

Original Research

Assessing health-related behaviors among Jordanian children during COVID-19 pandemic: A cross-sectional study

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Abstract

Background: The coronavirus disease identified in 2019 (COVID-19) led to extreme actions being taken by the governments to restrict the spread of this virus. Closure of schools, sport clubs and playgrounds were among these actions; children had to stay indoors and were not allowed to pursue their normal lifestyle activities. **Objectives:** To assess the differences in health-related behaviors among Jordanian school-aged children (6-16 years) before and during COVID-19 quarantine and to evaluate public's perception of the role of pharmacists regarding children's health-related behaviors management. **Methods:** A cross-sectional study was conducted from August 2020 to January 2021 using an anonymous web-based survey. The survey was developed based on previously published surveys. Evaluation of the validity and reliability of the survey were conducted by a professional committee of clinical pharmacists and a statistician. **Results:** A total of 230 children, aged 9.02 ± 2.977 participated in the study. Physical activity and healthy balanced meals decreased (less than 1 hr or 1-3 hrs/week vs 2 meals/day, $p < 0.001$), whereas daily screen time (1-3 hrs/week vs 4-6 hrs/week, $p < 0.001$), sleep hours (8-9 hrs/day vs 10-11 hrs/day, $p < 0.001$) and the ingestion of unhealthy snacks had increased (1-2 meals/day vs. 2-3 meals/day, $p < 0.001$). A positive perception of pharmacists' role during the pandemic was revealed. **Conclusion:** The present study showed that a significant change in children's health-related behavior happened during the COVID-19 pandemic. Such changes can lead to social, physical and mental health problems. The public perceived community pharmacists as trusted health care professionals during the pandemic.

Keywords: COVID-19; Quarantine; Pharmacists' role; Children; Health-related behavior

INTRODUCTION

On 11 March 2020, the World Health Organization (WHO) announced that SARS-CoV-2 was a global pandemic.^{1,2} On the 2 of March 2020, the Ministry of Health confirmed the first COVID-19 case in Jordan. Soon afterwards, the Jordanian government announced extreme actions to fight the pandemic and restrict the spreading of the virus.³ Among these actions, the unexpected cessation of school programs, sports, cultural clubs and playing areas forced everyone, including children, to stay home during the lockdown.

Although children do not seem to account for a large proportion of COVID-19 cases, the fact that most of the COVID-19 infected children were either asymptomatic or had mild to moderate symptoms makes children more likely to infect others,⁴ especially when the majority of them share households with elderly relatives.⁵

Because schools were shut down, children were temporarily deprived of institutional educational environments, social

contact with peers and adequate cognitive and physical stimuli for their age. This may potentially produce both mental and physical health problems.⁵ Along with the increase of time at home, TV viewing and use of PC, tablets and mobile phones are expected to increase; in fact, a recent study found that screen exposure increased by 4 h/day among children and adolescents during the COVID-19 lockdown in Italy.⁶ Moreover, the link between social isolation, lower physical activity levels and physical fitness in children was identified decades ago.⁷ Thus, an investigation of the impact of the COVID-19 lockdown on Jordanian children's health-related behaviors is deemed necessary.

Since the COVID-19 pandemic affected multiple aspects of everyday life, pharmacists were required to play an active role in controlling and minimizing its harmful impact.^{8,9} In addition to dispensing medications and helping patients in managing their chronic diseases, pharmacists play a key role in educating patients about the pandemic and the preventative measures that need to be taken, along with providing health supplies including masks, disinfectants, thermometers and the home delivery of medications during quarantine.^{10,11} Furthermore, pharmacists have a role in supporting local health care services to prevent and treat COVID-19¹² cases.

The present study aims to assess the effect of COVID-19 quarantine on children's health-related behaviors, including physical activity, screen exposure, sleeping pattern and eating habits; and to evaluate the community's perception about the role of health care professionals, mainly pharmacists, during the time of a pandemic.

