likewise, the study provides evidence of the importance of early nutritional intervention programmes for cancer patients receiving chemotherapy to enhance their nutritional status and improve their QOL. Further research is needed to determine the cause and effect relationship between malnutrition and QOL in longitudinal prospective design. Furthermore, intervention studies are needed to optimize the nutritional intervention protocol among Palestinian cancer patients receiving chemotherapy.

Association de la malnutrition et de la mauvaise qualité de vie chez les patients cancéreux sous chimiothérapie, Palestine

Résumé

Contexte : La malnutrition est associée de manière significative à de mauvais résultats cliniques et à une qualité de vie réduite chez les patients cancéreux. Bien que le nombre de patients cancéreux sous chimiothérapie ait augmenté en Palestine, les recherches sur le lien entre malnutrition et qualité de vie ont été limitées.

Objectifs : Déterminer la relation entre l'état nutritionnel et la qualité de vie des patients cancéreux recevant une chimiothérapie à l'hôpital public Al-Hussein de Biet-Jala, en Palestine.

Méthodes : La présente étude transversale incluait tous les patients sous chimiothérapie entre 2018 et 2019. L'état nutritionnel a été évalué à l'aide de mesures anthropométriques et de données biochimiques tirées des dossiers des patients participant. L'évaluation clinique de la malnutrition a été réalisée à l'aide de l'évaluation globale subjective, et la qualité de vie a été déterminée à l'aide de la version 3 du questionnaire QLQ-C30 de l'Organisation européenne pour la recherche et le traitement du cancer.

Résultats : Cent patients (79 femmes, 21 hommes) ont été inclus dans l'analyse finale. Les résultats ont révélé que 25 % des patients souffraient de malnutrition sévère, et 42 % de malnutrition légère à modérée. Il existait une relation

significative entre la malnutrition et la qualité de vie dans les domaines suivants : le fonctionnement physique, le fonctionnement cognitif et la fatigue.

Conclusions : La malnutrition est prévalente chez les patients palestiniens atteints de cancer et elle est associée à une mauvaise qualité de vie. Les résultats de l'étude soulignent la nécessité de programmes de soutien nutritionnel pour les patients atteints de cancer afin d'améliorer leur état nutritionnel et leur qualité de vie.

الارتباط بين سوء التغذية وانخفاض جودة الحياة في صفوف مرضى السرطان الذين يتلقون معالجة كيميائية، فلسطين

منال بدرساوي، أسيل الأدهم، أسيل دوفيش

الخلاصة

الخلفية: يرتبط سوء التغذية ارتباطًا كبيرًا بضعف المخرجات السريرية وانخفاض جودة الحياة في صفوف مرضى السرطان. وعلى الرغم من أن عدد مرضى السرطان الذين يتلقون معالجة كيميائية قد زاد في فلسطين، إلا أن البحوث المعنية بالعلاقة بين سوء التغذية وجودة الحياة كانت محدودة.

الأهداف: هدفت هذه الدراسة إلى الوقوف على العلاقة بين الوضع التغذوي وجودة الحياة بالنسبة لمرضى السرطان الذين يتلقون معالجة كيميائية في مستشفى الحسين الجامعي في بيت جالا، فلسطين.

طرق البحث: شملت هذه الدراسة المقطعية جميع المرضى الذين تلقوا معالجة كيميائية في الفترة بين عامي 2018 و2019. وخضع الوضع التغذوي للتقييم باستخدام القياسات الأنثروبومترية والبيانات البيوكيميائية التي استُخلصت من ملفات المرضى المشاركين. وأجري التقييم السريري لسوء التغذية باستخدام التقييم العالمي الذاتي، بينما أجري تقييم جودة الحياة باستخدام النسخة الثالثة من استبيان المنظمة الأوروبية لبحوث وعلاج السرطان (QLQ–C30).

النتائج: شمل التحليل النهائي مائة مريض (79 من الإناث، و21 من الذكور). وكشفت النتائج عن أن 25٪ من المرضى كانوا يعانون من سوء تغذية حاد، و42٪ كانوا يعانون من سوء تغذية متوسط إلى معتدل. وكانت هناك علاقة قوية بين سوء التغذية وجودة الحياة في المجالات التالية: الأداء البدني، والأداء المعرفي، والإرهاق.

الاستنتاجات: ينتشر سوء التغذية بين مرضى السرطان الفلسطينيين الذين يتلقون معالجة كيميائية، ويرتبط بتردِّي جودة الحياة. وتُسلط نتائج الدراسة الضوء على الحاجة إلى برامج دعم تغذوي لمرضى السرطان لتحسين وضعهم التغذوي وتحسين جودة الحياة بالنسبة لهم.

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Nutrient intakes and adequacy among preschool children under blockade in Gaza City, Palestine

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Abstract

Background: After 13 years of blockade and closure, malnutrition has become a significant risk to the health of Gaza's youngest residents. According to recent national surveys, Palestinians are facing a double burden of malnutrition and very low levels of essential minerals and vitamins.

Aims: The aims of this study were to assess nutrient intake adequacy among preschool children and to estimate the dietary and nutrient intake deficiency in the Gaza Strip.

Methods: This cross-sectional, community-based, household survey was carried out in Gaza using 24-hour dietary recall to assess nutrient intake and adequacy among 176 children aged 2–5 years.

Results: Based on the nutrient deficiency for dietary intake [< 75% recommended dietary allowance (RDA)], energy shows the highest level of deficiency (89.8%) in the diet among the studied children followed by vitamin A intake (86.9%). About three quarters (73.3%) of the children studied consumed less than the RDA for calcium and 47.2% consumed less than the RDA for iron. Approximately 20% of the children consumed less than the RDA level of dietary intake for carbohydrate and 17% for zinc.

Conclusion: Nutrient intake among preschoolers in the Gaza Strip shows a dramatic deterioration in macro- and micronutrient deficiency, especially in rural areas. Although the findings in this study are in line with previous reports, it revealed greater deterioration than previous local studies.

Keywords: nutrient intake, preschool children,, recommended dietary allowance, Palestine

Introduction

The Gaza Strip is divided into 5 governorates, North Gaza, Gaza City, Deir Al Balah, Khan Yunis, and Rafah. The localities have been classified into 3 types: urban, rural, and camp (1). Gaza City has one refugee camp (Al- Shati Refugee Camp), one rural area (Al-Moghraga) and the rest of the districts in the city are considered urban areas.

Living conditions in Gaza are deteriorating at an alarming and unprecedented rate. Record high levels of unemployment have compounded the widespread prevalence of poverty, significantly reducing people's purchasing power and further restricting their access to food (2). The coping strategies of the most vulnerable population in Gaza revealed an inappropriate diet in terms of variety and daily intake. Only 14% of children under 5 years of age had the minimum acceptable diet (3).

The blockade and 3 major escalations of hostilities over recent years have increased frustration and exacerbated the vulnerability of the 2 million Palestinians living in the Gaza Strip. Chronic power deficits disrupt basic services such as education, health, nutrition and water, sanitation and hygiene (4). Since the blockade and closure, malnutrition has become a significant risk to the health of Gaza's youngest residents (5). Decades of occupation in the West Bank coupled with a ten-year old blockade and slow recovery in Gaza following the 2014 war have been undermining the living conditions of Palestinians. The recurrent violence and economic stagnation, has further exacerbated vulnerabilities and the capacity of poor Palestinians to access sufficient quantities of nutritious food (6). Gaza has the highest unemployment rate in the world: youth unemployment topped 60% in 2017. Nearly 80% of the population is dependent on international aid (7).

According to recent national surveys, Palestinians are facing a double burden of malnutrition: a high level of micronutrient deficiencies alongside growing overweight and obesity. Approximately 50% of the people assessed had very low levels of essential minerals and vitamins. Depleted iron levels were found in 28% in the Gaza Strip. According to the World Health Organization (WHO) standards, anaemia among children in Gaza Strip is a moderate public health problem (8).

The purpose of this study was to assess the adequacy of nutrient intakes among preschool children in the Gaza Strip, Palestine. The study objectives include the assessment of the child's macro- and micronutrient intake and to estimate dietary and nutrient intake deficiency by age and locality.

Methods

Sampling

This community-based, cross-sectional study was conducted during the first half of 2018 in Gaza City. The sample included urban, rural and refugee camp children aged 2–5 years. We used a multistage, stratified, cluster sampling technique with probability proportionate to the size of the population in the first stage and a constant number of children per cluster in the second stage. The sampling frame was Gaza City. It was divided into 12 primary sampling units, 7 of which (Al-Shati Ref Refugee Camp, Al-Moghraga rural area, Al-Sheikh Radwan, Al-Shagaia, Al-Sabra, Al-Zitoon and Al-Twfah) were randomly selected for this study.

The sample size was calculated by assuming the prevalence rate of deficiency at 50%, a confidence interval of 95%, a precision of 5% and design effect of 2. By using a systematic random sampling methods for a subsample (every fifth household) where a certain number of households (selected randomly in the field) were visited and used to express the actual sample size of the study that computed at 25 children from each area, with total actual sample size at 175 children, with one eligible child selected from every household.

The quota sampling method was used with a fixed number of children in each area. From each of the 7 areas, 25 children were selected. The data collecting teams kept selecting households in the cluster until the specified number of children was reached, regardless of the number of households visited. The teams had a target number of children to reach, so where there were no children in a household, they skipped that and visited the neighbouring household.

Accordingly, 25 households were selected from each area, with one child selected from each household giving a total of 175. However, in one household 2 children of the relevant age were selected, giving an actual sample size of 176 children with a response rate of 100%.

Dietary intake questionnaires

A pre-designed structured interview questionnaire was used to assess the dietary intake pattern of the children. A quantitative dietary intake questionnaire of the 24-hour diet recall was used to assess the child's quantitative dietary intake (9). Three teams carried out the data collection; each team comprised 2 qualified nurses. All the teams had good previous experience in filling out the 24 hour-food recall questionnaire. The child's food intake was collected by asking the mother about the quantities of food consumed during the previous day for main meals and snacks.

In line with ethical research principles, the interviewed mothers received a complete explanation of the study and a consent form for the optional decision to participate in the study.

The 24-hour diet recall methodology was based on the food intake booklet developed and modified by Al-Quds University, with pictures of Palestinian dishes that varied in volume, size, and weight, and common Middle Eastern recipes. The adapted methodology was based on the food intake booklet of the United States Department of Agriculture (10).

The daily intake (grams) from the different food items and groups was computed for all 176 preschoolers in the sample using the food intake booklet. The energy and energy-yielding nutrient content of the diet as well as selected micronutrients were defined by quantity based on the 2006 food composition table for Egypt to obtain the mean daily nutrient intake (11).

Protein, fat and iron were classified according to animal and vegetable sources in data management. Energy, measured by calorie consumption, and the macronutrient protein, fat and carbohydrate were computed in grams, while the micronutrients calcium, iron and zinc were computed in milligrams, except for vitamin A, which was computed in micrograms of retinol (μg RE).The recommended dietary allowance (RDA) for each macro- or micronutrient indicated by the American Food and Nutrition Board were used as the reference for the percentage nutrient intake deficiency below 75% of the RDA (12).

- The ratios for animal protein, animal fat and animal iron to total protein, fat and iron intake were calculated.

- Energy, and macro- and micronutrient adequacy intake were defined by dividing the estimated intake of each child by the RDA for each age group and computed by locality.

- Dietary quality was calculated from the proportion of energy coming from animal food sources and the mean dietary quality was estimated.

- The mean nutrient density for protein, fat and carbohydrate out of the total energy intake for each age group was estimated.

Statistical analysis

Data entry, management and analysis were performed using *SPSS*, version 20.0. Data were checked for data entry errors and validated by checking for valid response categories. Frequency distribution was generated for all variables and for quantitative variables, mean (±SD) was calculated. Independent-samples *t*-test to compare the mean differences in daily intake of macro- and micronutrients between age groups was used. For all analyses, statistical significance was set at $P < 0.05$.

Results

Localities

The total sample was 176 children, 96 (55%) boys and 80 (45%) girls. The sample was collected from 7 districts (3 types of locality) in Gaza City: one rural area (Al-Moghraga), one refugee camp (Al Shata) and 5 urban districts. The sample ages were: 114 children aged 2–< 4 years and

62 children aged 4–5 years, with mean age 42.4 (SD 10.2) months.

Child's nutrient intake

Macro and micronutrient consumption

Daily intake for energy, carbohydrate, total protein, total fat and animal fat consumption were statistically significantly higher among the older age group (Table 1). Total mean daily energy intake was 908.3 (SD 224.9) kcal, with the older age group children consuming significantly more energy than the younger age group [971.0 (SD 220.5) vs 874.3 (SD 220.9) kcal; t = 2.77, P = 0.006]. The total daily carbohydrate intake was 127.9 (SD 32.0) g for the whole sample, with the older age group consuming significantly more carbohydrate than the younger age group [135.5 (SD 30.9) vs 123.8 (SD 31.9) g; t = 2. 34, P = 0.020].

The total daily protein consumption was 29.2 (SD 8.5) g, with the older age group consuming significantly more protein [31.2 (SD 8.2) vs 28.1 (SD 8.5) g, t = 2.33, P = 0.013) than the younger age group (Table 1). The total daily fat intake was 31.1 (SD 12.6) g, with the older age group consuming significantly more fat than the younger age group [33.8 (SD 12.8) g vs 29.6 (SD 12.4) g, = 2.12, P = 0.035]. The total mean animal fat intake was 11.8 (SD 8.7) g, with the older age group consuming significantly more animal fat than the younger age group [13.7 (SD 9.3) g vs 10.8 (SD 8.2) g, t = 2.15, P = 0.032].

Other micro- and macronutrients showed similar results, with the older age group consuming slightly greater amounts, except for calcium where the younger children consumed slightly more than the older ones. However none of these differences was statistically significant (Table 1)

Nutrient density of the consumed diet

Mean protein density ratio was 13.0 (SD 3.0) in the consumed diet, with the fat density ratio 30.0 (SD 8.3) and the carbohydrate density ratio 56.9 (SD 8.7) (Table 2). The protein and fat density ratios in the younger age group were almost the same as in the older age group while the carbohydrate density was slightly higher (57.3 (SD 9.1) vs 56.3 (SD 8.1).

Adequacy of the consumed diet

Macro and micronutrient deficiency

Table 3 describes the proportion of children in the sample whose dietary intake for a given nutrient was less than 75% of the RDA, thus defining the extent of macro- and micronutrient deficiency for the targeted preschool children.

The highest levels of deficiency (< 75% of RDA) among the preschool children in this study were seen for energy, vitamin A and calcium. Overall, energy deficiency was 89.8%; greater deficiency was seen in the diet of the older children (93.5%) than the younger age group (87.7%). For vitamin A intake, overall deficiency was 86.9%, slightly higher among the older children. Just over 73% of the children consumed < 75% of the RDA for calcium in their

Table 1 Daily intake of macro- and micronutrients by age among preschool children in Gaza city, 2018

Nutrient	Age (months)				Total (n = 176)		Test of significance	
	24–< 48 (n = 114)		48–60 (n = 62)					
	Mean	SD	Mean	SD	Mean	SD	t	P-value
Total energy (kcal)	874.3	220.9	971.0	220.5	908.3	224.9	2.77	0.006*
Carbohydrate (g)	123.8	31.9	135.5	30.9	127.9	32.0	2.34	0.020*
Total protein (g)	28.1	8.5	31.2	8.2	29.2	8.5	2.33	0.013*
Animal protein (g)[a]	11.7	9.1	13.9	8.0	12.5	8.8	1.53	0.126
Plant protein (g)	16.2	5.2	17.3	4.6	16.6	5.1	1.35	0.178
Total fat (g)	29.6	12.4	33.8	12.8	31.1	12.6	2.12	0.035*
Animal fat (g)[b]	10.8	8.2	13.7	9.3	11.8	8.7	2.15	0.032*
Plant fat (g)	18.8	10.6	20.0	12.7	19.2	11.4	0.67	0.498
Calcium (mg)	312.0	188.1	300.2	165.4	307.8	180	0.41	0.680
Zinc (mg)	4.2	1.4	4.6	1.2	4.4	1.4	1.86	0.063
Total iron (mg)	6.7	2.4	7.3	2.8	6.9	2.6	1.35	0.179
% animal foods energy to total energy	16.1	11.8	18.6	11.7	17.05	11.8	1.13	0.257
							z	P-value
Animal iron (mg)[c]	1.2	1.9	1.0	1.0	1.1	1.6	0.56	0.574
Plant iron (mg)	6.1	5.3	6.2	2.7	6.1	4.5	1.37	0.168
Vitamin A (μg RE)	169.3	333.2	148.7	153.9	162	283	0.58	0.561

[a]Ratio of animal protein to total protein intake 42.8%.
[b]Ratio of animal fat to total fat intake 37.9%.
[c]Ratio of animal iron to total iron intake15.9%.
t = independent samples t-test.
z = Mann–Whitney test.

Table 2 **Nutrient density ratio according to age among preschool children in Gaza city, 2018**

Nutrient density ratio	Age (months)				Total (n = 176)	
	24–< 48 (n = 114)		48–60 (n = 62)			
	Mean	SD	Mean	SD	Mean	SD
Protein	13.0	3.1	13.0	2.8	13.0	3.0
Fat	29.6	8.5	30.7	7.8	30.0	8.3
Carbohydrate	57.3	9.1	56.3	8.1	56.9	8.7

dietary intake, and the deficiency was slightly greater among the older age group (Table 3). Iron, carbohydrate, zinc and protein also showed dietary deficiency, generally the values for these were under 50%, except for iron deficiency in the older age group (53.2%). For protein, the level of deficiency was under 10%.

Macro- and micronutrient adequacy by locality

Table 4 describes the proportion of preschool children in the sample whose dietary intake for a given nutrient was less than 75% of the RDA, thus defining the extent of macro- and micronutrient deficiency according to locality.

The energy intake deficiency (< 75% of RDA) among the preschool children in this study was greater in urban (90.5%) and rural (90.0%) areas compared with refugee camp children (85.0%) (Table 4). However, the greatest prevalence of vitamin A intake deficiency was among the refugee camp children (95.0%), followed by urban children (88.1%). The highest prevalence of calcium intake deficiency was recorded in the children in the rural area (76.7%), closely followed by the urban area children (73.8%). Generally, deficiency levels for iron, carbohydrate and zinc were < 50%, although iron deficiency was 63.3% among the rural children. The proportion showing protein deficiency was ≤ 10%, and all children in the refugee camp met their protein adequacy. Adequate dietary intake among the children was the worst in the rural area relative to the other locations for all nutrients except vitamin A: the refugee camp shower the worst deficiency for this (Table 4).

Discussion and conclusion

The aim of this study was to assess nutrient intakes and adequacy among preschool children in Gaza, which has been under blockade for more than 13 years. The findings show that energy had the highest dietary deficiency among the studied preschool children, followed by vitamin A intake. There was a dramatic deterioration in macro- and micronutrient adequacy, especially in the rural area. The finding show a higher deficiency rate for energy (90%) than was found in previous local studies (13,14). Jildeh's study pointed out that, among adolescents of East Jerusalem, 55.6% of boys and 64.8% of girls had energy deficiency (13) whereas the 2009 survey by Abdeen et al. in Palestine found that the energy intake deficiency among children aged 3–9 years was about 66% (14).

The data for vitamin A in this study indicates a higher deficiency (overall 86.9%) than was found in a 2015 study in Palestine in which the reported prevalence of intake inadequacy was 63% among children (15). The higher dietary intake deficiency in the current study may reflect the geographical difference in the implementation of the studies between the Gaza Strip and the West Bank: the worst deterioration in energy and vitamin A intakes in the Gaza Strip may be attributed to the continuous restrictions and blockade by Israel on Gaza and the difficult economic situation over the past 14 years. Additionally, some differences may be related to differences in the assessment methods used, the age groups studied and the different sample sizes.

The finding for iron deficiency in this study is in line with the study of Mirmiran, who reported the prevalence of iron deficiency anaemia to be a major public health problem in the Eastern Mediterranean countries, and the highest rates of deficiency were among preschool children (16). It is worth mentioning that more than half the studied students had zinc intake deficiency and this result is higher than the values found in other recent regional and local studies (17,18).

Animal iron intake was lower than plant source iron intake among the children in this study, which is compatible with the 2017 findings of Hwalla et al. for the Middle East (17). These findings could be explained by a higher consumption of protein from plant sources, especially bread, which is considered the main staple food for the people of Palestine.

Findings for nutrient deficiency in the rural area, which was the worst locality for the nutritional status of preschoolers in the Gaza Strip, corresponds with the results of previous reports from the Israeli human rights group Gisha (19) and from Radi et al. (20). These findings were confirmed by previous studies (21,22) and in the Guardian newspaper's report entitled "Israel used 'calorie count' to limit Gaza food during blockade, critics claim" (19). In the same context, the findings relating to nutrient

Table 3 **Proportion of macro- and micronutrient deficiency (i.e. below the 75% recommended dietary allowance level of dietary intake for a given nutrient) distributed by age among preschool children in Gaza city, 2018**

Nutrient	Age (months)		Total (n = 176)
	24–< 48 (n = 114)	48+ (n = 62)	
	Deficiency		
	%	%	%
Energy	87.7	93.5	89.8
Vitamin A	86.0	88.7	86.9
Calcium	69.3	80.6	73.3
Iron	43.9	53.2	47.2
Carbohydrate	24.6	11.3	19.9
Zinc	17.5	16.1	17.0
Protein	2.6	8.1	4.5

Table 4 Proportion of macro and micronutrient deficiency (i.e. below the 75% recommended dietary allowance level of dietary intake for a given nutrient) distributed by locality among preschool children in Gaza city, 2018

Nutrient	Locality		
	Urban (*n* = 126)	Refugee camp (*n* = 20)	Rural (*n* = 30)
	%	%	%
Energy	90.5	85.0	90.0
Vitamin A	88.1	95.0	76.7
Calcium	73.8	65.0	76.7
Iron	46.0	30.0	63.3
Carbohydrate	19.8	10.0	26.7
Zinc	15.1	20.0	23.3
Protein	4.0	0.0	10.0

deficiency intake in the present study are higher than those found in a regional study in Saudi Arabia (*23*). Also, it is notable that most of the macro- and micronutrient adequacy intake reported in this study showed greater deterioration than found in previous research (*21*) and in a report from the World Food Programme (*8*).

The findings in this study are in line with the results of the recent survey from UNICEF, Save the Children and the World Food Programme (*24*), which revealed that the poor food consumption score was worse (23%) compared with national results, which showed that 7% of households in the Gaza Strip had a poor food consumption score in 2016, reflecting the worsening situation among the assessed populations. The current coping strategies of the population show a deterioration in the diet in terms of variety and frequency. The disaggregation of nutrient-rich foods shows concerns around the consumption of iron-rich foods, and partially around vitamin A-rich foods. It is reasonable to assume that the deterioration in nutritional status in the Gaza Strip is a result of the Israeli blockade and tightening of restrictions on the movement of people and goods, as reported in a number of international, regional and local reports (*22,24,25*).

The worst results in this study could be explained by a new World Bank report, which shows that the economy in Gaza is collapsing, suffering from a decade long blockade and a recent drying up of liquidity, with aid flows no longer enough to stimulate growth. While the blockade is the core issue, a combination of factors has more recently impacted the situation in Gaza, including the decision of the Palestinian Authority to reduce the monthly payments to the area, the winding down of monetary aid per year from the US Government aid programme, and the cuts to the United Nations Relief and Works Agency programme (*26*).

This study is strongly recommended along with other national, regional and local reports that strongly call for the need to lift the siege imposed by the Israeli occupation forces on the Gaza Strip (*27–29*). They emphasize the need for a balanced approach to the situation in Gaza that combines an immediate crisis response to ensure the continuation of key services such as energy, water, education and health. These basic services are critical for people's livelihoods and for the economy to function. Another urgent need is to increase household purchasing power to enable a return to basic economic activity, which will contribute positively to the health and nutritional status of people in the Gaza Strip, particularly the vulnerable groups.

Every study has limitation and there are 2 major limitations in this study that could be addressed in future research. First, the study focused on selecting a subsample from the total calculated sample size; this yielded a small sample size in order to avoid using up too many resources, e.g. human, time and financial resources, and to address the issue in a relatively short space of time. Although, there is nothing wrong with conducting well-designed small studies, addressing more-targeted children and governorates in the Gaza Strip is recommended in future studies.

The second limitation concerns accessing the targeted households without a stable means of transportation to collect the required data and navigate between districts and regions. Accordingly, it is recommended that any future field study should provide dedicated transportation for the research teams and for the purpose of visits and data collection through the fieldwork, with transportation reserved for this purpose.

Apports nutritionnels et adéquation des nutriments chez les enfants d'âge préscolaire sous blocus à Gaza, Palestine

Résumé

Contexte : Après 13 ans de blocus et de fermeture, la malnutrition est devenue un risque significatif pour la santé des habitants les plus jeunes de Gaza. Selon de récentes enquêtes nationales, les Palestiniens sont confrontés à une double charge de malnutrition et connaissent de très faibles niveaux de minéraux et de vitamines essentiels.

Objectifs : La présente étude avait pour objectif d'évaluer l'adéquation de l'apport en nutriments chez les enfants d'âge préscolaire et d'estimer les carences alimentaires et nutritionnelles dans la Bande de Gaza.

Méthodes : La présente enquête transversale, communautaire et auprès des ménages a été réalisée à Gaza en utilisant des rappels alimentaires de 24 heures pour évaluer l'apport en nutriments et leur adéquation chez 176 enfants âgés de deux à cinq ans.

Résultats : D'après la carence en nutriments par rapport à l'apport alimentaire [< 75 % de l'apport journalier recommandé (AJR)], l'énergie présente le niveau de carence le plus élevé (89,8 %) chez les enfants étudiés, suivi de l'apport en vitamine A (86,9 %). Environ trois quarts (73,3 %) des enfants étudiés consomment moins que l'AJR pour le calcium, 47,2 % de moins pour le fer, 20 % de moins pour l'apport alimentaire en glucides et 17 % de moins pour le zinc, respectivement.

Conclusions : L'apport en nutriments chez les enfants d'âge préscolaire de la Bande de Gaza montre une détérioration spectaculaire des carences en macro- et micronutriments, en particulier dans les zones rurales. Bien que les résultats de la présente étude soient conformes aux rapports précédents, ils ont révélé une détérioration plus importante que les études locales précédentes.

مدخول المغذيات وكفايتها بين الأطفال الذين هم دون سن المدرسة ويعيشون تحت الحصار في مدينة غزة، فلسطين

سمير راضي

الخلاصة

الخلفية: بعد 13 عامًا من الحصار والإغلاق، أصبح سوء التغذية يُشكل خطرًا كبيرًا على صحة سكان غزة الأصغر سنًّا. ووفقًا لمسوحات وطنية أجريت مؤخرًا، يواجه الفلسطينيون عبئًا مزدوجًا من سوء التغذية ومستويات متدنية للغاية من المعادن والفيتامينات الأساسية.

الأهداف: هدفت هذه الدراسة إلى تقييم مدى كفاية مدخول المغذيات بين الأطفال الذين هم دون سن المدرسة، وتقييم النظام الغذائي ونقص مخزون المغذيات في قطاع غزة.

طرق البحث: أُجري هذا المسح المجتمعي المقطعي للأسر في غزة باستعراض النظام الغذائي على مدار 24 ساعة لتقييم مدخول المغذيات وكفايتها بين 176 طفلاً تتراوح أعمارهم بين عامين إلى خمسة أعوام.

النتائج: استنادًا إلى نقص المغذيات في المدخول الغذائي [< 75٪ من المدخول الغذائي الموصى به]، تُظهر الطاقة أعلى مستوى من النقص (89.8٪) في النظام الغذائي بين الأطفال الذين شملتهم الدراسة يليها المدخول من فيتامين أ (86.9٪). وقد استهلك نحو ثلاثة أرباع الأطفال الذين شملتهم الدراسة (73.3٪) معدلاً أقل من المدخول الغذائي الموصى به للكالسيوم، واستهلك 47.2٪ منهم معدلاً أقل من المدخول الغذائي الموصى به للحديد. واستهلك نحو 20٪ من الأطفال مستوى أقل من المدخول الغذائي الموصى به للكربوهيدرات، واستهلك 17٪ من الأطفال مستوى أقل من المدخول الغذائي الموصى به للزنك.

الاستنتاجات: يُبين مدخول المغذيات بين الأطفال الذين هم دون سن المدرسة في قطاع غزة حدوث تدهور كبير في نقص المغذيات الكبيرة المقدار والزهيدة المقدار، لاسيما في المناطق الريفية. وعلى الرغم من أن نتائج هذه الدراسة متوافقة مع التقارير السابقة، إلا أنها كشفت عن تدهور أكبر مقارنة بالدراسات المحلية السابقة.

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Association between mode of delivery and breastfeeding practices in Egypt: secondary analysis of Egypt Demographic and Health Survey

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Abstract

Background: The rise in caesarean deliveries constitutes a major public health concern in low- and middle-income countries (LMICs). Evidence on the influence of caesarean delivery on breastfeeding practices in LMICs is currently lacking.

Aims: To examine the association between mode of delivery and breastfeeding initiation and prelacteal feeding practices in a nationally representative sample of Egyptian women.

Methods: A cross-sectional study was carried out on 3773 women from the 2014 Egypt Demographic and Health Survey. The outcomes of interest were the timing of breastfeeding initiation and prelacteal feeding practices. Descriptive statistics and multivariable logistic regression models were performed.

Results: Overall, 25.1% of mothers initiated breastfeeding within 1 hour of birth and 63.5% practised prelacteal feeding within 3 days of birth. Mothers who had caesarean delivery had higher odds of delayed breastfeeding initiation [adjusted odds ratio (AOR) 2.25; 95% confidence interval (CI): 1.84–2.74] and were more likely to engage in prelacteal feeding (AOR: 1.44; 95% CI, 1.19–1.74). Moreover, the relationship between caesarean delivery and delayed breastfeeding initiation varied by parity with stronger association among multiparous (AOR: 2.57; 95% CI, 2.04–3.24) compared with primiparous mothers (AOR: 1.52; 95% CI, 1.03–2.25).

Conclusion: Caesarean delivery significantly increased the likelihood of delayed breastfeeding initiation and increased prelacteal feeding practices. Breastfeeding support and guidance should target women considering caesarean delivery.

Keywords: feeding practices, breastfeeding initiation, caesarean delivery, Egyptian women

Introduction

During the early years of life nutrition is fundamental for child health and development (1). Scaling up breastfeeding to near universal level (90–95%) might prevent approximately 823 000 deaths in low and middle-income countries (LMICs) (2). Suboptimal breastfeeding substantially contributes to under-5 mortality due to neonatal infections (45%), diarrhoea (30%) or acute respiratory infections (30%) (3). Beyond survival, breastfeeding boosts brain development in children and protects against overweight and obesity. Mothers also reap significant health benefits from breastfeeding, including decreased risk of breast cancer, ovarian cancer and type 2 diabetes (4). Additionally, it aids in birth spacing (5). The World Health Organization (WHO) recommend breastfeeding initiation within an hour of birth, exclusive breastfeeding for the first 6 months of life and breastfeeding continuation thereafter (3).

It is recognized that LMICs are disproportionately affected by suboptimal breastfeeding practices (6): only 37% of infants aged < 6 months are exclusively breastfed and only 50% of mothers initiate breastfeeding within

one hour of delivery (2). In Egypt, only 29% of 4–5-month-old infants were exclusively breastfed, 56% of infants were put to breast within one hour of birth and 47% were given something other than human milk during the first 3 days after birth (7).

Timely breastfeeding initiation stimulates oxytocin production which enhances uterine contractions and reduces post-partum haemorrhage. The release of colostrum, the first human milk, which contains nutritious and immunity factors, is facilitated by early breast suckling (8). Delayed breastfeeding initiation raises the possibility of neonatal mortality and is more likely related to provision of prelacteal feeds and the withholding of colostrum (9).

The provision of prelacteal feeds, a key contributor to suboptimal breastfeeding, is also prevalent in many LMICs (9). Practising prelacteal feeding implies that an infant is not exclusively breastfed. Prelacteal feeding affects stimulation of human milk production, infant's suckling, and maternal–infant bonding. It exposes the infant to the risk of infection, especially it is introduced before the infant has received colostrum (10).

Evidence has shown a variety of factors that influence breastfeeding practices in early infant life (*11,12*). Of particular concern is the possible influence of caesarean section on the initiation of breastfeeding and provision of prelacteal feeds (*13,14*). Further exploration of this complicated relationship is crucial due to the increasing prevalence of caesarean deliveries in LMICs, with a 6.7% increase from 1990 to 2014 (*15*). In Egypt, rates of caesarean delivery increased from 10.3% in 2000 to 27.6% in 2008 (*7*) and 51.8% in 2014 (*16*).

The influence of caesarean delivery on infant feeding practices has not been examined in Egypt. Improved understanding of such a relationship could help to develop interventions for promoting optimal breastfeeding. Therefore, the aim of the current study was to explore the relationship between mode of delivery and infant feeding indicators among nationally representative women of reproductive age in Egypt. We hypothesized that the mothers who had caesarean delivery would be more likely to delay breastfeeding initiation and would be more likely to practise prelacteal feeding.

Methods

Study design

The present study is based on a secondary analysis of data from the 2014 Egypt Demographic and Health Survey. A detailed description of the sampling techniques and other related methodology for the 2014 survey is available elsewhere (*16*).

In brief, the survey was designed to provide up-to-date demographic and health indicators with special emphasis on maternal and child health. A probability-based, stratified, multi-stage cluster sampling technique was used to select participants that were representative of the Egyptian population. Data were collected with approval from the Ministry of Health and Population (MoHP) (*16*). Informed consent was obtained from all the respondents before their participation in the survey. Out of the 21 903 eligible women, 21 762 were successfully interviewed, representing a response rate of 99.4% (*16*).

Study population and sample size

The sampling frame for the current analysis was restricted to mothers with last-born, ever breastfed children born within 2 years preceding the 2014 Egypt Demographic and Health Survey (*n* = 6130). Mothers with missing data on mode of delivery or any of the other covariates determined in the current study were excluded (*n* = 2357), leaving a final sample of 3773 mothers.

Operational definitions and study variables

Outcome variables

The main outcomes were infant feeding indicators reflecting breastfeeding practices during early life, i.e. timing of breastfeeding initiation and introduction of prelacteal feeds. In the Egypt Demographic and Health Survey individual questionnaire, mothers were asked how long following delivery they initiated breastfeeding. Answers were recorded in hours and days (*16*). The timing of breastfeeding initiation was then classified as early initiation if breastfeeding was initiated within an hour of birth and delayed initiation if breastfeeding was initiated more than one hour following delivery. The Egypt Demographic and Health Survey defined the introduction of prelacteal feeds as giving anything other than human milk to an infant during the first 3 days after birth. (*16*). This was coded as 1 if mother provided prelacteal feeds, and 0 otherwise.

Exposure variable

Mode of delivery of the index child was the exposure of interest in the current study, whether delivery was caesarean section or vaginal.

Covariates

Several confounding variables were involved in the current analysis depending on prior studies (*11,12*) such as mother's age at time of birth, mother's education, mother's occupation (no, yes), residence, number of household members, wealth index and parity. Sex of the child, birth weight and birth status were also considered. Maternal health service-related factors were also included such as the number of antenatal care (ANC) visits, place of delivery and attendance of a skilled provider at delivery.

The mother's age at birth was obtained by subtracting date of birth of the child from the mother's birth date. The wealth index was used to estimate the cumulative living standard of households. It was precalculated in the Egypt Demographic and Health Survey based on having of specific assets such as TVs and bicycles, construction materials, water sources, and sanitation. Each household was then classified into 1 of 5 groups; ranging from first quantile (poorest) to fifth quintile (richest) (*16*). In the current study, mothers were categorized as poor if they belonged to the first or second quintile, middle if they belonged to the third quantile, and rich if they belonged to the fourth and fifth quintiles.

Children weighing < 2500 g at birth were classified as low birth weight, those > 4200 g were categorized as macrosomia, otherwise they were considered normal birth weight. A mother was considered to have had regular ANC visits if she attended at least 4 visits throughout pregnancy (*17*). A skilled provider at delivery was determined when the delivery was facilitated by a doctor or trained nurse/midwife (*16*).

Statistical analysis

Frequencies and proportions were used to describe the characteristics of the study participants. The Rao-Scott chi-square test was performed to analyse the study participants according to their breastfeeding practices. Two fully adjusted logistic regression models were created to assess the association between mode of delivery and infant feeding indicators. Pairwise interactions between mode of delivery and each covariate were performed to explore if a third variable influenced the association between mode of delivery and infant feeding indicators.

A multivariable adjusted logistic regression model was then created to examine the association between mode of delivery and timing of breastfeeding initiation. All the confounding variables were entered simultaneously into all regression models.

A complex sample design analysis that took into consideration the cluster sampling design, sample weight and strata was performed to provide generalizable and accurate estimates for the population parameters. Thus, weighted percentages were presented. The potential presence of multicollinearity was examined and ruled out using a variance inflation factor. Statistical tests were performed using *SAS*, University Edition. Two-tailed *P*-value < 0.05 was considered statistically significant.

Ethical considerations

The dataset was downloaded after the purpose of the study was justified and approved by the Demographic and Health Survey. The current study was deemed exempt from a full review because it was based on the anonymous public use of a secondary dataset with no identifiable information on the survey participants.

Results

Out of the 3773 participating mothers, 74.9% initiated breastfeeding more than 1 hour after birth and 63.5% practised prelacteal feeding within 3 days after birth (Table 1). A high proportion of mothers at the time of birth were aged 25–34 years (84%) and nearly two-thirds were rural residents (66%). The majority of mothers (89%) had at least 4 ANC visits during their last pregnancy, majority of births (93.2%) took place in health facilities and approximately two-thirds of deliveries were via caesarean section (64.3%).

Breastfeeding initiation more than one hour following delivery was statistically significantly associated with urban residence, rich wealth index, multiparity, ≥ 4 ANC visits, caesarean delivery, delivery at a a health facility, exposure to a skilled provider at delivery and prelacteal feeds (Table 1). The introduction of prelacteal feeds was statistically significantly more frequent among mothers with poor wealth index, multiparity, low birth weight child, multiple births, ≥ 4ANC visits, caesarean delivery and delayed initiation of breastfeeding (Table 1).

Mothers who had a caesarean section were significantly more likely to delay breastfeeding initiation and introduce prelacteal feeds to their children by 2.25 [95% confidence interval (CI): 1.84–2.74] and 1.44 (95% CI: 1.19–1.74) times, respectively (Table 2). Additionally, we found a significant interaction between parity and mode of delivery on the timing of breastfeeding initiation (*P* for interaction = 0.0156). Table 3 displays the results of the analysis examining the association between caesarean delivery and delayed breastfeeding initiation stratified by parity. Caesarean delivery was statistically significantly associated with greater odds of delayed breastfeeding initiation. However, the strength of the association was more pronounced among the multiparous mothers

[adjusted odds ratio (AOL) 2.57; 95% CI: 2.04–3.24) when compared with the primiparous mothers (AOR 1.52; 95% CI: 1.03–2.25).

Discussion

The current study showed that infant feeding indicators in Egypt were at a suboptimal level. It was reported that nearly three-quarters of mothers started to breastfeed more than 1 hour after their most recent delivery, giving a rate of "poor" according to the WHO infant feeding indicators (*18*). Globally, rates of delayed breastfeeding initiation vary between 82.3% in Peru, 40.1% in China, 21.7% in Nigeria and 1.6% in Angola (*19*). In the WHO Eastern Mediterranean Region, delayed breastfeeding initiation varies from 81.4% in Jordan, 57.2% in Iraq, 31.3 % in the Islamic Republic of Iran and 28.7% in Oman (*4*). Our finding could be explained by the fact that the women in the study tended to be from wealthier families, were more educated and used private facilities, which might not adequately promote proper breastfeeding practices (*20*).

The majority of births in the current study took place in health facilities which were associated with delayed initiation of breastfeeding. Delayed breastfeeding initiation is probably attributed to health facility practices. It could be related to heavy workload and shortage of health providers necessary to provide supportive care and enhance timely breastfeeding initiation (*19*).

About two-thirds of mothers introduced prelacteal feeds within 3 days of delivery, which was similar to the findings reported in the Dominican Republic (55%) (*21*) and Côte d'Ivoire (67%) (*1*), but higher than reported in Sudan (53 %) (*22*), the Islamic Republic of Iran (40.8%) (*23*), Nepal (26.5%) (*24*) and Ethiopia (25.29%) (*25*), and lower than the findings from Kuwait (81.8%) (*26*). The rate of prelacteal feeding varies among countries due to different cultures, beliefs, and available feed. Prelacteal feeding is given because mothers believe it cleans the meconium from the intestines or has laxative and rehydration effects for infants (*27*).

The estimated prevalence of caesarean delivery in the analytic sample for the current study (64.3%) and the national prevalence rate (51.8%) are quite alarming (*16*). The difference between the prevalence in the current analysis and the national prevalence might be due to different sampling frames. According to WHO, the ideal population-based rate for caesarean deliveries varies between 10% and 15% (*28*). The reasons for the high prevalence of caesarean delivery among Egyptian women are multifactorial. Various factors might be attributed to this trend such as changes in mothers' characteristics, socioeconomic and cultural factors and the rise medical malpractice (*15*). Recent Egyptian studies suggested that the high prevalence of caesarean delivery is possibly related to the shift towards delivery at private health facilities (*29,30*). It has also been reported that women might be pushed to have caesarean deliveries by their desire to better control their time, fear of pain, misconceptions about the risks of vaginal delivery, and

Table 1 Characteristics of the study participants (mothers in Egypt) (n = 3773) according to early feeding indicators

Characteristic	Initiation of breastfeeding		Prelacteal feed	
	Early (n = 976, 25.1%)[a]	Delayed (n = 2797, 74.9%)[a]	No (n = 1381, 36.5%)[a]	Yes (n = 2392, 63.5%)[a]
	No. (%)	No. (%)	No. (%)	No. (%)
Mother's age at birth (years)				
15–24	77 (24.8)	208 (75.2)	111 (36.1)	174 (63.9)
25–34	820 (25.7)	2349 (74.3)	1137 (36.1)	2032 (63.9)
35–49	79 (19.8)	240 (80.2)	133 (41.8)	186 (58.2)
P-value	0.1429		0.2648	
Mother's education				
No education	122 (26.9)	293 (73.1)	167 (39.8)	248 (60.2)
Primary	71 (26.7)	185 (73.3)	104 (39.4)	152 (60.6)
Secondary or higher	783 (24.7)	2319 (75.3)	1110 (35.8)	1992 (64.2)
P-value	0.6429		0.2700	
Mother's occupation				
No	837 (24.4)	2452 (75.6)	1197 (36.4)	2092 (63.6)
Yes	139 (29.6)	345 (70.4)	184 (37.5)	300 (62.5)
P-value	0.0359		0.6965	
Residence				
Urban	397 (21.8)	1280 (78.2)	622 (37.5)	1055 (62.5)
Rural	579 (26.8)	1517 (73.2)	759 (36.1)	1337 (63.9)
P-value	0.0066		0.5490	
No. of household member				
1–4	450 (24.0)	1455 (76.0)	657 (35.0)	1248 (65.0)
5–6	332 (25.3)	939 (74.7)	488 (39.3)	783 (60.7)
≥ 7	194 (28.9)	403 (71.1)	236 (35.6)	316(64.4)
P-value	0.1601		0.1132	
Wealth index				
Poor	306 (25.9)	768 (74.1)	351 (31.4)	723 (68.6)
Middle	237 (29.6)	560 (70.4)	310 (38.5)	487 (61.5)
Rich	433 (22.1)	1469 (77.9)	720 (38.8)	1182 (61.2)
P-value	0.0045		0.0042	
Parity				
Primiparous	272 (21.6)	938 (78.4)	376 (32.1)	834 (67.9)
Multiparous	704 (26.8)	1859 (73.2)	1005 (38.6)	1558 (61.4)
P-value	0.0016		0.0014	
Sex of child				
Male	509 (25.7)	1485 (74.3)	741 (37.3)	1253 (62.7)
Female	467 (24.4)	1312 (75.6)	640 (35.7)	1139 (64.3)
P-value	0.3998		0.3825	
Birth weight				
Low	120 (23.4)	395 (76.6)	159 (31.1)	356 (68.9)
Normal	839 (25.3)	2347 (74.7)	1197 (37.5)	1989 (62.5)
Macrosomia	17 (30.1)	55 (69.9)	25 (34.5)	47 (65.5)
P-value	0.5395		0.0450	
Birth status				
Single birth	965 (25.2)	2747 (74.8)	1370 (36.8)	2342 (63.2)
Multiple birth	11 (20.0)	50 (80.0)	11 (19.7)	50 (80.3)
P-value	0.4485		0.0140	

Table 1 Characteristics of the study participants (mothers in Egypt) (n = 3773) according to early feeding indicators *(concluded)*

Characteristic	Initiation of breastfeeding		Prelacteal feed	
	Early (n = 976, 25.1%)[a]	Delayed (n = 2797, 74.9%)[a]	No (n = 1381, 36.5%)[a]	Yes (n = 2392, 63.5%)[a]
	No. (%)	No. (%)	No. (%)	No. (%)
Antenatal care visits				
None	86 (44.5)	107 (55.5)	100 (53.1)	93 (46.9)
1–3	62 (27.5)	155 (72.5)	79 (35.7)	138 (64.3)
≥ 4	828 (23.8)	2535 (76.2)	1202 (35.6)	2161 (64.4)
P-value	< 0.0001		0.0002	
Mode of delivery				
Vaginal	557 (38.3)	807 (61.7)	608 (44.5)	756 (55.5)
Caesarean section	419 (17.8)	1990 (82.2)	773 (32.1)	1636 (67.9)
P-value	< 0001		< 0.0001	
Place of delivery				
Public health facility	275 (26.4)	689 (73.6)	397 (39.8)	567 (60.2)
Private health facility	596 (22.4)	1992 (77.6)	894 (35.1)	1694 (64.9)
Home	105 (49.0)	116 (51.0)	90 (40.3)	131 (59.7)
P-value	< 0.0001		0.0643	
Exposure to skilled provider at delivery[b]				
No	66 (50.6)	62 (49.4)	53 (40.0)	75 (60.0)
Yes	910 (24.1)	2735 (75.9)	1328 (36.4)	2317 (63.6)
P-value	< 0.0001		0.4313	
Prelacteal feed				
No	530 (40.2)	851 (59.8)	–	–
Yes	446 (16.4)	1946 (83.6)	–	–
P-value	< 0.0001			
Initiation of breastfeeding				
Early (within 1 hour of birth)	–	–	530 (58.6)	446 (41.4)
Delayed	–	–	851 (29.2)	1946 (70.8)
P-value			< 0.0001	

[a]*Weighted percentage.*
[b]*Skilled provider includes doctor and trained nurse/midwife.*

to ensure the sexual satisfaction of their husbands. It could also be attributed to health system-related factors such as lack of standardized protocols and inadequate supervision, combined with provider-specific factors including the profitability incentive, convenience factor, and fear of medical litigation (*30*).

The present study reports that caesarean section substantially increased the odds of delayed breastfeeding initiation and increased the odds of provision of prelacteal feeds. Our findings are consistent with existing research that has shown a lower likelihood of breastfeeding within 1 hour after birth (*13,14,19*) and a higher likelihood

Table 2 Association between mode of delivery and early feeding indicators among mothers in Egypt (n = 3773)

Mode of delivery	Early feeding indicator			
	Delayed initiation of breastfeeding		Received prelacteal feed	
	AOR	95% CI	AOR	95% CI
Vaginal	1.00	–	1.00	–
Caesarean section	2.25*	1.84–2.74	1.44*	1.19–1.74

Models for initiation of breastfeeding were adjusted for maternal age, education, occupation, residence, number of household members, wealth index, parity, child gender, birth weight, birth status, antenatal care visits, mode of delivery, place of delivery, assistance at delivery and prelacteal feeding.
Models for prelacteal feed were adjusted for maternal age, education, occupation, residence, number of household members, wealth index, parity, child gender, birth weight, birth status, antenatal care visits, mode of delivery, place of delivery, assistance at delivery and initiation of breastfeeding.
AOR = adjusted odds ratio; CI = confidence interval.
*P < 0.05.