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MATERIALS AND METHODS

Ethical approval

This study was granted an exemption from Institutional Review Board (IRB) review by the head of the IRB committee at Applied Science Private University numbered 2020-PHA-12. This study was conducted conforming to the Declaration of Helsinki and the code of conduct of research on human subjects in the country. The survey ensured the confidentiality and anonymity of the study participants. Moreover, a cover letter was included in the survey describing the nature and objectives of the study, inclusion criteria for participation, voluntary participation, and withdrawal. Furthermore, interested participants were requested to provide informed consent (electronic).

Study design and participants

A cross-sectional study was conducted from August 2020-January 2021 using an anonymous web-based survey. A snowball convenience sampling strategy was employed to recruit participants (parents and children over 14 years old, with the help of an adult) through social media i.e., Facebook, WhatsApp and LinkedIn. Parents and children who had the interest to participate could open a link and receive a detailed cover letter with electronic informed consent. The participants did not receive any form of compensation upon participation in this study.

Due to the unfolding situation of COVID-19, the data collection was carried out using an online survey. Online survey methodology has advantages in that it allows for the avoidance of any physical contact to minimize the spread of the virus, and helps eliminate geographical boundaries, which in turn enables reaching participants from different cities in Jordan. This has been addressed in a recent systematic review that reported on the effective use of social media platforms in health-related studies.¹³

It was estimated that the number of Jordanian citizens living in Jordan is around 10.554 million,¹⁴ hence, by using Open-Source Epidemiologic Statistics for Public Health (OpenEpi) Version 3.01, a sample size of at least 385 participants was required for our study (with 95% confidence level and 5% margin of error). Several eligibility criteria for participation were implemented, including (i) parents of children aged 6-16 years, or children aged 14 years old or older (ii) residents in Jordan during the pandemic, (iii) individuals who have consented to participate in this study voluntarily.

Survey instrument and related measures

The survey was developed after reviewing validated surveys in the literature and was designed using the general principles of good survey design.¹⁵ Google Forms[®] was used to create the online survey, which was designed in modern standard Arabic. Three sections, with a total of 24 questions, were included in this anonymous online survey. The first section consisted of 6 questions about the parent's/children's sociodemographic profiles. The second section consisted of 15 questions relating to the practice and attitudes of children aged 6-16 years before and during COVID-19 quarantine. The third section

assessed the participants' perceptions of the role of health care providers, particularly pharmacists, in the management of children's health and the lifestyle changes that occurred during the pandemic.

Validation and reliability

The initial draft of the survey was evaluated by the research team members and amended to enhance the clarity and readability of the study survey. The evaluation of the validity and reliability for the survey was conducted by a professional committee of clinical pharmacists and a statistician, confirming its applicability to the Jordanian population. The survey was then translated from English into Arabic and back by two senior academic staff members who are fluent in both languages. Then, the survey was evaluated and validated with a pilot sample of 25 academics and 25 non-academic people during a month-long pilot study to ensure the comprehension, clarity, readability and acceptability of the survey. Accordingly, modifications to the questions were made as needed before its implementation. Internal consistency reliability was tested by the Cronbach's alpha coefficient.

Statistical analysis

The completed surveys were extracted from Google Forms as an Excel sheet and were then exported to Statistical Package for Social Sciences version 26.0 (SPSS[®] Inc., Chicago, IL, USA) for the statistical analysis. The descriptive statistics included percentages, means, and frequency distribution, which were calculated for each question. Descriptive and Chi-square Kruskal-Wallis tests were used, which were conducted at a 5% significance level. A p-value of <0.05 represented a significant difference. The normality of the data was checked using the Shapiro-Wilk test.

RESULTS

Sociodemographic characteristics

A total of 230 children who were on average aged 9.02 (SD 2.977) participated in this study, of which 126 (54.8%) were boys. The majority of the participants (167, 72.6%) lived in Amman, the capital of Jordan, and the remainder were distributed across the country. The surveys were mainly completed by the children's mothers (183, 79.6%). More than half of the mothers were employed (127, 55.2%) and the majority of the participating children were in private schools (188, 81.7%). **Table 1** shows the sociodemographic characteristics of the participants.