Table 3 Association between mode of delivery and initiation of breastfeeding according to parity among mothers in Egypt (n = 3773)

Mode of delivery	Parity			
	Primiparous		**Multiparous**	
	AOR	95% CI	AOR	95% CI
Vaginal	1.00	–	1.00	–
Caesarean section	1.52*	1.03–2.25	2.57*	2.04–3.24

Models for initiation of breastfeeding were adjusted for maternal age, education, occupation, residence, number of household members, wealth index, parity, child gender, birth weight, birth status, antenatal care visits, mode of delivery, place of delivery, assistance at delivery and prelacteal feeding.
AOR = adjusted odds ratio; CI = confidence interval.
$^*P < 0.05$.

of prelacteal feeding among women with caesarean delivery (1,11,13,21).

Various factors have been linked with decreased breastfeeding initiation or exclusivity among women with caesarean deliveries. These include mother–neonate separation immediately after birth and post-operational pain (13). Neonates delivered by caesarean section were less likely to have skin-to-skin contact directly post-delivery and were more likely not to initiate breastfeeding within a day of birth (31). Initiation, maintenance and duration of breastfeeding are enhanced by skin-to-skin contact (32). Additionally, hormones that stimulate lactogenesis could be interrupted by caesarean section due to mothers' stress or lower oxytocin production and could impede milk secretion (33). Another study also reported an association between mothers' preference for caesarean section and the choice not to breastfeed (34).

The present study revealed that the relationship between caesarean delivery and delayed breastfeeding initiation was moderated by parit,y with stronger odds among multiparous mothers compared with first-time mothers. Some studies have reported that multiparous mothers were less likely to breastfeed when compared to primiparas (35,36), consistent with our results. On the other hand, other studies have found multiparity to be significantly associated with longer exclusive breastfeeding (37,38). Multiparous mothers may have previous negative breastfeeding experiences and decided not to breastfeed. Mothers' future decisions regarding breastfeeding are affected by their previous breastfeeding experiences (39,40). Future studies should utilize survival analysis techniques to analyse more accurately the relationship between mode of delivery and timing of breastfeeding initiation after adjusting for potential confounders.

The strengths of our study included the large sample size, which provided adequate statistical power. Data were collected by authorized and credible entities using a well-tested methodology (16). The dataset also contained several potential confounding factors for breastfeeding practices that were used for adjustment in the current analysis. On the other hand, inaccurate answers from respondents due to the time interval between delivery and the survey may have contributed to potential recall bias. The exclusion of 38% of eligible participants due to missing data may have introduced selection bias. Additionally, data on the type of caesarean delivery (elective or emergency), intention to breastfeed and women's prior experiences with breastfeeding were not captured in the Egypt Demographic and Health Survey 2014.

Conclusion

Considering the suboptimal breastfeeding practices and the increasing rates of caesarean delivery in Egypt, anticipatory guidance and supportive care regarding breastfeeding should target women considering caesarean delivery. Furthermore, interventions to raise awareness among women and health providers regarding the potential negative consequences of caesarean delivery are also urgently needed. Support should also be tailored for pregnant multiparous women, especially for those with a history of unsuccessful breastfeeding. Further research is needed to determine the effect of the rising prevalence of caesarean deliveries on other maternal and child health outcomes.

Association entre le mode d'accouchement et les pratiques d'allaitement au sein en Égypte : analyse de l'enquête démographique et sanitaire égyptienne

Résumé

Contexte : L'augmentation du nombre des césariennes constitue une préoccupation de santé publique majeure dans les pays à revenu faible et intermédiaire. Les données sur l'influence des césariennes sur les pratiques d'allaitement au sein dans ces pays font actuellement défaut.

Objectifs : Étudier l'association entre le mode d'accouchement et la mise en route de l'allaitement au sein et les pratiques d'alimentation prélactée dans un échantillon de femmes égyptiennes représentatif au niveau national.

Méthodes : Une étude transversale a été réalisée auprès de 3773 femmes dans le cadre de l'enquête démographique et sanitaire égyptienne de 2014. Les résultats d'intérêt étaient le moment de la mise en route de l'allaitement au sein et les pratiques d'alimentation prélactée. Des statistiques descriptives et des modèles de régression logistique multivariable ont été appliqués.

Résultats : Au total, 25,1 % des mères ont commencé à allaiter dans l'heure suivant l'accouchement et 63,5 % ont pratiqué l'alimentation prélactée dans les trois jours suivant l'accouchement. Les mères qui ont accouché par césarienne étaient plus susceptibles de retarder le début de l'allaitement au sein [odds ratio ajusté (ORa) : 2,25 ; intervalle de confiance (IC) à 95 % : 1,84-2,74] et de s'engager dans l'alimentation prélactée (ORa : 1,44 ; IC à 95 % : 1,19-1,74). En outre, la relation entre l'accouchement par césarienne et la mise en route tardive de l'allaitement au sein varie selon le nombre d'enfants, avec une association plus forte chez les multipares (ORa : 2,57 ; IC à 95 % : 2,04-3,24) par rapport aux mères primipares (ORa : 1,52 ; IC à 95 % : 1,03-2,25).

Conclusions : L'accouchement par césarienne a considérablement augmenté la probabilité de retarder le début de l'allaitement au sein et les pratiques d'alimentation prélactée. L'appui et l'orientation en matière d'allaitement au sein devraient cibler les femmes qui envisagent l'accouchement par césarienne.

الارتباط بين طريقة الولادة وممارسات الرضاعة الطبيعية في مصر : تحليل ثانوي للمسح السكاني والصحي لمصر

نهى فاضل، زيلاليم هالي

الخلاصة

الخلفية: تُشكل زيادة عدد عمليات الولادة القيصرية مصدرًا رئيسيًا للقلق في مجال الصحة العامة في البلدان المنخفضة والمتوسطة الدخل. ولا تتوافر حاليًا براهين حول تأثير الولادة القيصرية على ممارسات الرضاعة الطبيعية في هذه البلدان.

الأهداف: هدفت هذه الدراسة إلى دراسة الارتباط بين طريقة الولادة وبدء الرضاعة الطبيعية وممارسات التغذية السابقة للدَرّ (ظهور الأسنان اللبنية) في عينة تمثيلية وطنية من النساء المصريات.

طرق البحث: أُجريت دراسة مقطعية شملت 3773 امرأة من المسح السكاني والصحي لمصر. وتمثلت النتائج محل الاهتمام في توقيت بدء الرضاعة الطبيعية وممارسات التغذية السابقة للدَرّ. وقد أُجريت إحصاءات وصفية ونماذج انحدار لوجستي متعدد المتغيرات.

النتائج: بوجه عام، بلغت نسبة الأمهات اللاتي بدأن الرضاعة الطبيعية خلال ساعة من الولادة 25.1٪، بينما بلغت نسبة الأمهات اللاتي مارسن التغذية السابقة للدَرّ خلال 3 أيام من الولادة 63.5٪. وكانت نسبة الأرجحية لتأخر بدء الرضاعة الطبيعية أعلى بين الأمهات اللاتي ولدن ولادة قيصرية [نسبة الأرجحية المُصحّحة 2.25؛ بفاصل ثقة 95٪: 1.84–2.74]، وازدادت احتمالية قيامهن بالتغذية السابقة للدَرّ (نسبة الأرجحية المُصحّحة: 1.44؛ بفاصل ثقة 95٪، 1.19–1.74). وعلاوة على ذلك، تباينت العلاقة بين الولادة القيصرية وتأخر بدء الرضاعة الطبيعية من حيث التكافؤ مع وجود ارتباط أقوى بين الولادات المتعددة (نسبة الأرجحية المُصحّحة: 2.57؛ بفاصل ثقة 95٪، 2.04–3.24) مقارنة بالأمهات اللاتي ولدن مرة واحدة فقط (نسبة الأرجحية المُصحّحة: 1.52؛ بفاصل ثقة 95٪، 1.03–2.25).

الاستنتاجات: أدت الولادة القيصرية إلى زيادة احتمال تأخر بدء الرضاعة الطبيعية وممارسات التغذية السابقة للدَرّ زيادةً كبيرة. وينبغي أن يستهدف الدعم والتوجيه المتعلقان بالرضاعة الطبيعية النساء اللاتي يفكرن في الولادة القيصرية.

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Association of bullying behaviour with smoking, alcohol use and drug use among school students in Erbil City, Iraq

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Abstract

Background: Substance use and bullying are prevalent among adolescents and have a wide range of adverse outcomes. The association of bullying with substance use has not been examined in Kurdistan and Iraq, which have suffered from the effects of long-term conflict and economic hardship.

Aims: To examine the association between each form of bullying among adolescents and substance use.

Methods: This cross-sectional study was conducted in a sample of public schools in Erbil City, Iraq in 2017. The study involved 1070 adolescents selected from 35 schools using a multistage cluster sampling method. A self-reported close-ended questionnaire was used for data collection. Male and female students attending grades 7–12 and aged 13–18 years were included.

Results: The overall prevalence of bullying behaviour was 60.0%; 30.8% were victims, 26.2% were bully-victims, and 3.0% were bullies. There was a significant association between different forms and categories of bullying and substance use. The strongest association was with the students involved in sexual bullying, followed by racial and cyber bullying. The strongest association between bullying and substance use was found in the bully-victim category, followed by victims and bullies.

Conclusions: Substance use and bullying behaviour seem to be widespread problems among adolescents in Erbil schools. Substance use is significantly associated with different categories of bullying behaviour. There is a need for effective school-based preventive interventions to tackle these problems. Future research needs to examine the likely direction of the association between bullying and substance use.

Keywords: school bullying, school violence, adolescent bullying, victimization, substance use.

Introduction

Bullying is a frequent and recognized problem for children and adolescents (*1*). Children and adolescents are often surveyed in schools where they spend most of their time, and they are easily accessible (*2*). The prevalence of bullying varies significantly among countries as well as among sex and age groups. The global prevalence of bullying among children and adolescents varies from 8% to 32% (*3*). Bullying is not just a social problem but also a health problem (*4,5*). There is strong evidence for a causal association between bullying victimization and health problems, including anxiety, depression, poor health, different forms of substance use and their consequences, and suicidal ideation and behaviours (*6*).

Smoking, alcohol use, and the use of other substances is a worldwide problem that affects many children and adolescents (*7*). Research has independently established the high occurrence of bullying and substance use and their harmful consequences among adolescents (*8,9*). Research assessing the association between bullying and substance use in adolescents has suggested some

inconsistencies and identified variables affecting the inconsistencies (*6,8–12*). Most of the research in this field indicates that there is a link between bullying and substance use (*8,9,13*). Most of the previous studies that have assessed the relationship between bullying and substance use have been cross-sectional studies. One clear research gap is the directionality of the association (*9*). Research assessing the temporal association between the 2 events has suggested bidirectional and causal paths related to the existence of an interactive process (*6,11*).

Minimal research exists about bullying and its association with substance use in Iraq and the Kurdistan Region. In a study from Baghdad, around 39% of secondary school students reported bullying victimization, and 21.5% reported sexual victimization. Bullying and victimization were significantly associated with substance use and failure in school (*14*). Iraq, and the Kurdistan Region, in particular, have experienced structural violence and long years of conflict that might have affected people's behaviour. The region has witnessed issues related to population displacement, economic hardship, widening of the economic gap, and a rapid rise in the use of

poorly controlled technology and social media. This type of environment can trickle down into schools and behaviours of individuals and might affect violence and substance use. Even if consistent evidence has suggested the presence of an association between bullying and substance use elsewhere, the contextual differences suggest the importance of exploring this association, specifically in the Kurdistan Region. Therefore, this study aimed to examine the association between each form of bullying among adolescents and substance use (smoking, alcohol use and drug use) in a representative sample of school adolescents in Erbil City.

Methods

Setting

This cross-sectional study was conducted in secondary schools in Erbil City in the Kurdistan Region of Iraq. There were 214 public secondary schools in Erbil in 2017, with a total of 84 378 students in grades 7–12.

Participants

This study involved students of both sexes aged 13–18 years in grades 7–12 attending public schools across Erbil. The students were recruited by a 3-stage cluster-sampling technique. The schools in Erbil were divided into 6 groups according to the city municipalities. From each municipality, schools were selected using a random number table. The number of schools selected from each municipality was proportional to the number of students within that municipality. A total of 35 schools were selected. The sample size was calculated using a population size of 84 378 students in grades 7–12, a 95% confidence interval, 5% allowed error, a prevalence rate of bullying of 39.1% as reported previously (14), and a design effect of 3. The calculated sample size was 1092. The sample was increased to 1350 to account for nonresponse, recording errors, and parenteral refusal of consent. From each selected school, a single class was selected randomly, and all students in that class were included in the study.

Measures

A closed-ended questionnaire was specifically designed based on literature review and expert opinion. We used the standard questions from 3 other studies that had assessed the association of bullying with substance among adolescents in different settings in Italy and the United States of America (USA) (9,13,15). The questionnaire included 5 parts. (1) Demographic characteristics of the participants. (2) Socioeconomic characteristics. The data from this part were used to determine the socioeconomic status of each student using a reliable and validated method for the Iraqi context designed by Omer and A-Hadithi (16). (3) Students' smoking, alcohol use, and use of tramadol, trihexyphenidyl or carisoprodol. These specific drugs were included in the questionnaire, as research has shown that the diverted or illicit drugs are the leading drug problem in Iraq (17,18). The questions about substance use were dichotomized (Yes/No). Smoking on

a daily basis, ever drinking alcohol, and ever using any illegal drugs were considered Yes answers. (4) Students being victims of bullying. (5) Students being bullies. In-school bullying was classified into 6 primary forms of physical, verbal, relational, cyber, racial and sexual (13). Students were categorized into 4 groups of bullies, victims, bully-victims and uninvolved (19). The questionnaire was translated to the local Kurdish language and Arabic to ensure all students correctly understood it. The translation was verified by a native Kurdish speaker and a native Arabic speaker fluent in English through back-translation to English. The validity and applicability of the questionnaire were tested by a pilot study, which showed an internal consistency (Cronbach's) estimation of 0.77 for the Kurdish version and 0.75 for the Arabic version. The reliability coefficient was 0.80 for the Kurdish version and 0.77 for the Arabic version.

Procedure

The counselling specialist at the school attended the data collection in each class. The researcher explained the nature of the research, and a definition of bullying was given to the students. Written informed consent was distributed to the students to be signed by their parents or other household guardians and returned the day after. On the next day, students were asked to complete the closed-ended questionnaire after obtaining their assent. The questionnaires were anonymously completed to ensure confidentiality and to obtain honest answers. Data collection was conducted from January to March 2017. The Research Ethics Committee at Hawler Medical University approved the research protocol. Institutional approval to access the schools was obtained from Erbil Directorate of Education.

Analysis plan

SPSS version 19 was used for data entry and analysis. The χ^2 test of association was used to compare proportions, and Fisher's exact test was used if the expected count of > 20% of the cells was < 5. $P \leq 0.05$ was regarded as statistically significant. Univariate logistic regression analysis was used to assess the association of substance use (any of daily smoking, ever drinking alcohol, or ever using drugs) with the different forms and categories of bullying behaviour. Odds ratios (ORs) were calculated. The uninvolved group was set as the reference group for calculating ORs. Multiple logistic regression was also used to control for the sociodemographic factors of age, sex, socioeconomic status, and ethnicity of the students. The binary outcome for logisitic regression included any of smoking, alcohol use or drug use (Yes/No).

Results

Demographic characteristics

Of the 1350 students from the 35 schools invited to participate in the study, 1150 completed the questionnaire, with a response rate of 85.2%. Of the 200 refusals, 144 (72%) were due to parental lack of consent. Eighty (6.95%)

questionnaire forms were discarded because of improper filling, making the sample 1070 students and reducing the response rate to 79.3%. The mean (standard deviation) age was 15.56 (1.41) years, and there were 554 (51.8%) male and 516 (48.2%) female students, with a female to male ratio of 0.9:1 (Table 1). Students aged 15–16 years comprised the highest proportion of the participants (518; 48.4%). All students were Muslims, and most of them were Kurds (988; 92.3%). Most of the students were from the middle socioeconomic class (581; 54.3%).

Prevalence of substance use in relation to form and category of bullying

Of the 1070 students, 642 were involved in general bullying behaviour with an overall prevalence of 60.0%; 330 students (30.8%) were victims, 280 students (26.2%) were bully-victims, and 32 students (3.0%) were bullies (Table 2). The prevalence of smoking and alcohol use among students involved in bullying [159 (24.8%) and 23 (3.6%), respectively] was significantly higher compared to that in students not involved [31 (7.2%) and 1 (0.2%), respectively]. All 12 drug users were involved in bullying. The highest prevalence of smoking, alcohol use and drug use were in the bully-victim category, followed by victims and bullies. The prevalence of substance use was significantly higher in students involved in bullying than in those not involved in all forms of bullying. The highest prevalence of all types of substance use was among students involved in sexual bullying, followed by racial and cyberbullying.

Association of substance use with form and category of bullying

Univariate logistic regression analysis showed that bullying behaviour categories of victim and bully-victim in general and physical bullying were significantly associated with substance use ($P < 0.001$) (Table 3). For all other forms of bullying behaviour, all categories of bullying were significantly associated with substance use. In multiple logistic regression, the strength of the association was slightly lower for all the categories. However, most of the significant associations were maintained, except for that between substance use and the bully only category in social bullying, cyberbullying, and racial bullying.

Discussion

In this study, students who were victims of bullying, bullies, and bully-victims had a significantly higher prevalence of substance use, including smoking, alcohol use and drug use. Similar results were reported in low- and middle-income countries (4), Italy (13), and the USA (5,20,21). The literature has reported a similar significant association between bullying only and smoking (22,23), and other studies have concentrated on alcohol use (20) or drug use (9,24). Although most researchers reported an increased rate of substance use among students who were involved in different categories of bullying, the details of the relationship between substance use and bullying is unclear and varies greatly throughout the literature (5).

Similar to other studies, our study revealed that the highest prevalence of the 3 types of substance use was in the bully-victim category (13,21,25,26). Other studies have reported that bully-victims had a significantly higher risk for only cigarette smoking (27), alcohol use (28), or drug abuse (9) than had victims and those not involved in bullying. The highest rate of substance use in the present study was among the bully-victims category, followed by victims and bullies. Another study reported that bullies were at a higher risk for substance abuse than were victims, making the sequence bully-victims, followed by bullies and victims (20). This finding is in contrast to the results of other studies that reported higher substance use among bullies than victims (9,21). The highest rate of substance use among the bully-victims category alone without including victims suggests some interactive or moderator/mediator effect rather than a triggering effect.

Being a bully in general, and physical bullying, were not significantly associated with substance use, which is in contrast to the results of other studies (29,30). A previous cross-sectional study maintained that smoking might be a marker to identify bullies (26). Lack of such a significant association in our study could be related to having a small number of participants in the bully-only category.

There is no clear evidence regarding victims (5), and the correlation between victimization and substance use has been inconsistent in the literature (5,12). Our results showed that being a victim was significantly associated with substance use. This agrees with other studies that have revealed that victims of bullying display a higher risk for cigarette smoking (25), alcohol use (9,13,24), drug abuse (31), or all substance use (9,21,25). However, researchers have found that victims were less likely to be engaged in cigarette smoking (28) or alcohol use (27) than students not involved in bullying. However, other

Table 1 Demographic characteristics of the study participants

Characteristics	No.	(%)
Sex		
Male	554	(51.8)
Female	516	(48.2)
Age of students, yr		
13–14	265	(24.8)
15–16	518	(48.4)
17–18	287	(26.8)
Socioeconomic status		
Low	326	(30.5)
Middle	581	(54.3)
High	163	(15.2)
Ethnicity		
Kurdish	988	(92.3)
Arabic and Turkman	82	(7.7)

Table 2 Prevalence of different types of substance use according to forms and categories of bullying

Form and category of bullying	Total		Smoking		Alcohol use		Drug use	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
General bullying								
Involved	642	(60.0)	159	(24.8)	23	(3.6)	12	(1.9)
Victim only	330	(30.8)	57	(17.3)	6	(1.8)	4	(1.2)
Bully-victim	280	(26.2)	100	(35.7)	17	(6.1)	8	(2.9)
Bully only	32	(3.0)	2	(6.3)	0	(0)	0	(0)
Not involved	428	(40.0)	31	(7.2)	1	(0.2)	0	(0)
P value			< 0.001		< 0.001		0.002*	
Physical bullying								
Involved	452	(42.2)	132	(29.2)	19	(4.2)	10	(2.2)
Victim only	225	(21.0)	48	(21.3)	4	(1.8)	2	(0.9)
Bully-victim	168	(15.7)	75	(44.6)	14	(8.3)	8	(4.8)
Bully only	59	(5.5)	9	(15.2)	1	(1.7)	0	(0.0)
Not involved	618	(57.8)	58	(9.4)	5	(0.8)	2	(0.3)
P value			< 0.001		< 0.001		0.004	
Verbal bullying								
Involved	553	(51.7)	148	(26.8)	21	(3.8)	11	(2.0)
Victim only	308	(28.8)	61	(19.8)	5	(1.6)	3	(1.0)
Bully-victim	194	(18.1)	76	(39.2)	14	(7.2)	7	(3.6)
Bully only	51	(4.8)	11	(21.6)	2	(3.9)	1	(2.0)
Not involved	517	(48.3)	42	(8.1)	3	(0.6)	1	(0.2)
P value			< 0.001		< 0.001		0.005	
Social bullying								
Involved	451	(42.1)	126	(27.9)	22	(4.9)	11	(2.4)
Victim only	264	(24.7)	52	(19.7)	8	(3.0)	3	(1.1)
Bully-victim	148	(13.8)	66	(44.6)	13	(8.8)	8	(5.4)
Bully only	39	(3.6)	8	(20.5)	1	(2.6)	0	(0.0)
Not involved	619	(57.9)	64	(10.3)	2	(0.2)	1	(0.2)
P value			< 0.001		< 0.001		< 0.001	
Cyberbullying								
Involved	332	(31.0)	110	(33.1)	21	(6.3)	10	(3.0)
Victim only	189	(17.7)	51	(27.0)	6	(3.2)	3	(1.6)
Bully-victim	101	(9.4)	49	(48.5)	12	(11.9)	6	(5.9)
Bully only	42	(3.9)	10	(23.8)	3	(7.1)	1	(2.4)
Not involved	738	(69.0)	80	(10.8)	3	(0.4)	2	(0.3)
P value			< 0.001		< 0.001		< 0.001*	
Racial								
Involved	132	(12.3)	45	(34.1)	9	(6.8)	5	(3.8)
Victim only	92	(8.6)	29	(31.5)	3	(3.3)	1	(1.1)
Bully-victim	24	(2.2)	11	(45.8)	4	(16.7)	4	(16.7)
Bully only	16	(1.5)	5	(31.3)	2	(12.5)	0	(0.0)
Not involved	938	(87.7)	145	(15.5)	15	(1.6)	7	(0.7)
P value			< 0.001		0.001*		0.010*	
Sexual								
Involved	83	(7.8	44	(53.0)	12	(14.5)	7	(8.2)
Victim only	41	(3.8)	20	(48.8)	3	(7.3)	2	(4.9)
Bully-victim	14	(1.3)	10	(71.4)	5	(35.7)	3	(21.4)
Bully only	28	(2.6)	14	(50.0)	4	(14.3)	2	(7.1)
Not involved	987	(92.2)	146	(14.8)	12	(1.2)	5	(0.5)
P value			< 0.001		< 0.001*		< 0.001*	

P values show the difference between the numbers involved and not involved.
* Fisher's exact test.