Children's health-related behaviors

Table 2 shows the differences in health-related behaviors before and during COVID-19 confinement. The results strongly indicate a significant reduction in children's physical activity during the pandemic compared to before (p-value < 0.001); the majority of the children spent less than 1 hr or 1-3 hrs/week exercising during lockdown compared to 1-6 hrs/week before the pandemic. Football was the main sport played by the participants (18.7%) followed by martial arts (15.7%). Moreover, the results demonstrated a significant increase in



Characteristic	(Mean ± SD) or n (%)
Child age:	9.02±2.977
Child gender:	
• Female	104(45.2)
• Male	126(54.8)
Living place:	
• Amman, Capital	167(72.6)
• South of Jordan	4(1.7)
• North of Jordan	15(6.5)
• West of Jordan	8(3.5)
• East of Jordan	13(5.7)
• Central of Jordan	23(10.0)
Mother status:	
• Working	127(55.2)
• Not working	103(44.8)
Child school type:	
• Public	42(18.3)
• Private/ national	142(61.7)
• Private/ international	46(20.0)
Person who filled the survey:	
• The child with the aid of an adult	13(5.7)
• The mother	183(79.6)
• The father	13(5.7)
• An older brother or sister	17(7.0)
• Others	3(1.2)

Children's health -related behaviors	n (%)	p-Value*
Hours spent exercising per week by the child before the coronavirus pandemic:		< 0.001
• Less than 1hr weekly	30 (13.0)	
• 1-3 hrs	89 (38.7)	
• 4-6 hrs	82 (35.7)	
• 7-9 hrs	17 (7.4)	
• More than 10 hrs weekly	12 (5.2)	
Hours spent exercising per week by the child during quarantine because of the coronavirus pandemic:		< 0.001
• Less than 1hr weekly	118 (51.3)	
• 1-3 hrs	77 (33.5)	
• 4-6 hrs	18 (7.8)	
• 7-9 hrs	9 (3.9)	
• More than 10 hrs weekly	8 (3.5)	
The nature of physical activity the child usually does:		n/a
• Walking and jogging	31 (13.5)	
• Running	25 (10.9)	
• Swimming	25 (10.9)	
• Football (Soccer ball)	43 (18.7)	
• Horse-back riding	0 (0.0)	
• Martial sports (Taekwondo, Karate ...etc.)	36 (15.7)	
• Other	55 (23.9)	

Hours spent watching TV per week by the child before the coronavirus pandemic:		< 0.001
• Less than 1hr daily	103 (44.8)	
• 1-3 hrs	104 (45.2)	
• 4-6 hrs	20 (8.7)	
• 7-9 hrs	0 (0.0)	
• More than 10 hrs daily	3 (1.3)	< 0.001
Hours spent watching TV per week by the child during quarantine because of the coronavirus pandemic:		
• Less than 1hr daily	29(12.6)	
• 1-3 hrs	80(34.8)	
• 4-6 hrs	74(32.2)	
• 7-9 hrs	29(12.6)	< 0.001
• More than 10 hrs daily	18(7.8)	
Hours spent playing electronic games, on the mobile phones or tablets per week by the child before the coronavirus pandemic:		
• Less than 1hr daily	88 (38.3)	
• 1-3 hrs	106 (46.1)	
• 4-6 hrs	21 (9.1)	< 0.001
• 7-9 hrs	10 (4.3)	
• More than 10 hrs daily	5 (2.2)	
Hours spent playing electronic games, on the mobile phones or tablets per week by the child during quarantine because of the coronavirus pandemic:		
• Less than 1hr daily	11 (4.8)	
• 1-3 hrs	52 (22.6)	< 0.001
• 4-6 hrs	81 (35.2)	
• 7-9 hrs	51 (22.2)	
• More than 10 hrs daily	35 (15.2)	
Child's sleeping hours per day before the coronavirus pandemic:		
• Less than 8 hrs	20 (8.7)	
• 8-9 hrs	155 (67.4)	
• 10-11 hrs	52 (22.6)	
• More than 12 hrs	3 (1.3)	
Child's sleeping hours per day during quarantine because of the coronavirus pandemic:		n/a
• Less than 8 hrs	37(16.1)	
• 8-9 hrs	80(34.8)	
• 10-11 hrs	100(43.5)	
• More than 12 hrs	13(5.7)	
Did the child's waking hours change during quarantine because of the coronavirus pandemic, i.e., sleeping late at night and waking late in the morning?		n/a
• Yes	181 (78.7)	
• No	49 (21.3)	



Number of healthy meals (balanced meals including fruit, vegetables, protein...etc.) eaten by the child daily before the coronavirus pandemic:		
• 1	14 (6.3)	< 0.001
• 2	77 (34.7)	
• 3	113 (50.9)	
• 4	18 (8.1)	
• More than 4 healthy meals daily	8 (3.5)	
Number of healthy meals (balanced meals including fruit, vegetables, protein...etc.) eaten by the child daily during quarantine because of the coronavirus pandemic:		
• 1	36 (15.7)	< 0.001
• 2	68 (29.6)	
• 3	61 (26.5)	
• 4	44 (19.1)	
• More than 4 healthy meals daily	21 (9.1)	
Number of unhealthy meals (fast food, sweets, fizzy drinks, chips...etc) eaten by the child daily before the coronavirus pandemic:		
• 1	74 (32.2)	< 0.001
• 2	100 (43.5)	
• 3	44 (19.1)	
• 4	6 (2.6)	
• More than 4 healthy meals daily	6 (2.6)	
Number of unhealthy meals (fast food, sweets, fizzy drinks, chips...etc) eaten by the child daily during quarantine because of the coronavirus pandemic:		
• 1	40 (17.4)	< 0.001
• 2	65 (28.3)	
• 3	54 (23.5)	
• 4	32 (13.9)	
• More than 4 healthy meals daily	39 (17.0)	
How did the child's weight change during quarantine because of the coronavirus pandemic (during the past 3 months)?		
• It did not change (child's weight is the same as before the coronavirus pandemic)	83 (36.1)	n/a
• The child gained 1-2 Kg	62 (27.0)	
• The child gained 3-4 Kg	41 (17.8)	
• The child gained 5-6 Kg	27 (11.7)	
• The child gained more than 6 Kg	8 (3.5)	
• The child lost 1-2 Kg	3 (1.3)	
• The child lost 3-4 Kg	3 (1.3)	
• The child lost 5-6 Kg	0 (0.0)	
• The child lost more than 6 Kg	1 (0.4)	

*p-value based on Chi-square Kruskal-Wallis test

n/a: not applicable

screen time (p-value < 0.001). About two-thirds of the children spent 1-6 hrs/day watching TV during the lockdown, whereas before the pandemic, about 90.0% of them spent around 1-3

hrs/day or less than 1 hr/day. Similarly, more than 72% of the children spent at least 4-6 hrs/day playing video games during the lockdown whereas, before the lockdown, about 75% spent a maximum of 3 hrs/day on video games. Sleep patterns were also assessed; the results indicate that the majority of children (78.7%) suffered from a shift in their waking hours during quarantine, i.e., sleeping late at night and waking late in the morning. In addition, a significant increase in sleeping hours was observed (p-value < 0.001); around 50% of the children reported that they slept more than 10 hrs/day during the lockdown, whereas before the lockdown, only 24% of the children slept more than 10 hrs/day. Changes in the eating habits of the children were also reported; there was a significant reduction (p-value < 0.001) in the number of healthy balanced meals coupled with a significant increase (p-value < 0.001) in the number of unhealthy snacks; sweets, fizzy drinks, chips. However, this change in eating habits was not associated with a drastic change in body weight among most of the participants; almost 63% reported no change or a gain of only 1-2 kg.