Table 3 Univariate and multiple logistic regression analyses of association of substance use with different forms and categories of bullying

Form and category of bullying	Univariate analysis			Multiple logistic regression			
	Odds Ratio	95% CI		P value	Odds Ratio	95% CI		P value
General bullying								
Not involved[a]	1				1			
Victim only	2.79	1.76	4.42	<0.001	2.43	1.51	3.92	<0.001
Bully-victim	7.68	4.96	11.91	<0.001	6.59	4.17	10.42	<0.001
Bully only	0.85	0.20	3.74	0.834	0.75	0.17	3.39	0.707
Physical bullying								
Not involved	1				1			
Victim only	2.52	1.67	3.82	<0.001	1.86	1.20	2.89	0.006
Bully-victim	8.46	5.65	12.65	<0.001	5.60	3.64	8.64	<0.001
Bully only	1.67	0.78	3.57	0.183	1.30	0.59	2.85	0.521
Verbal bullying								
Not involved	1				1			
Victim only	2.78	1.83	4.22	<0.001	2.35	1.52	3.64	<0.001
Bully-victim	7.90	5.18	12.06	<0.001	6.34	4.07	9.87	<0.001
Bully only	3.03	1.45	6.33	0.003	2.79	1.28	6.10	0.010
Social bullying								
Not involved	1				1			
Victim only	2.11	1.42	3.12	<0.001	1.98	1.31	2.99	0.001
Bully-victim	7.32	4.85	11.05	<0.001	5.75	3.73	8.87	<0.001
Bully only	2.51	1.14	5.52	0.022	2.11	0.92	4.84	0.079
Cyberbullying								
Not involved	1				1			
Victim only	3.16	2.14	4.68	<0.001	2.71	1.79	4.09	<0.001
Bully-victim	8.61	5.47	13.55	<0.001	6.73	4.16	10.90	<0.001
Bully only	2.88	1.39	5.95	0.004	2.14	0.99	4.59	0.052
Racial bullying								
Not involved	1				1			
Victim only	2.54	1.59	4.07	<0.001	2.23	1.34	3.68	0.002
Bully-victim	4.45	1.95	10.11	<0.001	2.82	1.20	6.61	0.017
Bully only	3.15	1.13	8.80	0.028	1.74	0.60	5.03	0.304
Sexual bullying								
Not involved	1				1			
Victim only	5.86	3.10	11.07	<0.001	4.51	2.27	8.94	<0.001
Bully-victim	33.48	7.42	151.10	<0.001	25.33	5.16	124.37	<0.001
Bully only	5.58	2.61	11.94	<0.001	3.87	1.74	8.61	0.001

[a]Students not involved in each specific form of bullying.

studies revealed no association at all, as being a victim did not predict substance use (29,32). Among victims, it may be that students smoke cigarettes to reduce the anxiety produced by the constant aggression, or that they use substances to improve their social image among their peers (5). Another explanation is that victimized adolescents might turn to substance use to become more accepted by their peers or as a means to become members of "the group", and ultimately, avoid victimization (13). Also, victims might turn to substance use as a coping mechanism with the strong emotional feelings that they experience, such as sadness or irritability, and dealing

with the anxiety resulting from attacks and rejection by their peers (21).

In all forms of bullying, bullies, victims and bully-victims had a significant association with smoking, alcohol use and drug use. Similarly, a previous study showed that physical, verbal and relational bullying had reciprocal relations with substance use (33). Other studies have revealed a positive association between substance use and physical bullying (34) and victimization (24). Similar findings have also been reported for relational victimization and cyberbullying and cyber victimization (24,35).

In the current study, the high prevalence of substance use, particularly smoking, and bullying behavior, in Erbil City was accompanied by significant associations between substance use and the different categories and forms of bullying behaviour. These alarming findings might be related to different contextual factors that have affected the Kurdistan Region and Iraq as a whole. The long years of conflict and structured violence, together with the unstable security situation, economic uncertainty, and social and demographic changes due to population movement and displacement might have influenced such behavioural change, particularly among vulnerable adolescent groups. Interventions directed at preventing or reducing substance use and bullying behaviour in the Region should consider the importance of these contextual factors and need to adopt socially and culturally acceptable and effective methods.

Our study provides an insight into the problems of bullying and substance use and the association between these problems in Iraq. These findings may help with designing effective preventive interventions such as school-based interventions involving classroom curricula and social skills training. Our study can be used as a case study for other countries potentially facing similar problems of bullying and substance use. When examining the association between bullying and substance use, it is essential to find out the likely direction of this association. As the current study was cross-sectional, it cannot establish causality. Several prospective studies have determined the association between bullying and substance use after a few years of follow-up (25, 31). Even though it seems that bullying victims are more prone to risky behaviour like substance use, it is not possible to determine the temporality or the causality direction of these associations. While these findings suggest that bullying behaviour may develop first, future longitudinal research is needed to truly test mediation and establish the temporal relationship between these variables. The current study also relied exclusively on self-reporting, which can be subjected to intentional distortion, inattention, and faulty recall. Another limitation of this study was the use of multiple assumptions for calculating the sample size; some of which were not clearly specified, such as using one reference for estimating the prevalence of bullying. We have used substance use as one variable for testing the association with bullying. However, it was mainly smoking that contributed to the weight of this variable as the sample included 190 smokers with only 24 alcohol users and 12 drug users. Therefore, the tested association of bullying is primarily with smoking rather than the use of other substances. Finally, a multinomial logistic regression model can be used by which the 4 categories of bullying are analysed at the same time.

Conclusion

Substance use, mainly smoking, and bullying behavior, seem to be widespread problems among adolescents in schools in Erbil City. Substance use among students was significantly associated with bullying behaviour. There is a need to design and implement effective school-based preventive interventions to tackle these problems. Future research needs to determine the factors associated with bullying in Iraqi Kurdistan and understand the complex inter-relations and the direction of the association between bullying and substance use. Such a complex association might be related to the triggering effect of substance use for future violence and aggression because of physiological changes. However, it could also be related to substance use as a coping mechanism against stressful life experiences, such as bullying.

Association des comportements de harcèlement avec le tabagisme, la consommation d'alcool et de drogues dans un échantillon d'élèves de la ville d'Erbil (Iraq)

Résumé

Contexte : L'utilisation de substances psychoactives et le harcèlement sont prévalents chez les adolescents et ont un large éventail d'effets néfastes. Le lien entre le harcèlement et l'utilisation de substances psychoactives n'a pas été examiné au Kurdistan et en Iraq, qui ont souffert des effets d'un conflit à long terme et de difficultés économiques.

Objectifs : Examiner le lien entre chaque forme de harcèlement chez les adolescents et l'utilisation de substances psychoactives.

Méthodes : La présente étude transversale a été menée dans un échantillon d'écoles publiques de la ville d'Erbil (Iraq) en 2017. L'étude a porté sur 1070 adolescents sélectionnés dans 35 écoles selon une méthode d'échantillonnage en grappes à plusieurs degrés. Un questionnaire auto-administré comprenant des questions fermées a été utilisé pour la collecte des données. Des élèves de sexe masculin et féminin du secondaire âgés de 13 à 18 ans ont été inclus.

Résultats : La prévalence globale du harcèlement était de 60,0 % ; 30,8 % étaient des victimes de harcèlement, 26,2 % étaient à la fois auteurs et victimes de harcèlement et 3,0 % étaient des harceleurs. Il existe une association significative entre différentes formes et catégories de harcèlement et d'utilisation de substances psychoactives. L'association la plus forte concerne les élèves impliqués dans le harcèlement sexuel, suivi du harcèlement racial et du cyberharcèlement. La plus forte association entre le harcèlement et l'utilisation de substances psychoactives a été trouvée dans la catégorie des personnes qui sont à la fois auteurs et victimes de harcèlement, suivie par les victimes de harcèlement et les harceleurs.

Conclusions : L'utilisation de substances psychoactives et le comportement d'intimidation semblent être des problèmes répandus parmi les adolescents des écoles d'Erbil. L'utilisation de substances psychoactives est fortement associée à différentes catégories de comportement d'intimidation. Il faut mettre en place des interventions préventives efficaces en milieu scolaire pour s'attaquer à ces problèmes. La recherche future devra examiner l'orientation probable du lien entre l'intimidation et l'utilisation de substances psychoactives.

الارتباط بين سلوكيات التنمر والتدخين وتعاطي الكحول والمخدرات ضمن طلاب المدارس في مدينة أربيل، العراق

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الخلاصة

الخلفية: تسود سلوكيات تعاطي المواد والتنمر بين المراهقين وتترتب عليها نتائج سلبية واسعة النطاق. ولم يُبحث الارتباط بين التنمر وتعاطي المواد في كردستان والعراق، اللذين عانا من الآثار المترتبة على الصراع الطويل الأمد والصعوبات الاقتصادية.

الأهداف: هدفت هذه الدراسة إلى دراسة الارتباط بين كل من أشكال التنمر في صفوف المراهقين وتعاطي المواد.

طرق البحث: أُجريت هذه الدراسة المقطعية في عام 2017 على عينة من المدارس العامة في مدينة أربيل، العراق. وشملت الدراسة 1070 مراهقًا اختيروا من 35 مدرسة باستخدام طريقة أخذ العينات المتعددة المراحل. واستُخدم استبيان قائم على الإبلاغ الذاتي وذو أسئلة مغلقة لأغراض جمع البيانات. وشمل الاستبيان طلابًا من الذكور والإناث في الصفوف 7–12 وتتراوح أعمارهم بين 13–18 عامًا.

النتائج: بلغت النسبة الكلية لانتشار سلوك التنمر 60.6٪؛ 30.8٪ منهم كانوا من الضحايا، و26.2٪ من المتنمرين–الضحايا، و3.0٪ من المتنمرين. وكان هناك ارتباط قوي بين مختلف أشكال وفئات التنمر وتعاطي المواد. وكان الارتباط الأقوى في الطلاب المشاركين في التحرُّش الجنسي، يليه التنمر على أساس العرق والتحرُّش الإلكتروني. ووُجد أقوى ارتباط بين التنمر وتعاطي المواد في فئة المتنمرين–الضحايا، يليها فئتا الضحايا والمتنمرين.

الاستنتاجات: يبدو أن تعاطي المواد، خاصةً التدخين، وسلوكيات التنمر من المشكلات المنشرة انتشارًا واسعًا بين المراهقين في مدارس أربيل. ويرتبط تعاطي المواد ارتباطًا كبيرًا بفئات مختلفة من سلوكيات التنمر. وهناك حاجة إلى تدخلات وقائية مدرسية فعالة لمعالجة هذه المشاكل. وينبغي أن تدرس البحوث التي ستُجرى في المستقبل الاتجاه المحتمل للارتباط بين التنمر وتعاطي المواد.

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Khat use and perceived health problems among African migrants in Australia: an exploratory study

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Abstract

Background: The chronic use of khat, a plant with psychostimulant properties, has been associated with physical and mental health problems. Previous research found that non-khat users were more likely than khat users to perceive its use to be associated with poor health.

Aims: We aimed to identify differences in the perception of specific khat-associated health problems between khat users and non-users.

Methods: In 2012, 133 adults (≥ 18 years) from African migrant communities in 4 state capital cities in Australia completed questionnaires to ascertain their perception of whether specific health problems were associated with khat use. Multivariable log-linked Poisson regression was used to compare the perceptions of the 2 groups and identify differences, adjusting for sociodemographic factors, tobacco use and years living in Australia.

Results: Overall, 58 (44%) and 75 (56%) participants reported current khat use and no use respectively. Adjusted log-linked Poisson regression showed that people who use khat were less likely than non-users to perceive certain health and related problems were associated with khat use, including, poor health in general [prevalence risk ratio (PRR) = 0.86; 95% CI: 0.75, 1.00]; laziness (PRR = 0.86; 95% CI: 0.75, 0.99); stomach and throat problems (PRR = 0.83; 95% CI: 0.72, 0.96); and teeth, gum and mouth problems (PRR = 0.81; 95% CI: 0.67, 0.99).

Conclusions: Khat users are less likely to perceive use being associated with health problems than non-users. Providing information on the health problems associated with khat use may be an important component of health promotion strategies and interventions aimed at minimising khat-related harm.

Keywords: khat use/non-use, health perceptions, African migrant communities, Australia

Introduction

Khat (*Catha edulis*), is a plant with psychostimulant properties (*1,2*), the leaves have been traditionally chewed by people in the horn of Africa and the Arabian Peninsula. Recent migration has led to its use in other countries (*3,4*), including Australia (*5*). Data regarding khat use is not routinely collected in Australia and there is little robust evidence about the rates of use internationally, with estimates suggesting that around 20 million people use khat globally (*6,7*). Despite a lack of prevalence data in the Australian community, there are clear concerns among members of the East-African diaspora in Australia about the health and social impacts associated with khat use (*8*).

There is increasing evidence of a range of physical and mental health conditions associated with chronic khat use (*9*). These include heart disease (*10–12*), digestive system problems (*13*), hepatic disease (*14*), depression (*15*), post-traumatic stress disorder (*16*) and psychosis (*16,17*). Chronic khat use has been positively associated with both initiating and increased tobacco use (*18*), using alcohol

and other drugs (*4*) and other poor outcomes such as a decrease in quality of life and academic functioning (*19*). Recent findings also suggest a high dependence liability for khat (*5,20*), with withdrawal symptoms reported in the period after cessation (*21*). Additionally, people who use khat can develop a khat-use disorder that meets DSM-V criteria (*22*) for substance use disorder (*19*). Thus chronic khat use is a potential public health concern that warrants further investigation in order to identify options for intervention.

The traditional context of khat use has been in cultural and religious ceremonies (*23*) and in facilitating community dispute resolution (*24*). Furthermore, it is perceived as socially acceptable in migrant groups with northern African and Yemeni heritage living in the United Kingdom (*25*) and among the Somali community in Australia (*26*). Despite this, prior research has identified that people who use khat and those close to them have perceived physical and mental health problems associated with using khat, including gastrointestinal problems, sleeping problems, hallucination and anxiety

(*8,27*). Additionally, members of khat-using communities have perceived that khat use is related to negative social and family consequences, including neglect of social responsibilities, family breakdown and family violence (*8,28*).

To date, 2 studies have looked at the differences in perception of health problems associated with khat use between people who use khat and those who do not (*27,29*). An Ethiopian study has included a limited analysis of the differences in the perceived health problems associated with khat use between people who use khat and those who do not (*27*). Bivariate analysis found that participants who did not perceive a negative impact on health from khat use were 5 times more likely to use khat compared to those who perceived a negative impact on health (*27*); however, the study did not disaggregate by which specific health problems were perceived as being associated with khat use. Raising awareness and modifying the perception of specific khat-related health problems in people who use khat may be a crucial step towards intervention and prevention of harm.

In Yemen, Wedegaertner et al. investigated the differences in perception between people who did and did not use khat with respect to whether they perceived that it was associated with a range of social, psychosocial, physical and mental health-related outcomes (*29*). Their main findings were that males identified more strongly with khat use than females, females cited the negative impact on health and self-esteem among the family as major concerns, and male abstainers were more likely than males who used khat to believe that khat use causes social problems.

Previous research has demonstrated an inverse relationship between risk or harm perception associated with using a particular substance and the actual use of that substance, particularly for smoking tobacco through a hookah (*30,31*) and using cannabis (*32*). An increased perception of risk has also been found to increase the intention to quit smoking tobacco (*33*). Thus, increased understanding of the difference in perception between those who use khat and those who do not may provide an initial framework for the development of interventions aimed at reducing khat-related harm.

To build on the understanding between drug use and perception of drug use in relation to khat, we conducted a study in a developed-country setting that investigated the differences in the perception of khat use being associated with health problems between people who do and people who do not use khat who were members of a diaspora where khat use is prevalent. We hypothesised that overall people who use khat will be less likely to perceive a positive association between khat use and health problems than people who do not use khat. Accordingly, we aimed to: describe the perceptions of physical and mental health and social problems for people who use khat and abstainer members of migrant communities in Australia; estimate the association between current khat use and perceived physical and mental health and social problems; and identify potential targets to inform

on harm minimization and educational interventions for people who use khat and those living in communities where khat use occurs.

Methods

Study design and participants

This study is part of a broader study which utilised Rapid Assessment Methodology (RAM) to examine khat use in Australia. The study consulted with key informants and health providers and used focus groups as well as the questionnaire methodology on which the current data is based. Rapid Assessment Methodology has been used to investigate psychostimulants previously in diverse social and cultural settings, having been asserted as effective (*34,35*).

The study design and participant recruitment have been detailed elsewhere (*5*). Briefly, participants were recruited through African community health liaison officers and snowball sampling. The participants were 133 adults (≥ 18 years) from African migrant communities in 4 state capital cities in Australia (Brisbane, Melbourne, Adelaide and Perth) recruited for the study between 1 April and 1 June 2012. There were 58 (43.6%) participants who reported current khat use, whilst the remaining 75 (56.4%) reported not using khat currently.

The Curtin University Human Research Ethics Committee approved the study, and community consultation showed support for the study methods.

Measures

Based on a review of the literature, 2 questionnaires were developed in English to identify potential health problems associated with khat use. One was developed for people currently using khat, with the other for abstainers. Regardless of their self-reported khat user status, each participant answered identical questions to assess their characteristics across a number of domains, including sociodemographic, alcohol and other drug use, and their perception of the impact of khat use on a range of physical and mental health conditions. Participants were asked to use a 5-point Likert scale to endorse whether they believed using khat was associated with specific health conditions that have been associated with khat use in the literature. Their responses were collapsed dichotomously with agree/strongly agree responses coded as an endorsement and all other responses (strongly disagree/disagree/neutral) coded as not endorsing the proposed effect of khat use on each specified health outcome. People who reported not currently using khat were also asked if they had used in the past. The questionnaires were translated into Amharic, Arabic, Somali and Swahili, the languages of the main geographic regions where khat is used. The relevant questionnaire was administered to participants based upon their current khat user status.

Statistical methods

Descriptive statistics were calculated for all measures. Fisher's exact test was used to compare differences be-

tween the khat user and abstainer groups for dichotomous and categorical outcomes. An independent samples *t*-test was used to compare time spent in Australia between these groups. Age was included in the questionnaire as a 4-category variable. In univariate analyses, age was analysed as a 4-category variable as well as a dichotomous variable (≤ 35 and > 35 years determined by reference to evidence suggesting that drug use behaviour changes by this age (*36*) and the practical constraints of the categories used to collect the data) to determine which was the most parsimonious format to be used for regression analyses.

Modified log-linked Poisson regression with robust error variance was used to model the association between khat use status and attitudes towards the health impact of khat use, as previously recommended (*37*). This valid alternative to logistic regression for modelling binary outcomes in cross-sectional studies (*38*) estimates relative risk instead of an odds ratio and, unlike logistic regression, is not subject to bias when the outcome is rare or exceedingly common (*39*). The adjusted model controlled for sex, age (as a 4-category variable), employment status, daily tobacco use and total years in Australia.

To test if close contact (i.e. in social or family settings) with people who use khat affects the perception of khat-related harms, we conducted subgroup analyses restricted to the abstainer group comparing the responses of abstainers who were living with a person who used khat at the time with those who were not. Additionally, we hypothesised that abstainers who had used khat previously may have different perceptions about the health problems of khat use compared to abstainers who had never used khat. Accordingly, we conducted subgroup analyses restricted to the abstainer group comparing the responses of those who reported previous khat use versus those who reported they had never used khat. All analyses were conducted using *STATA,* version 14.0.

Results

Group demographics are reported in Table 1. The khat user and abstainer groups differed statistically significantly in age (*P* = 0.042). Participants in the user group were statistically significantly more likely to report smoking tobacco daily (*P* < 0.001) and to have spent significantly fewer years in Australia (*P* = 0.037).

Fisher's exact test analyses of the proportion of participants who endorsed health outcomes associated with khat use in each group is displayed in Table 2. Abstainers were statistically significantly more likely than users to endorse that "khat use makes people lazy after use" (*P* = 0.003); "is bad for blood pressure" (*P* = 0.022); "is bad for the stomach and throat" (*P* = 0.002); and "makes people more unhealthy" (*P* = 0.050). There was no difference between the groups for endorsement that khat use does not affect health, with a reasonably large proportion of participants endorsing this in both groups (35.3% and 42.9% in the user and abstainer groups respectively).

The association between current khat use and the perceived harms due to khat use is reported in Table 3. After adjustment for model covariates, current khat users were less likely to perceive that "khat use makes people lazy after use" [prevalence risk ratio (PRR) = 0.86; 95% CI: 0.75–0.99]; "it is bad for the stomach and throat" (PRR = 0.83; 95% CI: 0.72–0.96); "it makes people more unhealthy" (PRR = 0.86; 95% CI: 0.75–1.00), whilst "it is bad for the teeth, gums, and mouth" (PRR = 0.81; 95% CI: 0.67–0.99). Significant unadjusted associations were observed between the khat user group and perceptions that khat use "makes people not eat properly" (PRR = 0.86; 95% CI: 0.75–1.00); "makes people anxious" (PRR = 0.86; 95% CI: 0.75–0.98); "is bad for the heart" (PRR = 0.85; 95% CI: 0.73–0.99); and "makes people hear voices or see things that are not real" (PRR = 0.87; 95% CI: 0.75–1.00), however these associations were attenuated to the null after adjustment for model covariates.

Subgroup analysis of abstainers who did and did not currently live with a person who used khat found no differences in association of khat use between the subgroups for all outcomes except for those who did not currently live with a person who uses khat being more likely to perceive that it makes people depressed (*P* = 0.017) (Table 4). No differences were observed between abstainers who reported using khat previously and people who reported never using khat.

Discussion

Evidence to inform the development of prevention strategies and culturally-appropriate interventions for migrant groups has been highlighted as a key component of inclusion health (*40*). A nuanced understanding of how people who use khat perceive health problems associated with its use is an important step in identifying specific targets for health promotion and education. Highlighting the specific khat-related health problems that we found are perceived differently by those using and abstaining from khat is likely to be an important component of any educational intervention.

Our findings suggest that our hypothesis was correct: people abstaining from khat are more likely than those using it to perceive that khat use resulted in poorer overall health. One contradiction in our data is that a relatively large proportion of participants in each group endorsed that khat use was not associated with health problems. It is likely that this questionnaire item was not well understood. Specifically however, abstainers were more likely than users to perceive that khat use has a negative impact on health generally, results in poorer oral health, contributes to stomach and throat problems, and makes people lazy. These findings are similar to those of Wedegaertner et al., who found people using khat had less concerns than abstainers about the negative effects of its use (*29*). Our findings also have similarities with prior research into cannabis and tobacco use that found

Table 1 Demographic characteristics of study participants (adults from African migrant communities living in Australia) at the time of questionnaire completion

Characteristic	Khat users (n = 58)		Non users (n = 133)		Total (n = 133)		P-value[a]
	No.	%	No.	%	No.	%	
Age (years)							*0.042*
18–25	21	36.2	14	19.2	35	26.7	
26–35	15	25.9	24	32.9	39	29.8	
36–45	10	17.2	22	30.1	32	24.4	
> 45	12	20.7	13	17.8	25	19.1	
Total					131	98.5	
Age (years)							*0.289*
≤ 35	36	62.1	38	52.1	74	56.5	
> 35	22	37.9	35	47.8	57	43.5	
Total					131	98.5	
Sex							*0.503*
Male	49	84.5	59	78.7	108	81.2	
Female	9	15.5	16	21.3	25	18.8	
Total					133	100.0	
Employment status							*0.703*
Full-time	24	41.4	34	46.6	58	44.3	
Part-time/ casual/ contract	16	27.6	18	24.7	34	25.9	
Student/home duties/ volunteer	9	15.5	14	19.2	23	17.6	
Unemployed/pension	9	15.5	7	9.6	16	12.2	
Total					131	98.5	
Consumes alcohol							*0.582*
Yes	7	12.7	7	9.6	14	11	
No	48	87.3	66	90.4	114	89	
Total					128	96.2	
Smokes tobacco daily							*< 0.001*
-yes	32	55.2	6	8.0	38	28.6	
-no	26	44.8	69	92	95	71.4	
Total					133	100	
Years spent in Australia	51	87.9	65	86.7	116	87.2	*0.037[b]*
	Mean	SD	Mean	SD	Mean	SD	
	7.37	5.64	9.78	6.44	8.72	6.19	

[a]*Fisher's exact test.*
[b]*Independent samples t-test.*

an inverse relationship between using a substance and the perceived risk associated with its use (*30,32,33*).

Our research expands on previous studies by Omar et al. (*8*), Zeleke et al. (*27*) and Wedegaertner et al. (*29*) which identified health problems perceived to be associated with khat use in communities where khat use is prevalent. Zeleke et al. reported that 92% of participants endorsed at least one khat-related health problem (*27*), but they did not compare perceptions of those using and those abstaining. Wedegaertner et al. did report differences in perceived harms associated with khat use between these groups (*29*), however they primarily focused on gender differences.

Our finding that people using khat were less likely than abstainers to perceive khat use being associated with oral health and stomach and throat problems is important in light of the evidence that khat chewing is associated with poor oral health (*41,42*) and digestive health problems (*13,43*). These health problems are obvious inclusions for any educational and health promotion efforts around khat use and its associated harms.

Our finding that abstainers are more likely than those using khat to perceive an association between khat use and laziness is interesting, with recent research into khat withdrawal identifying tiredness and poor motivation along with depression and irritability among the symptoms that were experienced at their

Table 2 Endorsement (agree/strongly agree) of health outcomes associated with khat use among adults from African migrant communities living in Australia: primary question "Do you think that khat affects peoples' health?"

Response	Khat user (n = 58)		Non-user (n = 75)		Total (n = 133)		P-value[c]
	No.	%	No.	%	No.	%	
No, it does not affect health	18	35.3	30	42.9	48	39.7	0.454
Total					121	91	
It makes people not eat properly	38	73.1	56	78.9	94	76.4	0.521
Total					123	92.5	
It makes people lazy after using	27	51.9	55	78.6	82	67.2	0.003
Total					122	91.8	
It makes people smoke more	38	74.5	48	69.6	86	71.7	0.682
Total					120	90.2	
It makes people anxious	32	60.4	52	75.4	84	68.9	0.114
Total					122	91.8	
It is bad for blood pressure	25	49.0	48	70.6	73	61.3	0.022
Total					119	89.5	
It is bad for the stomach and throat	29	55.8	60	82.2	89	71.2	0.002
Total					125	94.0	
It is bad for the kidneys	31	58.5	46	67.6	77	63.6	0.343
Total					121	91.0	
It is bad for the heart	27	51.9	49	70.0	76	62.3	0.059
Total					122	91.8	
People are more unhealthy	36	69.2	60	84.5	96	78.0	0.050
Total					123	92.5	
It is not good for teeth/gums/mouth	45	84.9	65	90.3	110	88.0	0.411
Total					125	94.0	
It makes people hear voices or see things that are not real	28	53.8	48	66.7	76	61.3	0.191
Total					124	93.2	
It makes people depressed	31	59.6	49	68.1	80	64.5	0.348
Total					124	93.2	
Khat is addictive	39	75.0	57	79.2	96	77.4	0.665
Total					124	93.2	

Fisher's exact test.

most severe level around 7 days after participants ceased using khat (*21*). These symptoms may be a factor in problems identified in communities where khat is used, such as family breakdown and unemployment (*28*) [unemployment being a particular challenge for African immigrants in Australia (*44*)]. Further research is warranted to develop withdrawal management strategies to assist individuals ceasing khat use, particularly during the first week of cessation.

Further research is needed to develop interventions for addressing khat use in communities where it is prevalent with the dual aims of reducing existing use and preventing uptake. Education to inform community members and leaders about khat-related harms should be a priority. Our findings suggest that it is important to include specific information about established oral (*42*) and digestive (*13*) health harms, as well as reduced motivation or sleeping difficulties following ceasing

khat use (*21*). The possibility that khat use can lead to dependence should also be highlighted (*9*). Additionally, hepatic disease (*45*) and mental illness (*17*) should be included in any materials developed. Previous research suggests that, given the cultural context in which khat is used, involving community leaders such as religious leaders in efforts to address and prevent khat use may be warranted (*46*). Efforts aimed at increasing awareness of khat-related harms should be accompanied by information about available assistance or treatment to cease use.

Our study had several strengths. The participants were members of migrant communities that have previously reported khat-related harm in Australia (*28*). Given that one of our primary aims was to inform interventions that target this group, their data are highly relevant. Although we generated a convenience sample, extensive community consultation and the use

Table 3 Modified log-linked Poisson regression of perceived harms for khat users and non-users among adults from African migrant communities living in Australia

Response	Unadjusted		Adjusted[a]	
	PRR (95% CI)	*P*-value	PRR (95% CI)	*P*-value
No, it does not affect health	0.98 (0.87–1.10)	0.724	1.04 (0.94–1.16)	0.449
It makes people not eat properly	0.86 (0.75–1.00)	0.043	0.91 (0.80–1.05)	0.205
It makes people lazy after using	0.81 (0.72–0.92)	0.001	0.86 (0.75–0.99)	0.038
It makes people smoke more	1.01 (0.84–1.21)	0.945	1.03 (0.88–1.19)	0.739
It makes people anxious	0.86 (0.75–0.98)	0.024	0.92 (0.80–1.05)	0.214
It is bad for blood pressure	1.00 (0.93–1.08)	0.986	1.02 (0.99–1.04)	0.130
It is bad for the stomach and throat	0.78 (0.69–0.87)	< 0.001	0.83 (0.72–0.96)	0.012
It is bad for the kidneys	0.91 (0.77–1.08)	0.284	0.98 (0.84–1.14)	0.799
It is bad for the heart	0.85 (0.73–0.99)	0.036	0.94 (0.81–1.10)	0.454
People are more unhealthy	0.84 (0.74–0.95)	0.007	0.86 (0.75–1.00)	0.043
It is not good for teeth/gums/mouth	0.91 (0.77–1.07)	0.277	0.81 (0.67–0.99)	0.035
It makes people hear voices or see things that are not real	0.87 (0.75–1.00)	0.044	0.94 (0.80–1.11)	0.485
It makes people depressed	0.87 (0.76–1.00)	0.052	0.91 (0.79–1.06)	0.238
Khat is addictive	0.98 (0.84–1.15)	0.812	1.09 (0.90–1.32)	0.390

PRR = prevalence risk ratio.
[a]Adjusted for sex, age, employment status, daily tobacco use and total years in Australia.

of focus groups contributed to the recruitment of this sample. Another strength was our use of African health liaison officers who were fluent in multiple African languages during interviews with participants. This, in combination with the fact that the questionnaires were translated into 4 additional languages, minimized the chances of information bias due to misunderstanding or misinterpretation during data collection.

One limitation of our study is our sample size, meaning we were underpowered to detect differences between groups in univariate analyses. Accordingly, our findings of differences between groups when endorsing laziness, bad for blood pressure, bad for the stomach and throat, and people being generally less healthy being associated with khat use warrant further investigation with a larger sample. Furthermore, our study design generated a convenience sample that may not be representative of the entire population of people who use khat and abstaining members of their communities. A further limitation is that our study investigated participants' perceptions

Table 4 Endorsement (agree/strongly agree) of health outcomes associated with khat use among the non-user subgroup (adults from African migrant communities living in Australia) according to whether they live with a khat user or not

Response	Lives with khat user				Total, n = 75		Total (subgroup)		*P*-value[a]
	Yes (*n* = 13)		No (*n* = 58)						
	No.	%	No.	%	No.	%	No.	%	
No, it does not affect health	5	45.4	25	43.1	30	43.5	69	92.0	1.000
It makes people not eat properly	8	66.7	48	82.8	56	80.0	70	93.3	0.240
It makes people lazy after using	7	58.3	48	84.2	55	79.7	69	92.0	0.057
It makes people smoke more	8	66.7	40	71.4	48	70.6	68	90.1	0.737
It makes people anxious	6	54.5	46	80.7	52	76.5	68	90.1	0.113
It is bad for blood pressure	9	75.0	39	70.9	48	71.6	67	89.3	1.000
It is bad for the stomach and throat	10	76.9	50	84.7	60	83.3	72	96.0	0.444
It is bad for the kidneys	8	66.7	38	69.1	46	68.7	67	89.3	1.000
It is bad for the heart	9	69.2	40	71.4	49	71.0	69	92.0	1.000
People are more unhealthy	10	76.9	50	87.7	60	85.7	70	93.3	0.380
It is not good for teeth/gums/mouth	12	92.3	53	91.4	65	91.6	71	94.7	1.000
It makes people hear voices or see things that are not real	6	46.1	42	72.4	48	67.6	71	94.7	0.100
It makes people depressed	5	38.5	44	75.9	49	69.0	71	94.7	0.017
Khat is addictive	10	76.9	47	81.0	57	80.3	71	94.7	0.711

[a]Fisher's exact test.

about health problems associated with khat; these are subjective, and should not be relied upon as further evidence of khat-related harm. Additionally, our findings may not be generalizable to migrant communities outside of Australia. We relied on self-report of a sensitive behaviour, making social desirability bias a possible factor. Lastly, our design is cross-sectional, so we are unable to make causal inferences.

Conclusion

There is some perception of khat-related health problems, both by people using khat and those abstaining, in communities where khat use is prevalent in Australia. However, people who use khat are less likely to perceive that khat use is associated with health problems than abstainers, particularly in relation to the digestive system and laziness. Targeted health promotion efforts should be aimed at both reducing use in groups already using and preventing initiation of khat use. Health promotion materials should include information on the oral, digestive, hepatic and mental health problems associated with khat use as well as highlighting the potential for dependence, withdrawal symptoms during cessation, and information on the assistance and treatment available to those wishing to cease using.

Consommation de khat et problèmes de santé perçus chez les migrants africains en Australie : une étude exploratoire

Résumé

Contexte : L'utilisation chronique du khat, une plante aux propriétés psychostimulantes, a été associée à des problèmes de santé physique et mentale. Des recherches antérieures ont révélé que les non-consommateurs de khat étaient plus susceptibles que les consommateurs de percevoir son utilisation comme étant associée à une mauvaise santé.

Objectifs : Notre objectif était d'identifier les différences de perception des problèmes de santé spécifiques liés au khat entre les consommateurs et les non-consommateurs.

Méthodes : En 2012, 133 adultes (≥ 18 ans) issus de communautés de migrants africains dans quatre capitales d'États d'Australie ont répondu à des questionnaires afin de déterminer s'ils percevaient des problèmes de santé spécifiques associés à la consommation de khat. La régression de Poisson log-linéaire multivariable a été utilisée pour comparer les perceptions des deux groupes et identifier les différences, avec ajustement en fonction de facteurs sociodémographiques, de la consommation de tabac et des années de vie passées en Australie.

Résultats : Au total, 58 (44 %) et 75 (56 %) participants ont déclaré consommer et ne pas en consommer de khat, respectivement, au moment de l'étude. La régression de Poisson log-linéaire ajustée a montré que les consommateurs de khat étaient moins susceptibles que les non-consommateurs de percevoir certains problèmes de santé et problèmes connexes associés à cette pratique, y compris une mauvaise santé en général [rapport risque/prévalence = 0,86 ; IC à 95 % : 0,75, 1,00] ; la paresse (rapport risque/prévalence = 0,86 ; IC à 95 % : 0,75, 0,99) ; les problèmes d'estomac et de gorge (rapport risque/prévalence = 0,83 ; IC à 95 % : 0,72, 0,96) ; et les problèmes de dents, de gencives et de bouche (rapport risque/prévalence= 0,81 ; IC à 95 % : 0,67, 0,99).

Conclusions : Les consommateurs de khat sont moins susceptibles de percevoir l'usage comme étant associé à des problèmes de santé que les non-consommateurs. La fourniture d'informations sur les problèmes de santé associés à la consommation de khat peut être une composante importante des stratégies et interventions de promotion de la santé visant à réduire au minimum les méfaits de cette substance.

تعاطي القات والمشاكل الصحية المُتصورة بين المهاجرين الأفارقة في أستراليا: دراسة استكشافية

كريج كمينج، جوليا بات، عبدي هرسي، أحمد توهو، جيسي ينج

الخلاصة

الخلفية: ارتبط إدمان تعاطي القات، وهو نبات له خصائص المُنبِّهات النفسية، بمشاكل بدنية ونفسية. وكشفت البحوث السابقة عن أن الأشخاص الذين لا يتعاطون القات كانوا أكثر ميلاً من متعاطيه لإدراك أن تعاطي القات يرتبط باعتلال الصحة.

الأهداف: هدفت هذه الدراسة إلى تحديد الاختلافات في إدراك أن تعاطي القات يرتبط بمشاكل صحية مُعينة بين متعاطي القات والذين لا يتعاطونه.

طرق البحث: في عام 2012، استكمل 133 بالغًا (≤ 18 عامًا) من مجتمعات المهاجرين الأفارقة في 4 مدن من عواصم الولايات في أستراليا استبيانات للتأكد من إدراكهم لارتباط تعاطي القات بمشاكل صحية مُعينة. واستُخدم نموذج انحدار بواسون المرتبط بسجل والمتعدد المتغيرات للمقارنة بين مفاهيم مجموعتين من الأشخاص وتحديد الاختلافات، مع التعديل وفقًا للعوامل الاجتماعية السكانية، وتعاطي التبغ، وعدد سنوات العيش في استراليا.

النتائج: بوجه عام، أفاد 58 مشاركًا (44٪) أنهم يتعاطون القات، بينما أفاد 75 مشاركًا (56٪) أنهم لا يتعاطونه. وأظهر نموذج انحدار بواسون المرتبط بسجل والمتعدد المتغيرات أن متعاطي القات كانوا أقل ميلاً عن غير متعاطيه إلى إدراك بعض الظروف الصحية والمشاكل المرتبطة بها بتعاطي القات، ويشمل ذلك اعتلال الصحة بشكل عام [نسبة خطر الانتشار = 0.86، بفاصل ثقة قدره 95٪: 0.75، 1.00]؛ والخمول (نسبة خطر الانتشار = 0.86، بفاصل ثقة قدره 95٪: 0.75، 0.99)؛ ومشاكل المعدة والحلق (نسبة خطر الانتشار = 0.83؛ بفاصل ثقة 95٪: 0.72، 0.96)؛ ومشاكل الأسنان واللثة والفم (نسبة خطر الانتشار = 0.81؛ بفاصل ثقة: 0.67، 0.99).

الاستنتاجات: من غير المرجح أن يدرك متعاطو القات ارتباط تعاطيه بمشاكل صحية معينة، مقارنة بغير المتعاطين. وقد يكون توفير معلومات بشأن المشاكل الصحية المرتبطة بتعاطي القات عنصرًا مهماً في استراتيجيات وتدخلات تعزيز الصحة الرامية إلى التقليل إلى أدنى حد ممكن من الأضرار المرتبطة بتعاطيه.

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Violence and abuse among working children in urban and suburban areas of lower Sindh, Pakistan

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Abstract

Background: Child labourers are exposed to an insecure environment and higher risk of violence. Violence among child labourers is an under-studied phenomenon which requires contextual assessment.

Aims: We applied Bronfenbrenner's ecological model (micro-, exo- and macro-system) to understand the interplay of individual, community, societal and policy context fuelling violence.

Methods: Focus group discussions and family ethnographies of child-labourers working in common occupational sectors of suburban areas of Sindh were carried out to gain in-depth understanding of their immediate environment and abuse (micro-system). Frequency of emotional, physical and sexual violence (5–14 years; $n = 634$) was also determined. In-depth interviews with employers (exo-system, $n = 4$) and key-informant-interviews of prominent stakeholders in Pakistan (macro-system, $n = 4$) working against labour/violence were carried out Thematic-content analysis was performed using *MAXQDA*, version 8.0.

Results: We estimated that 21%, 19% and 9% of children suffered from emotional, physical and sexual violence respectively. Child labourers' interviews indicated the existence of all forms of abuse at home and in the workplace; sexual violence by grandfathers was highlighted (micro-system). Children reported frequent scolding and insults in the workplace along with physical violence that could be fatal (exo-system). The legal environment of violence in Pakistan was considered deficient as it did not address the hidden forms (touching, kissing, etc.; macro-system).

Conclusion: We documented that all forms of violence were rampant among the child labourers, and improved efforts and comprehensive legislation is direly needed to alleviate the situation.

Key words: violence, child labour, sexual child abuse, physical maltreatment, Pakistan

Introduction

The World Health Organization (WHO) defines violence as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation" (*1*). Violence may include deprivation or emotional, physical or sexual harm to the victim (*2*). Violence against children is a significant public health concern globally (*3*): one billion children worldwide, aged 2–17 years, experience some form of violence annually (*4*). Every fourth adult underwent at least one form of violence during childhood, and about 12% of children were sexually abused in 2017 alone (*5*). About 90% of the global deaths due to violence occurred in low- and middle-income countries (*5*).

Violence is a complex process that occurs with the interplay of multiple factors: individual, personal relationships, community and societal factors (*6*). Proximal determinants of violence include the personal history and personality of the individuals; low socioeconomic household status; and exposure to violent families,

friends and peers, whereas poverty, unemployment, cultural norms and the legal environment form some of the overarching factors (*6*).

Exposure of child labourers to an unprotected environment is greater compared with other children, putting them at a higher risk of violence (*7*). The global burden of abuse among child labourers is not readily available, however the International Labour Organization identifies violence as a specific hazard for domestic child labourers, migrants and children working in mines (*8*). Violence poses long-term emotional and physical effects on children. The emotional effects include depression, anxiety, insomnia, low self-esteem, social isolation and panic attacks (*9*). These children are more likely as adults to suffer from poor mental health, drug and alcohol abuse, risky sexual behaviour and criminality (*10*). Physical violence is the leading cause of injury and death among children (*11*).

Pakistan has a high frequency of violence, although this is grossly underreported (*12*). Recently, there has been substantial increase in the reporting of violence in Pakistan. In 2016 alone, 4139 child sexual abuse cases, an alarming 11 cases per day, were reported (*12*). A population

representative survey (Multiple Indicator Cluster Survey, 2014) reported that 81% of the children in Punjab and Sindh provinces experienced violence in the form of aggression, punishment or violent behaviour by others (*13,14*).
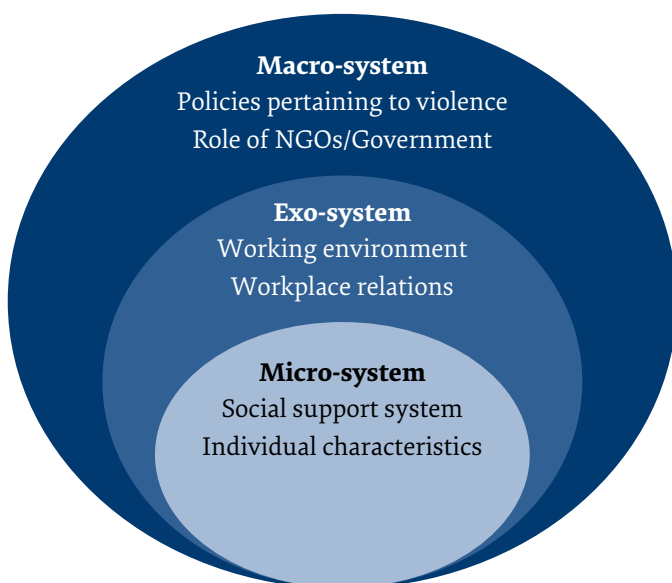
Pakistan harbours more than 12.5 million child labourers and the number is steadily increasing (*15*). There is dearth of literature regarding the various forms of abuse that the child labourers face. We designed this study to estimate the proportion of violence in various sectors of child labour in urban and suburban parts of lower Sindh. We also conducted contextual assessment to understand the individual, community, societal and policy factors playing a role in violence among child labourers.

Methods

Background

The study was a part of a larger project to assess the health and social status of child labourers in suburban areas of lower Sindh, Pakistan, carried out from May to December 2017. It was based on Bronfenbrenner's ecological framework, which considers the health of an individual to be affected by the environment in which he/she thrives, including his own attributes and lifestyle (micro-system), the working environment and the social support system (exo-system) and the policies of the government at the broad level (macro-system) (*16*). (Figure 1) Violence was assessed and explored at all 3 levels (as described above) to understand its existence and the environment in which it thrives.

Figure 1 The Bronfenbrenner's ecological model of study

Macro-system
Policies pertaining to violence
Role of NGOs/Government

Exo-system
Working environment
Workplace relations

Micro-system
Social support system
Individual characteristics

The qualitative exploratory inquiry for violence was carried out according to Bronfenbrenner's ecological model (*16*).

Micro-system

Focus group discussions (FGDs, *n* = 10) and family ethnographies (FEs, *n* = 9) for child labourers were conducted to explore their perspective regarding violence. Questions were asked pertaining to health, relationships with people, including neighbours, relatives and employers, and myths and fears of children. Direct inquiry about violence was not deemed suitable; thus, it was indirectly probed with tools, viz: sociogram, timeline and storytelling. The sociogram was used to explore the association of children with known people. Timelines assessed the daily routine of children, highlighting the window periods where they were vulnerable to violence. Storytelling (worst and best memory of life) provided snapshots of the children's lives pointing towards any memories of violence.

We also conducted a quantitative survey to determine the proportion of violence. Children aged 5–14 years working in the agricultural sector, the manufacturing industry and hotels and restaurants along with domestic workers and migrants were recruited by respondent-driven sampling and interviewed (*n* = 634). The details of the sampling technique, sample size assumptions and methodology are specified elsewhere (*17*). A pictorial tool (sketches depicting violence) was created to represent emotional, physical and sexual abuse and tested for face validity. The tool was administered by trained interviewers.

Exo-system

In-depth interviews of the children's employers helped gain insights into the exo-system. Four in-depth interviews of employers/caretakers of children were conducted to develop an understanding of their working relations and environment. All forms of violence were directly questioned and probed from the employers (Table 1). The FGDs and the FEs with the children also helped gain insights into the working environment.

Macro-system

Key informant interviews with important stakeholders (*n* = 5) working against child labour and violence casted light on laws and policies against abuse and labour in Pakistan (Table 1). The purpose was to gain insights regarding the factors, experiences, challenges and gaps in the policies and programmes pertaining to presence of violence among child labourers. Nongovernmental organizations working in Pakistan for child labourers were contacted and the snowball technique was used for inclusion of further stakeholders. The representatives of the International Labour Organization, the Society for the Protection of the Rights of the Child (SPARC), the Pakistan Institute of Labour Education and Research (PILER) (working for the rights of the working class), and the representatives of Aahung and Sahil (working against vio-

Table 1 Distribution of participants in the qualitative inquiry (n = 29)

Participant	Data collection tool					
	Focus group discussions (n = 10)		Family ethnographies (n = 9)		In-depth Interviews (n = 4)	Key informant interviews (n = 6)
	Boys	Girls	Boys	Girls		
Child labourer						
Agriculture	1	1	1	1	–	–
Manufacturing	1	1	1	1	–	–
Hotels & restaurants	1	–	–	–	–	–
Migrants	2	2	2	2	–	–
Domestic worker	–	1		1	–	–
Employers, etc.						
School teacher	–	–	–	–	1	–
Landlord	–	–	–	–	1	–
Factory owner	–	–	–	–	1	–
Social worker	–	–	–	–	1	–
Stakeholders						
Aahung	–	–	–	–	–	1
PILER	–	–	–	–	–	1
ILO	–	–	–	–	–	1
Sahil	–	–	–	–	–	1
SPARC	–	–	–	–	–	1

PILER = Pakistan Institute of Labour Education and Research.
ILO = International Labour Organization.
SPARC = Society for the Protection of the Rights of the Child.

lence) were included. The interviewees were questioned about the activities of the organization regarding child labour, their experiences, especially in the domain of violence against working children, the usual challenges in addressing labour and violence, the gaps present at the policy level and recommendations for improvement.

Analysis

The children were shown pictures of violence and asked to mark if they had experienced any such situation in the "past 1 month" for emotional abuse, "past 3 months" for physical and "ever" for sexual abuse (Figure 1). Any child with a single positive answer was considered a victim of violence. Proportions and frequencies of abuse were calculated. The Pearson chi-squared test was applied to determine the differences of the outcomes across the occupational groups. The data were analysed using *SPSS*, version 23 and *Stata*, version 8.

All qualitative interviews were developed as a semi-structured guide and were conducted by 2 trained research associates. They were audio-recorded and extra notes were taken where necessary. All the interviews were transcribed and translated, and thematic content analysis was done to synthesize the results (*18*). The qualitative data was analysed using *MAXQDA*, version 8.0.

Under the law of emancipation of minors, consent was obtained from the children prior to the interview. The

Ethical Review Committee of the Aga Khan University approved the study (ERC number: 4591-CHS-ERC-16).

Results

Micro-system

The mean age of the study participants was 10.9 years [standard deviation (SD) 2.1] (Table 2). Most of the children working in hotels and restaurants were boys (98.5%), domestic workers were mostly girls (87.3%); the rest of the occupational groups had a fairly balanced distribution between the sexes. Most of the agricultural workers (87.5%) were of Sindhi ethnicity, whereas Punjabis dominated among the manufacturing, domestic and hotel and restaurant sectors. The mean income per month was highest among the migrants and lowest among domestic workers; Rs 5688 and Rs 3338 respectively. On average 8.3 (SD 3.5) people lived in a household, and 45.9% of the children lived in *kacha* houses. Around a quarter of the children reported currently going to school; however, almost half said that they had previously attended school at least for a month.