Community's perception about the role of health care professionals during the pandemic

About half of the participants sought help and/or advice from pharmacists during the pandemic if their children were overweight or underweight (52.2%), if the child was more or less active than normal (51.3%), or if new concerns related to stress and increased irritation were noticed in the child's behavior (49.2%) (Table 3). There was a similar positive perception toward visiting pharmacists for other concerns, such as addressing any vision problems that emerged due to the increase in screen time (42.1%). Moreover, an appearance of problems related to the decrease or lack of concentration and focus of the child (48.3%), and excessive boredom and complaining (44.3%) were reported.

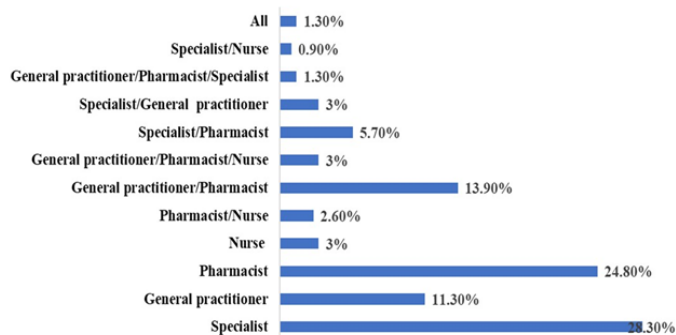


Figure 1. Participants' opinion regarding the ease of accessing different healthcare setting during the pandemic.

Figure 1 demonstrates the participants' opinions regarding the ease of access to different health care professionals during the pandemic. Less than one-third of the participants would seek help from a specialist (28.3%), followed by a pharmacist (24.8%), then from both a specialist and a pharmacist (13.9%), and only 11.3% would visit their general practitioner.

The reasons why the participants consulted a pharmacist were also investigated (Table 4). About 80.5% of the respondents agree/strongly agree that the ease of entering a pharmacy and talking to a pharmacist is one of the main reasons for reaching



Table 3. Community's perception about the role of the pharmacists during the pandemic

The Problem	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
The baby is overweight or underweight	48(20.9)	72(31.3)	35(15.2)	68(29.6)	7(3.0)
The child's more or less activity than usual	45(19.6)	73(31.7)	46(20.0)	59(25.7)	7(3.0)
New vision problems caused by long screen time	33(14.3)	41(27.8)	52(22.6)	96(41.7)	8(3.5)
New problems with lack of concentration in your child	43(18.7)	68(29.6)	38(16.5)	73(31.7)	8(3.5)
New problems related to stress and increased irritation of your child	39(17.0)	74(32.20)	37(16.1)	71(30.9)	9(3.9)
New problems arose, such as excessive boredom and complaining	35(15.2)	67(29.1)	37(16.1)	82(35.7)	9(3.9)
Any other new problems that may occurred	42(18.3)	62(27.0)	56(24.3)	61(26.5)	9(3.9)

Table 4. Participants' reasons for consulting a pharmacist about their children's health

The Reason	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
Ease of entering the pharmacy and speaking to a pharmacist	68(29.6)	117(50.9)	15(6.5)	26(11.3)	4(1.7)
Pharmacists' knowledge about children's general health	50(21.7)	97(42.2)	49(21.3)	30(13.0)	4(1.7)
Continuous presence of the pharmacist in the pharmacy even during the COVID-19 pandemic	59(25.7)	124(53.9)	20(8.7)	23(10.0)	4(1.7)
The pharmacist's knowledge about the healthy lifestyle habits and the possible use of vitamins and supplements to boost health	60(26.1)	104(45.2)	37(16.1)	25(10.9)	4(1.7)
The community's trust of the pharmacist's health related knowledge	56(24.3)	107(46.5)	35(15.2)	28(12.2)	4(1.7)

out to them. About 80.0% reported that the continuous presence of the pharmacist in the pharmacy, even during the pandemic, was another major reason. Furthermore, 70.9% of the participants responded with agreed/strongly agreed that they trusted pharmacists and their extensive experience in the health field, while 63.9% agreed/strongly agreed that the pharmacists' knowledge of their children's health were significant factors behind visiting pharmacists during the pandemic.