The children experienced high frequency of emotional (20.8%), physical (19.1%) and sexual abuse (8.5%) (Table 3). There was a statistically significant difference comparing violence among the occupational groups (P = 0.01), all forms of violence being highest among the agricultural workers (emotional 28.2%; physical 27.2%; sexual 19.0%).

Table 2 Socioeconomic and demographic characteristics of child labourers (5–14 years) in suburban areas of lower Sindh according to occupational sector (n = 634)

Characteristic	Total (n = 634)	Migrants (n = 200)	Agriculture (n = 184)	Manufacturing industry (n = 120)	Hotels & restaurants (n = 67)	Domestic work (n = 63)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Age (years)	10.9 (2.1)	10.2 (2.2)	10.8 (1.8)	11.9 (1.7)	11.1 (1.8)	11.1 (1.9)
Sex						
Boys	322 (50.8)	127 (63.5)	74 (40.2)	47 (39.2)	66 (98.5)	8 (12.7)
Girls	312 (49.2)	73 (36.5)	110 (59.8)	73 (60.8)	1 (1.5)	55 (87.3)
Monthly income (Rs)[a]	4462 (3849)	5688 (4683)	3077 (2912)	5045 (4118)	4240 (2247)	3338 (2051)
No. of people living in the house	8.3 (3.5)	9.1 (3.3)	7.5 (2.4)	8.5 (4.7)	7.9 (3.6)	7.6 (3.1)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Ethnicity						
Sindhi	225 (51.8)	–	161 (87.5)	29 (24.2)	17 (25.4)	18 (28.6)
Punjabi	122 (28.1)	–	0	57 (47.5)	34 (50.7)	31 (49.2)
Other	87 (20.0)	–	12 (12.5)	34 (28.3)	16 (23.9)	14 (22.2)
Type of house[b]						
Pakka	153 (24.1)	3 (1.5)	10 (5.4)	75 (62.5)	27 (40.3)	38 (60.3)
Semi-pakka	190 (30.0)	3 (1.5)	91 (49.5)	39 (32.5)	38 (56.7)	19 (30.2)
Kacha	291 (45.9)	194 (97.0)	83 (45.1)	6 (5.0)	2 (3.0)	6 (9.5)
Currently going to school	174 (27.4)	59 (29.5)	34 (18.5)	55 (45.8)	7 (10.4)	19 (30.2)
Ever attended school	286 (45.1)	95 (67.4)	55 (36.7)	61 (93.8)	43 (71.7)	32 (72.7)

[a]*1 $US =124 Pakistan rupees.*

[b]*Pakka is a house built of cement; kacha is made of mud; and semi-pakka has straw, mud, wood and bamboo and sometimes a tin roof but no cement is used.*

***P-value for all variables was < 0.01 (Pearson chi-square test and one-way ANOVA).*

Emotional and sexual abuse were the least prevalent among children working in hotels and restaurants; 9.0% and 3.0% respectively. Physical abuse was lowest among domestic workers (12.7%). For emotional and sexual abuse, there was no difference between the sexes, but physical abuse was significantly more prevalent among boys (boys 23.3%, girls 14.7% P = 0.006) (Table 4).

The FGDs and FEs for the children indicated that the social support among the child labourers relied mostly on their parents and siblings, with less for friends and relatives. All the children expressed profound love and attachment for their mothers whereas they had a varied relationship with their fathers: some of them were loving and caring but some were physically abusive. Slapping and hitting with a stick were frequently reported. Most of the children lived in a joint family system and narrated an adverse affiliation with their grandfathers: "He curses

me and hits me with a stick when I don't work … (FGD, Migrant boy)".

Children did not directly report sexual violence. They reported that they felt frightened to go alone outside their houses. One girl reported that she felt insecure from men when she went outside (bangle industry); another girl (agricultural sector) reported being scared of visitors coming to her house. One of the domestic workers revealed that she quit school as it was not a "safe" place to go.

Exo-system

The FGDs, FEs and in-depth interviews for the employers provided insights at the level of the exo-system; thist focused on the dealings, relationships and violence in the workplace or school. Verbal abuse, yelling and cursing

Table 3 Violence among child labourers (5–14 years) in urban and suburban areas of lower Sindh according to occupational sector (n = 634)

Type of abuse	Total (n = 634)	Migrants (n = 200)	Agriculture (n = 184)	Manufacturing (n = 120)	Hotels & restaurants (n = 67)	Domestic work (n = 63)	P-value[a]
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	
Emotional	20.8 (17.8–24.1)	17.5 (12.8–23.4)	28.3 (22.2–35.2)	20.8 (14.4–29.0)	9.0 (18.6–4.0)	22.2 (13.5–34.2)	0.01
Physical	19.1 (16.2–22.3)	18.0 (13.2–23.9)	27.2 (21.2–34.0)	13.3 (8.3–20.7)	16.4 (9.2–27.3)	12.7 (6.4–23.5)	0.01
Sexual	8.5 (6.5–10.9)	4.5 (2.3–8.4)	19.0 (13.9–25.3)	5.0 (2.2–10.7)	3.0 (0.7–11.2)	3.2 (0.7–11.9)	< 0.001

[a]*Chi-square test.*

Table 4 Violence among male and female child labourers (5–14 years old) in suburban areas of lower Sindh, 20

Type of abuse	Sex		P-value
	Boys	Girls	
Emotional	19.8	21.8	0.552
Physical	23.3	14.7	0.006
Sexual	9.0	8.0	0.654

children's' parents were frequently reported, with most common reasons being late and inefficient at work.

Physical abuse was reported in almost all sectors of child labour. The migrant children working in the vegetable market typically reported being hit with a metal stake by the supervisors for negligence at work.

"The shopkeepers at the vegetable market hit the kids with a metal stake (a steel rod) … when they steal vegetables … once a kid died … the man who killed him picked up his gun … he hit the kid on the back of his head with the back of the gun … which caused him to die … the owner believed that the kid was stealing from him … the killer then ran away, but he was later taken to the police … (FGD, migrant boys)"

Physical abuse was also expressed as a frequent reason for school drop-out: "They would pull my ears and slap me, so I ran away from school" (FE, agriculture).

Contrary to the reports from the children, the supervisors (farmers, landlords, factory owners) denied any sort of emotional, physical or sexual abuse against the children. They considered work as healthy for children as they supported their families and learnt a skill that would help them in future. They considered the working environment a secure place for all children.

Macro-system

The information pertaining to the environment of the child labourers at the macro level was organized into themes of landscape, barriers and recommendations to alleviate violence.

Landscape/situation with regard to violence: It was recounted by one of the stakeholders that the laws and policies in Pakistan were inadequate to protect children from all forms of violence. The Pakistan Penal Code (Section 509) addressed sexual harassment as an overarching law but failed to take account of the hidden forms of violence such as touching, kissing, oral sex, exhibitionism, voyeurism, etc. However, it was emphasized that the country's judiciary had considerably improved in the past 2 decades as the judges were more sensitive to violence and quicker court decisions were being given, with cases resolving within a year (key informant interview, Sahil).

One of the respondents mentioned that talking about violence had always been difficult in the past, however with social media playing a pivotal role, the attitudes of people had started to change. It was no longer a distasteful topic to mention in front of the masses. Consequently,

the reporting of violence also had increased considerably, however, only the worst forms of abuse such as rape and sodomy reached the courts.

"In 2003 or 2004 we had 2 to 3 cases of sexual abuse per year, today we have over a hundred cases annually. One major thing missing in our data, that can be massive, is pornography and oral sex, you would not find a single case! (key informant interview, Sahil)"

Barriers to eliminating violence: The biggest barrier to eliminating violence was that perpetrators were usually relatives, neighbours or people known to the children and it was challenging for children or their families to raise voice.

"Abuse is always a power game … they always had some sort of control; physical or positional, over the children … if it is the grandfather or even a father who has sexually abused the child, it creates a situation where the mother might feel helpless, she can't do anything against them, where would she take her child?" (key informant interview, Sahil)"

Moreover, the shelter homes of the country (*Dar-ul-aman*) were generally not safe as there were growing reports of abuse in these asylums and the people had practically no place for sanctuary. For those who wanted to report violence, they were generally not aware of the intricacies of the legal process for reporting abuse. Even after reporting violence, the court proceedings were painful for the victim and the family. Many people withdrew their cases to escape the agony of repeatedly facing the perpetrator during court trials (key informant interview, Aahung).

Recommendations to alleviate violence: One of the stakeholders recommended revising the provincial legislation to form a comprehensive law addressing all forms of violence across the country. It was also advised that the court proceedings should be improved to make them less agonizing for the victims. It was proposed to put a screen between the perpetrator and the victim during court trials or to accept videos to spare the victim from going to the court.

The need to enhance community awareness regarding violence was strongly advocated by all stakeholders. It was proposed to add modules on violence into the curriculum of primary and secondary school children attending government or private schools. Schools should also incorporate educational videos on "good touch" and "bad touch", to familiarize and sensitize the children during early childhood. It was emphasized that many nongovernmental organizations were working in Pakistan against labour and violence, but the government was not actively involved in the matter. The Ministry of Labour normally needed to be on board as the nongovernmental organizations served only as a "drop in the ocean" and could not alleviate the situation without the involvement of the government.

Discussion

We report a high burden of emotional (20.8%), physical (19.1%) and sexual violence (8.5%) among child labourers working in Pakistan. Physical violence was more prevalent among boys than girls (23.3% vs 14.7%, $P = 0.006$); no statistically significant difference was observed for emotional and sexual abuse. Sexual violence was alarmingly high among agricultural workers (19.0%), and least among the children working in hotels and restaurants (3.0%).

The varied manifestations of child labour and violence means there are no concrete operational definitions for comparison with other studies. There is dearth of literature for violence among child labourers in Pakistan. The International Labour Organization determined that violence among working children aged 5–14 years was 20%, 31% and 59% in the coal mines ($n = 169$; Chakwal, Nowshera), bangle industries ($n = 527$; Hyderabad) and tanneries ($n = 152$; Kasur) respectively (19–21). Validated tools were not used in these surveys and physical and sexual abuse were not separately assessed; however, the estimates strengthen our findings. Another study carried out in Turkey estimated similar results: 21% for physical and 25% for sexual violence among child labourers ($n = 595$) (22). The reason for the high proportion of sexual abuse among agricultural workers was not clearly understood. These children mostly worked as part of a family enterprise; we assume that the close relatives were the perpetrators in the majority of cases as is also evidenced by other reports from Pakistan (12,23,24). The authors are also of the view that the agricultural fields provide an environment favouring promiscuity, fewer witnesses and easy escape by the perpetrators, affecting girls and boys equally. Even with such high numbers, we consider these underestimates as some of the children would not have wanted to disclose information considering the fear and stigma associated with abuse. The real situation might be worse.

Our qualitative inquiry reinforced our quantitative assessment and provided insight into the holistic picture of violence among child labourers in Pakistan. Similar findings were reported by children in Jordan where the employers shouted and insulted them when they made mistakes or refused to do some work (25). Physical abuse such as slapping, kicking and sexual abuse by "elder boys" were also stated as a means of "teaching discipline" and "testing manhood" respectively.

The key stakeholders reported that the community awareness, laws and judiciary of the country had improved over time, but support mechanisms for the families of the victims, including reporting of violence, court trials and safe shelter homes, were not present. A lot of importance was given to having a comprehensive provincial legislature addressing all forms of violence. More extreme cases of abuse (rape and sodomy) were coming to light but the milder forms (touching, kissing, etc.) remained largely unreported. The interviewees believed that the legislature addressing the milder forms will lead to a trickling effect towards prevention of abuse. It was recommended that education on violence be included in the syllabi of the schools, starting in early classes and reiterating its importance in the older classes. Since the government has both the mandate and the responsibility for education of children, it must be taken on board to manifest an impact.

We believe that this is the first study to quantify violence among child labourers in Pakistan. Although not all sectors of child labour were included in our study, the major groups were represented. Respondent-driven sampling, considered a robust technique for hidden populations, was utilized. The stakeholders represented the conspicuous nongovernmental organizations in Pakistan working against violence or child labour. However with a sample size of 5, the level of saturation was not reached. The authors believe that increasing the number of interviewees via the snowball technique could have added valuable information. Furthermore, representatives of the government were not included; their opinion would have provided further insight and also highlighted the hurdles in the policy ecosystem. Furthermore, the geographical focus of data for the micro- and exo-systems was limited to urban and suburban areas of lower Sindh, thus, the generalizability of our findings to whole country is not appropriate. A pictorial tool was created to collect quantitative data for abuse; although the face validity of the tool was established, criterion validity would have further strengthened our findings.

We recommend further research to assess violence and its risk factors in diverse cadres of child labourers, especially children working in the agricultural fields. We assume working children are a vulnerable group for abuse and violence because of the absence of social protection at a very early age. The government needs to explore this particular group as they remain in silent suffering.

Competing interests: None declared.

Violence et mauvais traitements parmi les enfants qui travaillent dans les zones urbaines et suburbaines du bas Sindh, Pakistan

Résumé

Contexte : Les enfants travailleurs sont exposés à un environnement précaire et à un risque accru de violence. La violence parmi ces derniers est un phénomène sous-étudié qui nécessite une évaluation contextuelle.

Objectifs : Nous avons appliqué le modèle écologique de Bronfenbrenner (micro- exo- et macro-système) pour comprendre l'interaction du contexte individuel, communautaire, sociétal et politique qui alimente la violence.

Méthodes : Des groupes de discussion thématique et des ethnographies familiales d'enfants travailleurs opérant dans des secteurs professionnels communs des zones suburbaines du Sindh ont été menés pour acquérir une compréhension approfondie de leur environnement immédiat et des abus (micro-système). La fréquence des violences émotionnelles, physiques et sexuelles (5 à 14 ans ; *n* = 634) a également été déterminée. Des entretiens approfondis avec des employeurs (exo-système, *n* = 4) et des entretiens avec des informateurs clés d'acteurs importants au Pakistan (macro-système, *n* = 4) œuvrant contre le travail/la violence ont été réalisés. Une analyse du contenu thématique a été mise en place à l'aide *du logiciel MAXQDA*, version 8.0.

Résultats : Nous avons estimé que 21 %, 19 % et 9 % des enfants respectivement souffraient de violences émotionnelles, physiques et sexuelles. Les entretiens avec les enfants travailleurs indiquaient l'existence de toutes les formes de mauvais traitements à domicile et sur le lieu de travail ; la violence sexuelle des grands-pères était mise en évidence (micro-système). Les enfants ont rapporté de fréquentes réprimandes et insultes sur le lieu de travail ainsi que des violences physiques qui pourraient être mortelles (exo-système). L'environnement juridique de la violence au Pakistan a été considéré comme déficient car il n'aborde pas les formes cachées (attouchements, baisers, etc. ; macro-système).

Conclusions : Nous avons documenté que toutes les formes de violence étaient répandues parmi les enfants travailleurs, et que de meilleurs efforts et une législation complète sont grandement nécessaires pour atténuer la situation.

العنف والإيذاء بين الأطفال العاملين في المناطق الحضرية والضواحي في السند السفلي، باكستان

ميشا إقبال، ظفر فاطمي، كوثر خان، أسعد نفيس

الخلاصة

الخلفية: يتعرض الأطفال العمال لبيئة غير آمنة ولخطر العنف بصورة أكبر من غيرهم. ويُعتبر العنف بين الأطفال العمال من الظواهر التي لم تُدرس بالقدر الكافي، مما يستلزم تقييماً سياقياً.

الأهداف: هدفت هذه الدراسة إلى تطبيق نموذج برونفنبرنر البيئي (النظام الجزئي والخارجي والكلي) لفهم التفاعل القائم بين الفرد والمجتمع والسياق المجتمعي والسياسي الذي يغذي العنف.

طرق البحث: أُجريت مناقشات المجموعات البؤرية ودراسات خصائص أسر الأطفال العاملين (الإثنوجرافيا) الذين يعملون في القطاعات المهنية الشائعة في ضواحي السند، وذلك لتكوين فهم متعمق لبيئتهم المباشرة والإيذاء الذي يتعرضون له (النظام الجزئي). كما تحدّد أيضًا تواتر العنف الوجداني والبدني والجنسي (5–14 عامًا؛ العدد = 634). وأُجريت مقابلات متعمقة مع أصحاب العمل (النظام الخارجي، العدد الخارجي = 4) ومقابلات مع مقدمي المعلومات الرئيسيين لأصحاب المصلحة البارزين في باكستان (النظام الكلي، العدد = 4) الذين يناهضون عمل الأطفال/ العنف ضد الأطفال. وأجري تحليل المحتوى المواضيعي باستخدام الإصدار 8.0 من برنامج MAXQDA.

النتائج: قدّرنا أن 21٪ و19٪ و9٪ من الأطفال كانوا يعانون من العنف الوجداني والبدني والجنسي على التوالي. وأوضحت المقابلات التي عُقدت مع الأطفال العاملين وجود جميع أشكال الإيذاء في المنزل ومكان العمل؛ كما ألقي الضوء على العنف الجنسي الذي يرتكبه الأجداد (النظام الجزئي). وأبلغ الأطفال عن تعرضهم بصورة متكررة إلى التوبيخ والإهانات في مكان العمل إلى جانب العنف البدني الذي قد يكون مميتًا (النظام الخارجي). كما أن البيئة القانونية للعنف في باكستان كان يشوبها القصور، إذ أنها لم تعالج الأشكال غير الظاهرة (اللمس، والتقبيل، إلى ما غير ذلك) (النظام الكلي).

الاستنتاجات: لقد وثّقنا أن جميع أشكال العنف كانت متفشية بين الأطفال العاملين، وهناك حاجة ماسة إلى تحسين الجهود ووضع التشريعات الشاملة للتخفيف من هذا الوضع القائم.

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Characteristics and treatment patterns of patients with type 2 diabetes in Lebanon: the DISCOVER study

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Abstract

Background: Lebanon is part of the global DISCOVER study, a global, noninterventional, multicentre, prospective study with 3-years of follow-up.

Aims: The aim of this study is to describe real-world clinical practice in terms of type 2 diabetes mellitus (T2DM) disease management and treatment patterns within Lebanon.

Methods: Baseline demographic and clinical parameters were captured on a standardized case report form, according to routine clinical practice at each clinical site.

Results: We recruited 348 patients. At the initiation of second-line therapy, mean duration of diabetes was 6.7 [standard deviation (SD) 6.5] years; mean HbA1c and fasting plasma glucose levels were 8.5% (SD 1.6%) and 178.7 (SD 56.5) mg/dL respectively. Almost half the patients were hypertensive (45.1%) or had dyslipidaemia (48.6%). Metformin monotherapy was used as first-line therapy in 56.9% of the patients and upfront dual therapy in 25%. The primary reason for changing first-line therapy was poor glycaemic control. The main factors in choosing the second-line therapy were efficacy, tolerability and hypoglycaemia.

Conclusion: Clinical inertia was evident in this cohort of patients as they had suboptimal glycaemic control at the time of enrolment and the initiation of second-line therapy. Treatment intensification is required to reduce diabetes-related adverse outcomes.

Keywords: DISCOVER study, type 2 diabetes, oral glucose-lowering agents, 2nd-line treatment, Lebanon

Introduction

The worldwide prevalence of type 2 diabetes mellitus (T2DM) is increasing, currently affecting around 425 million patients and is estimated to increase to 629 million patients by 2045 (1). It is well known that patients with T2DM are at high risk of developing micro- and macrovascular complications. The combination of lifestyle modifications and pharmacological treatment is necessary to achieve good glycaemic control, which significantly reduces the risk of both diabetes-related micro- and macrovascular complications (2–6).

According to the most recent International Diabetes Federation update, the prevalence of diabetes in the Middle East and North Africa region is 12.8%, and 45% of people living with diabetes in this region are undiagnosed (7). In Lebanon, the prevalence of T2DM is increasing, predominantly due to increases in obesity, an aging population and an increasingly sedentary lifestyle (8,9). In a recent national survey, the prevalence of T2DM was 8.5% (10). However, this was reported to be higher according to International Diabetes Federation report: in Lebanon, the prevalence of age-adjusted T2DM was reported to be at 12.6% (11). Therefore, further epidemiologic data are required to provide more accurate information about the incidence and prevalence of the disease, comorbidities, and management patterns of diabetes.

According to international guidelines, T2DM requires comprehensive management to reduce the risk of complications and improve quality of life. However, in many Middle Eastern countries, data on diabetes treatment and outcomes are limited. Additionally, few data have been captured on newer classes of glucose-lowering drugs. The ongoing DISCOVERing Treatment Reality of Type 2 Diabetes in Real World Settings (DISCOVER) study aims to address these knowledge gaps by providing real-world observational data on the use of second- and later-line glucose-lowering therapies in people with T2DM worldwide. DISCOVER (NCT02322762) is a 3-year long, noninterventional, multicentre, observational, longitudinal cohort study with 14 391 participants recruited from sites in 37 countries; J-DISCOVER

(NCT02226822) is being conducted in Japan with almost 2000 patients recruited (*12*). The study is designed to provide a worldwide evaluation of the current state of type 2 diabetes treatment. Moreover, DISCOVER will provide information about diabetes and its management and treatment in areas with a high prevalence of diabetes such as China, India and the Middle East and in regions which have not been adequately studied such as the Middle East and Africa (*12*).

The DISCOVER study's primary objective was to describe disease management patterns and disease evolution over 3 years in patients with T2DM initiating a second-line glucose-lowering therapy. The secondary objectives were to describe patient and treatment characteristics, capture treatment changes, capture outcomes such as achievement of treatment targets (e.g. HbA1c, body mass index, blood pressure), incidence of micro- and macrovascular complications, incidence of hypoglycaemic events, patient-reported quality of life, and health care resource use to assess factors associated with treatment choices and those associated with complications (*12*). In this report, we discuss the results of the baseline characteristics and treatment patterns of the DISCOVER study cohort from Lebanon.

Methods

In brief, the DISCOVER study is an ongoing, prospective, observational (non-interventional) study of patients with T2DM who are initiating a second-line glucose-lowering therapy. Full details of the rationale, methods and inclusion and exclusion criteria of the study are available elsewhere (*12*).

Patients ≥ 18 years of age with T2DM who were starting second-line glucose-lowering therapy (add-on or switching) after failure of first-line oral treatment were eligible and invited to participate in the study. The study was carried out from October 2015 to November 2019. All participants signed an informed consent form. Patients were excluded if they had type 1 diabetes or were receiving injectable agents as a first-line therapy. The study was carried out according to the International Conference on Harmonization of Good Clinical Practice after receiving the appropriate approvals from the ethics committee/institutional review board of each participating site (*13*). The investigators and the sites were selected based on data provided from peer-reviewed articles, World Health Organization reports, and a national country coordinator, taking into consideration the geographical distribution of the practices within the country and the different types of clinics and hospitals. All potential sites were invited to participate, and the number of sites was in line with the targeted sample size required from Lebanon and the potential recruitment of each site. Data collection was carried out using electronic standardized case report forms at baseline and at future routine visits at approximately 6, 12, 24 and 36 months within a window of 4 (±2) months of the routine follow-up visits. It is also worth noting that the protocol did not

require any mandatory follow-up visits to ensure that the study reflected routine clinical practice. The investigator was able to contact a patient via telephone to obtain the necessary information. The baseline data included socioeconomic and demographic information, vital signs, laboratory values and previous medical history, including diabetes history and complications, comorbidities, first- and second-line glucose-lowering therapy and reasons for change or choice of new therapy (*12*). Disease diagnosis, patient treatment intensification and the diagnosis of hypertension and hyperlipidaemia were made according to the judgement of the investigators; no guidelines were provided in the trial protocol.

The sample size was calculated based on the criteria that any qualitative variable at a frequency of 5–95% and with 200 patients should ensure a precision range of 3.0–6.9% at 95% confidence in any given group of patients to be analysed, including patients from one country or patients receiving a class of drugs or composite endpoints of microvascular or macrovascular complications (*12*).

All statistical analyses were performed using the *SAS* statistical software system. Primary and secondary variables were summarized using descriptive statistics. The descriptive statistics used for the study include mean, median, standard deviation, minimum and maximum for continuous variables and frequency for categorical variables. To assess the association of treatment class at baseline with clinical outcome variables, multivariate Cox models were used. Interim analysis was performed at the baseline and 1–2 years after the last patient was recruited (*12*).

Results

Altogether, 348 patients were recruited by 15 different endocrinologists/diabetologists in urban locations within Lebanon; 56.9% of the patients were male. Patient's mean age was 59.2 [standard deviation (SD) 10.3] years with a mean body mass index of 29.8 (SD 4.6) kg/m². The mean duration of diabetes was 6.7 (SD 6.5) years and the mean HbA1c and fasting plasma glucose levels were 8.5% (SD 1.6%) and 178.7 (SD 56.5) mg/dL respectively (Table 1). Around 63% of patients reported being educated to secondary level or to university/higher level. However, 40% of the patients were unemployed. The vast majority (72.4%) had health insurance coverage. Almost half the patients were hypertensive (45.1%) or had dyslipidaemia (48.6%) and were receiving treatment. Just over 25% reported being current smokers and 20.1% reported alcohol use. Diabetes-related micro- and macrovascular complications were documented in 14.1% and 12.1% of the patients, respectively (Table 1).

Metformin monotherapy was used as a first-line therapy in 56.9% of the patients and upfront dual therapy was used in 25.0% of the patient population (Table 2). As second-line antidiabetic therapy, dual therapy [metformin and dipeptidyl peptidase-4 inhibitors (DPP-4i)] was used in 47.4% of the patients and triple therapy (metformin, sulfonylureas and DPP-4i) in 10.9%. A

Parameter	Patients (n = 348)	
	No.	%
Sex, male	198	56.9
Main working status		
Employed/self-employed	182	52.3
Not working	139	40.0
Retired	12	3.4
Missing data	15	4.3
Health insurance coverage		
Private	129	37.1
Public/governmental	84	24.1
Mixed	39	11.2
No insurance	73	21.0
Missing data	23	6.6
Education level (years)		
No formal education	30	8.6
Primary (1–6)	67	19.3
Secondary (7–13)	146	42.0
University/higher education (13+)	74	21.3
Missing data	31	8.9
Tobacco smoking		
Non-smoker	210	60.3
Ex-smoker	43	6.8
Current smoker	91	26.2
Missing data	23	6.6
Alcohol drinking		
Lifetime abstainer	273	79.4
Former drinker	2	0.6
Drinker	69	20.1
Missing data	4	1.2
Hypertension	157	45.1
Hyperlipidaemia	169	48.6
Any microvascular complication	49	14.1
Any macrovascular complication	42	12.1
	Mean	SD
Age (years)	59.2	10.3
HbA1$_c$ (%)	8.5	1.6
Fasting glucose (mg/dL)	178.7	56.5
Duration of diabetes (years)	6.7	6.5
Body mass index (Kg/m²)	29.8	4.6
Systolic blood pressure (mmHg)	133.0	14.4
Diastolic blood pressure (mmHg)	77.5	8.1
Low density lipoprotein cholesterol (mg/dL)	109.2	38.6

target goal at the time of initiation of the new treatment was set in 63.2% of the patients. Nine patients reported that they experienced a major hypoglycaemia episode prior to initiating the second-line therapy in the year prior to the study. The main reason for changing the first-line therapy

was lack of efficacy (Table 3). The main factors for choosing the second-line therapy were efficacy, tolerability, and hypoglycaemia (Table 4).

Antihypertensive and lipid lowering drug therapy were prescribed as concomitant medications in 49.1% and 51.7% of the patients respectively (Table 5). Angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) and statins were the most frequently used antihypertensive and lipid lowering agents in 31.9% and 45.4%, respectively. Aspirin had low use, 16.4%, in this diabetes patient population.

Discussion

The DISCOVER study is an ongoing global comprehensive programme which aims to report treatment patterns after the initiation of second-line glucose-lowering thera-

Treatment	No.	%
First-line therapy		
Met (Mono)	198	56.9
SU (Mono)	22	6.3
DPP-4i (Mono)	5	1.4
Other (Mono)	3	0.9
Met+SU (Dual)	49	14.1
Met+DPP-4i (Dual)	32	9.2
Met+other (Dual)	2	0.6
Other dual therapy	3	0.9
Met+SU+DPP-4i (Triple)	21	6.0
Met+SU+TZD (Triple)	1	0.3
Other triple therapy	8	2.3
4 or 4+ therapy	4	1.1
Second-line therapy		
Met (Mono)	3	0.9
SU (Mono)	5	1.4
DPP-4i (Mono)	14	4.0
SGLT-2i (Mono)	7	2.0
Other monotherapy	5	1.4
Met+SU (Dual)	16	4.6
Met+DPP-4i (Dual)	165	47.4
Met+SGLT-2i (Dual)	6	1.7
Met+other (Dual)	5	1.4
SU+TZD (Dual)	4	1.1
Other dual therapy	9	2.6
Met+SU+DPP-4i (Triple)	38	10.9
Met+SU+TZD (Triple)	11	3.2
Other triple therapy	21	6.0
4 or 4+ therapy	33	9.5
Insulin (may also receive oral therapy)	6	1.7

MET = metformin, SU = sulfonylurea, DPP-4i = dipeptidyl peptidase-4 inhibitors, TZD = thiazolidinedione, SGLT-2i = sodium-glucose cotransporter 2 inhibitors.

Table 3 Reasons for changing first-line therapy in the study sample: 348 patients aged ≥ 18 years with T2DM who were starting second-line glucose-lowering therapy, Lebanon, 2015-2019

Reason for changing first-line therapy	No. (%) of patients
Lack of efficacy	315 (90.5)
Weight gain	27 (7.8)
Hypoglycaemic event	18 (5.2)
Side effect	9 (2.6)
Physician preference	7 (2.0)
Patient convenience/comfort	5 (1.4)
Developed acute disease	4 (1.1)
Affordability	2 (0.6)
Developed chronic disease	1 (0.3)

py in patients with T2DM. This baseline report represents the subgroup of T2DM patients from Lebanon, and provides an overview of the real-world clinical practice and treatment trends of patients with T2DM in urban locations within Lebanon.

Our participants were highly educated, but the reported rate of unemployment was high. A high unemployment rate has been shown to predispose patients to T2DM and poor glycaemic control (14). In a 2013 study, Azar et al. showed that a large number of Lebanese patients with T2DM had inadequate glycaemic control or were poorly followed-up (15). The current DISCOVER study demonstrated that baseline glycaemic level was suboptimal with a long duration of diabetes from the initial diagnosis. Some patients were reported to be hypertensive or dyslipidaemic and yet were not receiving treatment, which increases their cardiovascular risk, despite the fact that 34.5% of the Lebanese subgroup in this study were on dual, triple or even quadruple antidiabetic drug therapy as an initial treatment. This is explained by the progressive nature of T2DM over time and yet there was a delay in treatment intensification to achieve optimal glycaemic control.

Table 4 Reasons for choosing a second-line therapy in the study sample: 348 patients aged ≥ 18 years with T2DM who were starting second-line glucose-lowering therapy, Lebanon, 2015-2019

Reason	No. (%) of patients
Efficacy	273 (78.4)
Tolerability	85 (24.4)
Hypoglycaemia	84 (24.1)
Weight gain	66 (19.0)
Patient convenience/comfort	30 (8.6)
Cost	24 (6.9)
Patient request	12 (3.4)
Access reason	11 (3.2)
Other	22 (6.9)

However, the second-line glucose-lowering treatment showed that the diabetologists were keen on adding further drug therapy to achieve better glycaemic control. Dual, triple, and quadruple or more antidiabetic drug therapies were utilized in 76.3%, 20.1%, and 9.5%, respectively. HbA1c levels will be monitored in future visits over the 3-year period of the study as part of the routine clinical practice and the study protocol. This will provide valuable clinical information on the new combination of drug therapy and whether it has a favourable effect on HbA1c levels, adverse events, and micro- and macro-complications in these patients.

The drug therapy that was utilized the most as a first- and second-line therapy was metformin monotherapy and metformin and DPP-4 inhibitors combination, respectively. Sulfonylurea use was relatively low as a first-line treatment as monotherapy. However, the use of sulfonylureas was greater in combination with other antidiabetic agents despite the fear of hypoglycaemia and/ or weight gain. It is worth noting that the vast majority of the patients in Lebanon had health care coverage with few formulary restrictions, which enables physicians to freely prescribe antidiabetic medications.

Metformin, in conjunction with lifestyle changes, is recommended as a first-line therapy for patients with T2DM by most clinical guidelines (16–21). There is preferential recommendation for the use of novel antidiabetic agents over the traditional classes in multiple clinical settings (20,21). The DISCOVER study is considered essential because it generates real-world data that reviews trends in prescribing practices in different clinical settings and provides relevant data on diabetes management and clinical outcomes.

Table 5 Concomitant medications prescribed in the study sample: 348 patients aged ≥ 18 years with T2DM who were starting second-line glucose-lowering therapy, Lebanon, 2015-2019

Concomitant medications	No. (%) of patients
Concomitant antihypertensive drugs	171 (49.1)
ACEIs & ARBs	111 (31.9)
Beta-blockers	63 (18.1)
Calcium channel antagonists	23 (6.6)
Diuretics	36 (10.3)
Other antihypertensive drugs	11 (3.2)
Concomitant lipid-lowering drugs	180 (51.7)
High intensity statins	76 (21.8)
Low intensity statins	82 (23.6)
Fibrate	37 (10.6)
Niacin	0 (0.0)
Other lipid-lowering drugs	0 (0.0)
Concomitant antiplatelet drugs	66 (19.0)
Aspirin	57 (16.4)
Clopidogrel	12 (3.4)

ACEI = angiotensin converting enzyme inhibitors.
ARBs = angiotensin receptor blockers.

Our study may have some limitations, for instance patient and investigator selection bias. The investigators were carefully selected to be representative of the management of T2DM in Lebanon but the study did not include primary care physicians, perhaps due to challenges in infrastructure and/or the lack of experience in running clinical research. Patient selection bias could not be excluded because most of the patients were reported to have secondary or higher education, demonstrating that they were more educated and willing to participate in this observational study. In addition, we feel that cardiovascular risk factors such as smoking were under-reported by the participants and caution should be exercised when interpreting the results.

Conclusions

The baseline data of this cohort of the DISCOVER study from Lebanon demonstrated that there was a delay in the intensification of treatment and patients had suboptimal glycaemic control. The reasons could be attributed to several factors, which need to be further explored. An integrated approach to the management of T2DM considering metabolic, cardiovascular and renal risks is warranted to reduce the risk of micro- and macrovascular complications and is emphasized in recent international guidelines for the management of the disease (16–21). More efforts are needed to educate health care providers on strategies aimed at early intervention to ensure timelier and better control of glycaemic parameters and cardiovascular risk factors to delay or prevent T2DM-related complications.

Caractéristiques et modes de traitement des patients atteints de diabète de type 2 au Liban : l'étude DISCOVER

Résumé

Contexte : Le Liban fait partie de l'étude mondiale DISCOVER, une étude prospective internationale, non interventionnelle et multicentrique assortie d'un suivi de trois ans.

Objectifs : La présente étude a pour objectif de décrire la pratique clinique réelle en termes de prise en charge du diabète de type 2 et de modes de traitement au Liban.

Méthodes : Les paramètres démographiques et cliniques de référence ont été consignés dans un cahier d'observation standardisé, conformément à la pratique clinique habituelle de chaque site clinique.

Résultats : Nous avons recruté 348 patients. Au début du traitement de seconde interntion, la durée moyenne du diabète était de 6,7 ans [écart type (ET) 6,5] ; les taux moyens d'hémoglobine glyquée et de glucose plasmatique à jeun étaient respectivement de 8,5 % (ET 1,6 %) et 178,7 (ET 56,5) mg/dl. Près de la moitié des patients étaient hypertendus (45,1 %) ou présentaient une dyslipidémie (48,6 %). La metformine en monothérapie a été utilisée comme traitement de première intention chez 56,9 % des patients et une bithérapie initiale chez 25 % des patients. La principale raison du changement de traitement de première intention était un mauvais contrôle glycémique. Les principaux facteurs de choix du traitement de deuxième intention étaient l'efficacité, la tolérance et l'hypoglycémie.

Conclusions : L'inertie clinique était évidente dans cette cohorte de patients car leur contrôle glycémique était sous-optimal au moment de l'inscription et de la mise en route du traitement de seconde intention. Une intensification du traitement est nécessaire pour réduire les effets indésirables liés au diabète.

خصائص وأنماط علاج مرضى السُكّريّ من النمط 2 في لبنان: دراسة "DISCOVER"

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الخلاصة

الخلفية: يُعتبر لبنان جزءًا من دراسة "DISCOVER"، وهي دراسة عالمية استباقية غير تدخلية متعددة المراكز تضم 3 سنوات من المتابعة.

الأهداف: هدفت هذه الدراسة إلى وصف الممارسات السريرية في الواقع فيما يتعلق بعلاج داء السكّري من النمط 2 وأنماط علاجه في لبنان.

طرق البحث: سُجلت المثابتات السكانية والسريرية الأساسية في نموذج تقرير حالة موحد، وفقًا للممارسات السريرية الروتينية في كل موقع سريري.

النتائج: اختير 348 مريضًا. وعند بدء معالجة الخط الثاني، كان متوسط مدة الإصابة بالسكري 6.7 [بانحراف معياري 6.5] سنة؛ ومتوسط مستوى الجلوكوز ومرتسم الشحميات وخضاب الدم السكري (HbA1c) ومتوسط تركيز مستويات الجلوكوز في البلازما مع الصيام 8.5٪ (بانحراف معياري 1.6٪) و178.7 (بانحراف معياري 56.5) مليجرام/ ديسيلتر على التوالي. وكان ما يقرب من نصف المرضى مصاباً بارتفاع ضغط الدم (45.1٪) أو بعسر شحميات الدم (48.6٪). وقد استُخدمت المعالجة الأحادية بالميتفورمين بوصفها معالجة الخط الأول ومعالجة مزدوجة أمامية في 56.9٪ وفي 25٪ من المرضى على التوالي. وكان السبب الرئيسي في تغيير معالجة الخط الأول هو ضعف ضبط سكر الدم. وتتمثل العوامل الرئيسية لاختيار معالجة الخط الثاني في نجاعتها وإمكانية تحملها ونقص سكر الدم.

الاستنتاجات: كان القصور السريري واضحًا في هذه الفئة من المرضى، إذ كان التحكم في سكر الدم لديهم دون المستوى الأمثل وقت التسجيل وبدء معالجة الخط الثاني. ومن الضروري تكثيف العلاج لتقليل المخرجات السلبية المتعلقة بالسكري.

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The voices of the participants

Children

I am scared of my father, he hits me; he hits me with his hands and sticks... (FE, bangle industry) ... my brother abuses me, we punch each other when we fight; last time he hit me with a brick, it hit me here (pointing towards the forehead), it bled a lot ... I went to the hospital ... the doctor tied a bandage and gave some medicines (FGD, hotels & restaurants ... my elder brother hits me when I ask for money from him ... he gets angry and hits so hard with his hands on my legs and head.. my older sister also yells at me when I don't help her (FE, bangle industry) ... I had a fight with my elder brother when we were playing, I was using abusive language so he started hitting me (FGD, hotels & restaurants) ... Whenever a child steals fruits or vegetables from the vegetable market, they hit with a metal stake to punish... whosoever steals gets their heads severely injured.. the owners hit and then walk away ... sometimes they get slapped, sometimes they get hit at places which causes them to die (FGD, migrants) ... we are scolded and pushed away when we go to fill water from their tap ... (FE, migrants)

Stakeholders

You know what is missing in our data and which will be massive is pornography, oral you wouldn't even find a case ... you should see that there are 8 forms of sexual abuse. Out of these forms which are not reported is oral sex, pornography, prostitution, voyeurism and exhibitionism. Only rape and sodomy cases are reported... what I am trying to say this is a very small type of what sexual abuse involves. Or touching, do you understand? There is no law as such for touching ... sexual abuse is a taboo, yes. Especially if it's a girl, they don't want to report. In fact what we have seen is a great rise in sodomy cases. In the past, the ratio was 2/3, one-third boys and two-thirds girls. But now it has increased in boys, probably because they are confident now that these are the boys, but for girls it is still a taboo ... (Sahil)

You see our cruel numbers, the cases are increasing ... We take it positively, we say that at least they have dared to come up, at least they have reported the case. That means they trust us now. I would like to share an incident with you to show you the difficulty we face. This is a case of a young girl, she was about 12, was sexually abused by her *mamu* (uncle), he attempted it once and then again. The mother saw something on her daughter's pants and started beating the girl not understanding what it was ... the *mamu* threatened that little girl that he would kill her little sister if she told anyone ... he was a married man. The girl only kept saying to the mother "don't leave me alone" and didn't say anything what had happened to her. Once mother took her to the *mamu's* house and left her there ... there were children around and the other brother around too ... the *mamu* managed to disperse everyone at home ... she was left alone with him and he abused her... the mother of the girl arrived on the spot. So she caught him. Her husband was a security guard, so she immediately reported and got that medical done and they came to us,

I don't know how the case came to us. Now the girl was 100% wanting *mamu* to be prosecuted and then jailed, and we also hoped that he is jailed because for a victim it's a source of worry if the person is not jailed. Anyway we filed a case, halfway between the case the mother came and said she wanted to forgive his brother, she touched our feet and hands, her brother was also doing the same, her son offered 500 000 rupees to us. How difficult it is for a person to choose and resist that kind of thing. Then they went to the court and give her statement that she wanted to forgive the brother. That's where the sensitive judge came, he said "this is a crime against society, I am not letting him go". And he got that man convicted for 25 years. (Sahil)

Dar-ul-amans are not known for the best protection anywhere. That's a big tragedy. Day shelters may be okay. I don't think that that any shelters are safe. Abuse has been occurring. It's not safe. It is very difficult and then you have the capacity to differentiate between peer sexual interaction, which is another thing, and abuse by the workers ... the perpetrators abuse and they go straight to jail, then it's a whole process, so first is a lower court and the session court, from there bail has to be rejected, then he goes to the second court where he can appeal, then the trial starts, then he goes through the whole process, and then you gain hope that there is a conviction. We have seen very good changes too. We have seen a number of sensitive judges who say no this is a crime and we are going to punish it. Another positive thing is that they are giving quick decisions; otherwise it can take up to 5 years. So we have observed noticeable improvements over the period of 20 years, things have changed now ... (Sahil)

We have observed once a case has happened it's a difficult situation. Usually they are not strangers; they are closer ones, relatives and family members ... for example if it's the grandfather or even a father who has sexually abused the child, it creates a situation where the mother might feel helpless, she can't do anything against them, where would she take her child? ... But I think even when you are making a referral list, the problem is that there is no organization that is working specifically for the rehabilitation of child sexual abuse survivors. There is a dearth of services. We did the best we could, we made a list but I think the more important thing that Aahung is focusing on is within schools, to work with teachers, work with parents, and really create this awareness about prevention. Because once it's happened, within a context, it's very difficult to seek the support ... yeah exactly, teacher has a referral guide. Most of the time they call the mothers, they tell them. Most of the time, the mothers do intervene. It depends. For example, in case father is the one who has abused, it is a difficult situation. Because in that situation, the mother often feels that she doesn't have a choice ... I think that's a deeper structural issue, that's where I think the gap is in Pakistan, and I think it requires an intervention with the government to make them realize. There is no structure, they will pass all the laws and policies, they don't have any problem in passing the laws and policies, right, but the problem lies in the

operationalization … So I think that is the gap. People don't know where to report the case, if they have reported who is going to step in from the government to go and investigate each case. And in terms of accountability, and those who are involved in abuse, what I think we can do is that the referral guide we have, I can share it with you. It goes beyond abuse, it also focuses on their future, who would be counselling them. (Aahung)

Prevalence and sociodemographic correlates of medication intake adherence among primary health-care users in Albania

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Abstract

Background: Evidence about the magnitude and determinants of medication intake adherence among patients and the general population in Southeastern Europe is scant.

Aims: To assess the prevalence and sociodemographic correlates of medication intake adherence among adult primary health-care (PHC) users in Albania.

Methods: A cross-sectional study was conducted in 2018–2019 in a representative sample of 1553 adult PHC users (response: 94%) selected probabilistically from 5 major regions of Albania. There were 849 (55%) women and 704 (45%) men, with a mean age 54.6 (16.4) years. A structured interviewer-administered questionnaire inquired about medication intake adherence prescribed by family physicians, and sociodemographic characteristics. Binary logistic regression was used to assess the sociodemographic correlates of medication intake adherence.

Results: Three hundred (19.8%) participants did not take the prescribed medication. In multivariable-adjusted logistic model, significant correlates of nonintake of medication included rural residence, low educational level, unemployment and low economic level. Among these 300 participants, 273 (91%) considered the high cost of the drugs as a reason for not taking the medication.

Conclusion: We found a high prevalence of nonintake of medication prescribed by family physicians. Decision-makers and policy-makers in Albania and elsewhere should consider the provision of essential drugs free of charge or at low cost to low socioeconomic groups and other vulnerable and marginalized population categories, because the costs of noncompliance will eventually be higher.

Keywords: Albania, cost-related nonadherence, medication adherence, primary health care, sociodemographic factors.

Introduction

Health and pharmaceutical policies aim to achieve full coverage of all expenditure, including services and medications (1,2). Hence, effective reimbursement schemes are established globally to minimize out-of-pocket (OOP) expenditure, mainly for prescription-only drugs (3,4). Inability to achieve full coverage of expenses leads to copayments (5,6). Copayments for pharmaceuticals and other healthcare services, which are usually used by health insurers to reduce costs (4,7), may nevertheless incur a heavy financial burden on the population (4,8). This may be especially true in low socioeconomic groups and vulnerable populations that usually suffer the most (8,9).

Medication intake adherence is similar to adherence to medication, but different from compliance, and is the ability of patients to follow healthcare professionals' advice concerning dose regimen, route of administration, and interactions (10,11). There are many reasons for medication nonadherence. Older adults may forgo medication because of cost-related concerns, including lack of adequate prescription coverage by insurance programmes and OOP costs (12,13). Older age, female sex and unemployment may increase nonadherence, even after adjusting for possible confounding variables (14). Healthcare providers consider that educated patients are more likely to be adherent than their less-educated counterparts (14). Arguably, if a patient is highly educated, they should be able to receive the information and stick to it (15). Cost-related nonadherence (CRNA) may be defined as having no access to necessary medication because of limited personal financial resources (16,17).

Albania is a transitional country in the Western Balkans, characterized in the past few decades by rapid political and socioeconomic changes that have been associated with deleterious health effects (18,19). There has been a considerable change in the epidemiological profile of Albania, with a marked increase in noncommunicable diseases (20,21). The main risk factors responsible for the overall burden of disease include arterial hypertension, dietary factors and smoking (20,21). In Albania, medical reimbursement is based on the type of patients and

medication prescribed (22,23). Not all patients are entitled to full reimbursement for medication because of their category, or because some specific drugs may not be part of the government-approved reimbursement list (24). Regardless of the situation involving medication intake (prescribed vs over the counter), there are many cases where Albanian patients must make copayments (8,25). Many patients are sensitive to even modest increases in OOP expenses (2), whereas others do not reduce their medication because of cost concerns, even when they have a limited ability to pay (17). This situation often raises the question of whether to take the medication prescribed, mainly because of financial reasons (9,26,27).

There is scant evidence about the scale and determinants of medication adherence among Albanian patients at different levels of care, as well as in the general population. The issue of nonadherence to prescribed medication may be of particular concern to several vulnerable and marginalized population subgroups, especially those of low socioeconomic status (21). Such information is necessary to evaluate the implementation of ongoing reforms aimed at ensuring universal health coverage of the Albanian population (21).

The aim of our study was to assess the prevalence and sociodemographic correlates of medication intake adherence among adult primary healthcare (PHC) users in postcommunist Albania. We hypothesized a significantly higher prevalence of medication intake adherence among PHC users with higher socioeconomic status (employed, highly educated and wealthier individuals), and lower adherence among older patients and those with lower socioeconomic status.

Methods

Study design

A cross-sectional study was conducted of PHC users in 5 major regions of Albania (Tirana, Shkoder, Vlore, Fier and Diber) during December 2018–January 2019.

Study population and sampling

We recruited a representative sample of male and female PHC users aged ≥ 18 years in urban and rural areas of Albania, using a stratified, 2-stage cluster sampling technique in which a region was a stratum and a PHC centre was a cluster.

Based on different conservative assumptions about the prevalence and several sociodemographic correlates of medication adherence among PHC users in Albania, the anticipated minimal sample size was ~870 participants [the significance level (2-tailed) was set at 5%, and the power of the study at 80%]. Sample size was calculated using WINPEPI (28). To account for nonresponse and to increase the study power, allowing for additional and more refined hypothesis testing, we targeted recruitment of 1500 individuals aged ≥ 18 years (500 in Tirana and 250 in each of the other 4 regions).

In Tirana, 2 PHC centres (with probability proportional to size; PPS) were selected in urban areas and 2 in rural areas (also, with PPS). Conversely, in each of the other 4 regions, 1 PHC centre (with PPS) was selected in urban areas and another (with PPS) in rural areas. In each of the 12 selected PHC centres, consecutive samples of PHC users of both sexes aged ≥ 18 years were recruited until the anticipated quota was (at least) reached: 500 individuals in Tirana region (250 each in urban and rural areas) and 250 individuals in each of the other 4 regions (125 each in urban and rural areas). During data collection between December 2018 and January 2019, there were 1649 eligible individuals, and 96 were not included in the study: 39 were too sick to be interviewed, and 57 refused to participate. Hence, the study included 1553 individuals: 704 men and 849 women; overall mean age: 54.6 (16.4) years. The overall response rate was 94.2%.

Data collection

A structured interviewer-administered questionnaire was given to all individuals who agreed to participate. There were 15 interviewers involved in the field work in the 5 regions. All study participants were asked about adherence to medication prescribed by their family physicians. A total of 1516 individuals (98%) provided information about adherence to prescribed medication, whereas the remaining 37 were not prescribed medication. Three hundred participants who reported nonintake of medication prescribed by their family physicians were additionally asked to indicate which of the following 3 reasons were responsible for not taking the prescribed medication: high cost of the medication; treatment negligence (forgetting and/or skipping intake); and mistrust in the effectiveness/quality of the medication prescribed.

Demographic data included age (trichotomized into: < 40, 40–64.9 and ≥ 65 years) and sex, marital status (dichotomized into: married vs other categories – which included single, cohabiting, divorced or widowed), and place of residence (urban vs rural). Socioeconomic factors included educational attainment [low (0–8 years of formal schooling), middle (9–12 years), and high (≥ 13 years)], employment status (employed, unemployed or retired), and self-perceived economic level (dichotomized into: low vs not low).

Before conducting the survey, the whole questionnaire was initially pretested in November 2018 in 2 PHC centres in urban and rural areas of Tirana region. All survey questions were clearly understood by participants in different sociodemographic categories. The pretesting revealed comparable participation rates (95–97%) among different demographic and socioeconomic groups.

Ethics

The study was approved by the Albanian Committee of Bio-Medical Ethics in November 2018. All participants included in this analysis gave their consent after being informed about the aims and procedures of the study.

Data analysis

Fisher's exact test was used to compare the distribution of sociodemographic characteristics of PHC users by medication adherence based on the prescriptions provided by their respective family physicians. Binary logistic regression was used to assess the demographic and socioeconomic correlates (predictor variables) of medication adherence (outcome variable) among survey participants. Initially, crude (unadjusted) odds ratios (ORs: nonintake vs intake of medication prescribed by family physicians), their respective 95% confidence intervals (95% CIs) and P values were calculated. Subsequently, multivariable-adjusted logistic regression models were constructed, controlling simultaneously for all the sociodemographic factors (age, sex, marital status, residence, education, employment and economic status). Multivariable-adjusted ORs, their respective 95% CIs and P values were calculated. The multivariable logistic regression model met the goodness-of-fit criterion as appraised by the Hosmer–Lemeshow test (*29*). For all statistical tests, $P \leq 0.05$ was considered statistically significant. All statistical analyses were performed using SPSS version 19.0.

Results

The overall response rate was 94.2%. About 23% of study participants were aged 18–40 years, whereas 33% were ≥ 65 years. About 82% of individuals were married; ~58% were urban residents; ~43% had a low educational attainment (≤ 8 years of formal schooling); whereas ~23% had a higher educational level (≥ 13 years of formal schooling); ~29% were unemployed. The prevalence of self-perceived low economic status was 30% (data not shown).

Overall, 1516 individuals (98% of participants) provided information on adherence to medication prescribed by their respective family physicians (37 individuals were not prescribed medication). Of these, 1216 (80.2%) reported intake of the medication prescribed by their family physicians, whereas the remaining 300 (19.8%) did not take the prescribed medication. An analysis restricted to participants aged ≥ 55 years revealed a prevalence of nonintake of 18%.

Table 1 presents the sociodemographic characteristics of 1516 PHC according to medication adherence. There was no significant difference in prevalence of medication adherence between men and women, or married versus unmarried individuals. Conversely, the prevalence of medication adherence was significantly higher among older participants (≥65 years) than their middle-age (40–64.9 years) counterparts. The prevalence of medication adherence was significantly higher among urban than rural residents; among participants with higher educational attainment than in those with a low educational level; among employed compared to unemployed individuals; and among individuals with a middle and/or high economic status compared with low economic status.

In crude (unadjusted) logistic regression models (Table 2), there was evidence of a positive and significant

association of medication nonadherence with middle age (40–64.9 years), rural residence, low education level, unemployment and, in particular, economic level. In multivariable-adjusted logistic regression models, significant correlates of medication nonadherence were: nonmarried status, rural residence, low education level, unemployment, and especially, low economic status. About 22% of medication nonadherence was explained by the sociodemographic factors introduced into the multivariable-adjusted logistic regression models.

Among 300 participants who reported nonintake of medication prescribed by their respective family physicians (19.8% of the overall sample of 1516 individuals with valid data on medication adherence), 91% considered the high cost of the drugs as the main reason for not taking the medication (Table 3). Additionally, ~48% of participants reported negligence (forgetting and/or skipping intake of medications) as the second major reason for not taking the prescribed medication. Furthermore, 46% of these participants stated that mistrust in the effectiveness (quality) of the drugs prescribed was the third major reason for not taking the medication. Interestingly, 45% of participants in this subsample reported all 3 reasons for nonintake of medication prescribed by their family physicians. Conversely, there were 7 (2.3%) participants who did not report any reasons for not taking the medication.

Table 1 Sociodemographic characteristics and adherence to medication prescribed by family physicians of primary health care users in Albania

Variable	Drug intake (*n* = 1216)	Nonintake (*n* = 300)	P^a
Sex			0.137
Male	561 (81.9)[b]	124 (18.1)	
Female	655 (78.8)	176 (21.2)	
Age group			0.045
< 40 years	285 (81.4)	65 (18.6)	
40–64.9 years	510 (77.4)	149 (22.6)	
≥ 65 years	421 (83.0)	86 (17.0)	
Marital status			0.185
Married	998 (80.9)	236 (19.1)	
Other	218 (77.3)	64 (22.7)	
Place of residence			< 0.001
Rural	460 (73.4)	167 (26.6)	
Urban	756 (85.0)	133 (15.0)	
Educational level			< 0.001
Low (0–8 years)	460 (72.0)	179 (28.0)	
Middle (9–12 years)	434 (82.7)	91 (17.3)	
High (≥ 13 years)	320 (91.7)	29 (8.3)	
Employment status			< 0.001
Employed	428 (88.1)	58 (11.9)	
Unemployed	287 (66.4)	145 (33.6)	
Retired	489 (83.7)	95 (16.3)	
Economic level			< 0.001
Low	274 (60.5)	179 (39.5)	
Not low	941 (88.6)	121 (11.4)	

[a]*Fisher's exact test.*
[b]*Absolute numbers and percentages (in parentheses).*
Discrepancies in totals are due to missing values.

Table 2 Correlates of drug intake based on prescriptions provided by family physicians in a representative sample of primary health care users in Albania in 2018 (*n* = 1516)

Variable	Crude (unadjusted) models		Multivariable-adjusted models[b]	
	OR (95%CI)[a]	P[a]	OR (95%CI)	P
Sex		0.135		0.896
Female	1.2 (0.9–1.6)		1.0 (0.8–1.4)	
Male	1.0 (reference)		1.0 (reference)	
Age group		0.046 (2)[c]		0.862 (2)
< 40 years	1.1 (0.8–1.6)	0.544	0.8 (0.4–1.6)	0.587
40–64.9 years	1.4 (1.1–1.9)	0.017	0.9 (0.5–1.5)	0.638
≥ 65 years	1.0 (reference)	—	1.0 (reference)	—
Marital status		0.175		0.050
Other	1.2 (0.9–1.7)		1.4 (1.0–2.0)	
Married	1.0 (reference)		1.0 (reference)	
Place of residence		< 0.001		0.002
Rural	2.1 (1.6–2.7)		1.6 (1.2–2.1)	
Urban	1.0 (reference)		1.0 (reference)	
Educational level		< 0.001 (2)		0.009 (2)
Low (0–8 years)	4.3 (2.8–6.5)	< 0.001	2.1 (1.3–3.4)	0.003
Middle (9–12 years)	2.3 (1.5–3.6)	< 0.001	1.6 (1.0–2.6)	0.051
High ((≥ 13 years)	1.0 (reference)	—	1.0 (reference)	—
Employment status		< 0.001 (2)		< 0.001 (2)
Employed	0.7 (0.5–1.0)	0.045	1.4 (0.8–2.6)	0.255
Unemployed	2.6 (1.9–3.5)	< 0.001	2.9 (1.6–5.1)	<0.001
Retired	1.0 (reference)	—	1.0 (reference)	—
Economic level		< 0.001		< 0.001
Low	5.1 (3.9–6.6)		4.2 (3.2–5.6)	
Not low	1.0 (reference)		1.0 (reference)	

[a]*OR: nonintake versus intake of drugs prescribed by family physicians, their respective 95% CIs and P values from binary logistic regression.*
[b]*Adjusted simultaneously for all variables presented in the table.*
[c]*Overall P values and degrees of freedom (in parentheses).*
CI = confidence interval; OR = odds ratio.

Discussion

This study of a large and almost representative sample of PHC users in Albania showed a high prevalence of nonintake of medication prescribed by family physicians (18% in men and 21% in women). One out of 5 PHC users in not receiving their prescribed medication is a cause for concern. Significant independent correlates of nonintake of medication included rural residence, low educational level, unemployment and, in particular, low economic status. Importantly, these findings persisted upon adjustment for a wide range of demographic characteristics and socioeconomic factors. Evidently, poor and unemployed people can afford less to buy the prescribed drugs. Several socioeconomic factors included in logistic regression models were interconnected (e.g., individuals residing in urban areas or those with a higher education had more possibility to find a job and were less likely to be poor). Nonetheless, each of the 3 main socioeconomic factors (education, employment and economic status) turned out to be independent correlates of medication adherence in multivariable-adjusted models. Therefore, regardless of potential collinearity (a condition in which independent variables are highly correlated), each of these 3 key socioeconomic factors was a strong and significant independent predictor of medication adherence in this study population.

Similar to our findings, a previous study has reported no effect of sex, age, place of residence, body mass index, income, smoking, alcohol consumption, comorbidity and disease activity on medication adherence (*30*). On multivariate analysis, the predictors of adherence were the combined category of education, occupation and socioeconomic status, and disease duration (*30*). Another study showed that sex and socioeconomic status do not appear to influence nonadherence (*14*). Several studies have shown reduced adherence in ethnic minorities. Factors that may predict nonadherence include forgetfulness, illiteracy, inability to understand the purpose of treatment, not perceiving the treatment as necessary, lack of trust in the treatment, a lack of knowledge about the effects of treatment (*14*).

Morgan and Lee have presented data on the 12-month prevalence of CRNA for medication adherence among adults aged ≥ 55 years for 11 developed countries (*13*). Most countries ranged between 1.6% (France) and 8.3% (Canada), except the United States of America, which was an outlier with a substantially higher prevalence of CRNA (16.8%) (*13*). In comparison, Albania seemed to have a higher prevalence of CRNA. Our study included individuals aged ≥ 18 years; however, an analysis restricted to participants aged ≥ 55 years revealed a prevalence of nonintake of 18%, which is still higher than in all 11 countries included in the study by Morgan and Lee (*13*). Of note, the outcome

Table 3 Reasons for not taking medication prescribed by family physicians among primary health care users

Variable	No.	%
High cost	273	91.0
Negligence	145	48.3
Mistrust in the drugs prescribed	137	45.7
All three reasons	136	45.3
No reason	7	2.3

in the study by Morgan and Lee (12-year prevalence) was not exactly the same, but is nevertheless comparable with our operational definition of medication adherence, as they defined it as having reported CRNA at least once during the last 12 months (13). In our study, the outcome variable (medication adherence) referred to recently prescribed medication, thus, our estimate may be even higher if we include nonadherence during the past year.

Possible reasons for the higher prevalence of CRNA in Albania compared to other countries may include lack of coverage or partial coverage of drug costs by the health insurance scheme (23). Also, another driving factor may consist of the fact that medicines are relatively more expensive in Albania compared to developed countries. Indeed, assessment of prices of some defined drug categories (including antidiabetic and antihypertensive medication) in relation to the general cost of living indicates an unfavourable position of Albania compared to Western countries (26,27). The opposite is evident in countries such as the Netherlands where socioeconomic status is not a predictor of nonadherence, nonpersistence or reinitiation (31). This can be explained by the health insurance coverage of prescribed antihypertensive drugs, a study says (31). In Qatar, a study conducted regarding medication adherence among patients with uncontrolled diabetes showed that, although medicines are available at subsidized cost to Qatari and non-Qatari (only 20% of the total cost) inividuals, patients from deprived socioeconomic backgrounds found it difficult to pay for their medicines, leading to nonadherence (32). The same was shown in the study conducted on medication adherence, nonpersistence and reinitiation of antihypertensive drugs among patients on oral antidiabetic drugs in the Netherlands where, lower noadherence and nonpersistence rates can be expected, since patients are obliged to have health insurance, which covers most of the costs for prescribed antihypertensive drugs (31). A previous literature review has reported that the reduction of drug expenses through better insurance coverage can improve drug adherence (31). Although we did not assess this outcome, it is worth mentioning a study that showed that many patients reported the inability to understand the prescription or inadequate information about their treatment as a hindrance to medication adherence (30).

Our finding regarding a higher CRNA rate among people with a weaker financial background is not surprising. Nevertheless, the magnitude was remarkable

(OR = 4.2 poor vs not poor). Yet, our findings are compatible with a large American study that reported higher CRNA levels associated with a weaker financial background (lower income: OR = 1.59, or difficulty to pay bills: OR = 6.63) (33).

A 2018 study reported that CRN levels were higher among younger individuals, women, poor people and those with serious mental illness (12). Conversely, a survey conducted in Israel in 2012 reported that adherent patients were comparable to nonadherent patients in their demographic and socioeconomic characteristics (34). This study also reported that about 32% of the patients did not purchase the prescribed medication mainly because of their adverse effects and/or cost (34). Instead, in our study, 91% of participants did not take the medication because of its cost. A study conducted on adherence to medication in patients with inflammatory bowel disease showed that 6% of participants did not adhere to medication due to the cost of treatment (30).

There were several limitations to the current study including the possibility of selection and information bias as wells as the study design. This study included a probabilistic nationwide sample of PHC users in several regions of Albania, which points to an almost representative sample of the adult population attending PHC services. Nonetheless, nonusers may be different from users of PHC services regarding selected sociodemographic characteristics. Therefore, our findings cannot be generalized to the overall population, but should be confined to adult PHC users in Albania. Data collection consisted of a straightforward interviewer-administered questionnaire. All the interviewers were properly trained during a 2-day intensive course, and the questionnaire was initially pretested. There was no evidence of any information bias, given the initial pretesting of the instrument and also the proper training of all the interviewers regarding data collection and recording. Nevertheless, we cannot entirely exclude the differential reporting of medication adherence and/or the reasons for nonintake between various sociodemographic groups. Many factors are associated with nonadherence and they were not included in this study. Also, we did not include individuals who were seriously ill. It would have been interesting to know whether about 20% of the seriously ill individuals would not have taken the prescribed medication for financial reasons. The specific types of medication prescribed by the family physicians were not assessed in this study. A limitation of this study relates to the impossibility of defining the threshold for taking or not taking the prescribed medication (i.e., what price was perceived as too high). It would be interesting knowing if the patients refused to take relevant or essential medicines; information which was not retrieved in the current study. Finally, associations pertinent to cross-sectional studies are not assumed to be causal and, therefore, should be interpreted with caution.

Conclusion

Our study provides valuable and novel evidence about the extent and sociodemographic determinants of medication adherence among adult PHC users in a transitional South Eastern European population. Our findings should be replicated and confirmed in future studies and in different settings. Apparently, the magnitude of nonintake of medication is primarily linked to financial constraints, affecting especially the low socioeconomic groups and other vulnerable and marginalized population categories.

Decision-makers and policy-makers in Albania and elsewhere should consider the provision of essential medication free-of-charge or at very low cost to poor and lowly educated people, because the costs of noncompliance will be eventually higher.

Prévalence et corrélats sociodémographiques de l'observance thérapeutique chez les usagers des soins de santé primaires en Albanie

Résumé

Contexte : Les données sur l'ampleur et les déterminants de l'observance thérapeutique chez les patients et dans la population générale en Europe du Sud-Est sont rares.

Objectifs : Évaluer la prévalence et les corrélats sociodémographiques de l'observance thérapeutique chez les usagers des soins de santé primaires adultes en Albanie.

Méthodes : Une étude transversale a été menée en 2018-2019 auprès d'un échantillon représentatif de 1553 adultes usagers des soins de santé primaires (taux de réponse : 94 %) sélectionnés de manière aléatoire dans cinq grandes régions d'Albanie. Il s'agissait de 849 femmes (55 %) et 704 hommes (45 %), dont l'âge moyen était de 54,6 ans (16,4). Un questionnaire structuré administré par un enquêteur a permis de s'enquérir de l'observance thérapeutique pour les médicaments prescrits par les médecins de famille, et des caractéristiques sociodémographiques. La régression logistique binaire a été utilisée pour évaluer les corrélats sociodémographiques de l'observance thérapeutique.

Résultats : Trois cents participants (19,8 %) n'ont pas pris les médicaments prescrits. Dans le modèle logistique ajusté multivarié, les corrélats significatifs de la non-prise de médicaments comprenaient la résidence rurale, le faible niveau d'éducation, le chômage et le faible niveau économique. Parmi ces 300 participants, 273 (91 %) ont considéré le coût élevé des médicaments comme une raison de ne pas les prendre.

Conclusion : Nous avons constaté une forte prévalence de la non-prise de médicaments prescrits par les médecins de famille. Les décideurs et les responsables de l'élaboration des politiques en Albanie et ailleurs devraient envisager la fourniture de médicaments essentiels gratuitement ou à un coût très bas pour les groupes à faible revenu et les autres catégories de population vulnérables et marginalisées, car le coût de la non-observance sera en fin de compte plus élevé.

الانتشار والارتباطات الاجتماعية السكانية للالتزام بتناول الدواء بين مستخدمي الرعاية الصحية الأولية في ألبانيا

دجانا روشي، جينك بورازيري، سالفاتوري إيطاليا، بيتر شرودر-بيك، ألبان إيلي، هيلموت براند

الخلاصة

الخلفية: لا توجد أدلة تُذكر على حجم الالتزام بتناول الدواء ومحدداته بين المرضى وعموم السكان في جنوب شرق أوروبا.

الأهداف: هدفت هذه الدراسة إلى تقييم مدى الانتشار والارتباطات الاجتماعية السكانية للالتزام بتناول الدواء بين مستخدمي الرعاية الصحية الأولية في ألبانيا.

طرق البحث: أُجريت دراسة مقطعية في عامي 2018-2019 على عينة مُمثِّلة ضمت 1553 من مستخدمي الرعاية الصحية الأولية من البالغين (الاستجابة: 94٪) وقد اختيروا باحتمالية من 5 مناطق رئيسية في ألبانيا. واشتملت العينة على 849 امرأة (55٪) و704 رجلًا (45٪)، وبلغ متوسط أعمارهم 54.6 سنة (16.4). واستفسر استبيان منظم يديره محاور عن الالتزام بتناول الأدوية الموصوفة من أطباء الأسرة، والخصائص الاجتماعية السكانية لذلك. واستُخدم الانحدار اللوجستي الثنائي لتقييم الارتباطات الاجتماعية السكانية للالتزام بتناول الدواء.

النتائج: لم يتناول ثلاثمائة مشارك (19.8٪) الدواء الموصوف. وفي النموذج اللوجستي المُعدَّل متعدد المتغيرات، اشتملت الارتباطات المهمة لعدم تناول الدواء على الإقامة الريفية، وانخفاض المستوى التعليمي، والبطالة، وانخفاض المستوى الاقتصادي. ومن بين المشاركين البالغ عددهم 300 شخص، اعتبر 273 (91٪) ارتفاع تكلفة الأدوية سببًا لعدم تناولها.

الاستنتاجات: وجدنا ارتفاع معدل انتشار عدم تناول الأدوية التي يصفها أطباء الأسرة. وينبغي لصناع القرار وصناع السياسات في ألبانيا وفي أماكن أخرى أن ينظروا في توفير الأدوية الأساسية مجانًا أو بتكلفة منخفضة جدًا للفئات الاجتماعية الاقتصادية المنخفضة وغيرها من الفئات السكانية الضعيفة والمهمشة، لأن تكاليف عدم الامتثال ستكون أعلى في نهاية المطاف.

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WHO global meeting to accelerate progress on SDG target 3.4 on noncommunicable diseases and mental health[1]

Introduction

The World Health Organization Region for the Eastern Mediterranean is facing a double burden of the prevalence of malnutrition as well as overweight, obesity and diet-related noncommunicable diseases (NCDs) (1). For this reason, a new strategy on nutrition for the Eastern Mediterranean Region 2020–2030 (2) has been developed with input from Member States and United Nations (UN) partners and was adopted by the WHO Regional Committee for the Eastern Mediterranean in October 2019 (3). To address this issue, a global meeting took place in Muscat, Oman, from 9 to 12 December 2019 (4), which examined ways to accelerate progress on Sustainable Development Goal (SDG) target 3.4 on noncommunicable diseases and mental health (5). At the meeting, a regional side meeting on nutrition was organized to launch a new strategy on nutrition for the Eastern Mediterranean Region 2020–2030 (2). Country representatives from 17 Member States took part, along with WHO staff from the WHO Regional Office for the Eastern Mediterranean, WHO country offices, and expert consultants.

The objectives of the meeting were to:

- Support countries to operationalize a current national nutrition strategy and plan of action in order to achieve global and regional targets; and
- Provide a framework for countries to accelerate efforts to improve nutrition and food security through six key action areas of the UN Decade of Action on Nutrition (6).

Summary of discussions

A number of common challenges facing countries in implementing actions to improve nutrition were identified. Food and nutrition surveillance was one challenge shared by many countries, whereby the tendency for countries to prioritize representative national surveys was highlighted, however these require extensive resources and the process can be lengthy. Another key challenge relates to being able to monitor and evaluate the implementa-

tion and impact of the regional strategy and the priority actions highlighted within it. There were several other areas where the need for support to build capacity and/or technical guidance were identified. These include implementation issues, such as the drafting of legislations and design of policy measures to tackle the double burden of malnutrition. There were also challenges relating to communication and advocacy, including the difficulty in convincing other sectors/stakeholders of the importance of actions to improve nutrition, how to deal with opposition from groups of vested interests, and persuade donors of the need to invest in addressing all forms of malnutrition. The general need to raise awareness of these issues at all levels among policy-makers, professionals and the general public was recognized.

Recommendations

To WHO

- Implementing and strengthening food and nutrition surveillance systems;
- developing food-based dietary guidelines;
- developing and updating food composition databases; and
- developing guidance for general practitioners and other primary care professionals on the early identification and management of nutritional problems.

To Member States

- Improving nutrition education and introducing certification of nutrition practitioners;
- implementing the "International Code of Marketing of Breast-milk Substitutes" legislation;
- implementing programmes to deal with the high prevalence of acute malnutrition if present; and
- reviewing current plans for WHO country support in order to identify opportunities to add specific actions relating to identified needs.

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[1] This summary is extracted from the report on the WHO global meeting to accelerate progress on SDG target 3.4 on noncommunicable diseases and mental health: Side meeting on nutrition, Muscat, Oman, 12 December 2019 (https://www.who.int/publications/i/item/9789240004962).

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