DISCUSSION

The present study provides valuable data regarding the impact of the COVID-19 pandemic on health-related behaviors among Jordanian children, and to the best of our knowledge, it represents an unprecedented set of statistics regarding the restriction of children's mobility during this health crisis in the Middle-Eastern region. Unfortunately, the findings of this study clearly indicate that the majority of the examined health-related behaviors worsened during the lockdown, including physical activity, screen time, sleeping patterns and eating habits.

It is well known that physical activity has numerous health benefits for all age groups. Several countries such as the United States, Australia, and Canada recommend that children should spend at least 60 min/day exercising.¹⁶ Predictably, a significant reduction in the number of hours spent exercising per week has been found among the children in this study. This is similar to the findings of a recent Italian study assessing the physical activity of Italian children and adolescents during COVID-19.⁶

The association between social isolation and lower levels of physical activity in children was established a few decades ago.⁷ Moreover, school closure has a crucial effect on the children's activity levels, especially during the COVID-19 pandemic. Hence, schools provide a suitable environment to encourage an active lifestyle among children, particularly due to physical education classes. It is noteworthy that the correlation between school closure and the rate of virus spread is not well established.¹⁹ Recent studies of COVID-19 have predicted that school shutdowns alone would prevent only 2-4% of deaths, which is much less than other social distancing interventions.²⁰ Furthermore, the apparent reduction in physical activity of children could also be due to the sample itself, given more than 80% of the children attended private schools. In the same context, Drenowatz et al. reported that children from a low socioeconomic status show a trend of lower physical activity levels and spend more time in sedentary behavior than high socioeconomic status children.²¹

The COVID-19 pandemic has significantly disrupted normal activities and increased time spent at home. Consequently, digital entertainment and screen exposure dramatically increased, including watching TV, use of PC, tablets, mobiles and video games.^{5,22} Herein, a significant increase (p-value < 0.001) in daily screen time was reported. It is important to mention here that the Government of Jordan is committed to ensuring learning continuity for children through distance learning during the COVID-19 pandemic.²³ Therefore, this may be an additional factor behind the increase in screen time. Besides, most have Jordanians worked from home during the COVID-19 pandemic and they consequently continuously use electronic devices. This might be one of the possible explanations for



the long screen exposure time among children. Studies have suggested that children's screen exposure is related to family behaviors and that children are highly affected by their parents.²⁴ Additionally, electronic devices serve as useful tools that aid in preventing children from distracting their parents during their work hours. Unfortunately, such prolonged screen time has been shown to negatively impact mental health, sleep patterns and/or physical health.²⁵ Moreover, excessive screen time has been associated with an increase in cardiovascular risk²⁶ and depression among children.²⁷

Sleep is undoubtedly important for the health and well-being of children. Several studies have shown that sleep deprivation is associated with a wide range of negative physical, social, emotional, and cognitive outcomes, including poor concentration, impaired academic achievements, an increased risk of obesity, depression, and suicidal ideation.^{28,29} Our study showed significant changes in children's sleep patterns and due to the significant changes to the children's everyday routines, sleep shift is expected. Similarly, Gupta et al. confirmed the association between poor sleep quality and shift in sleep cycle in adults during the COVID-19 lockdown,³⁰ which can be considered one of the factors that led to such changes in children's sleep patterns, since they are highly affected by their parents' behavior.

It is well-known that children who regularly have fast-food have a poorer diet quality due to higher total fat intakes and lower intakes of fruit and vegetables.³¹ A significant decrease in healthy balanced meals and a significant increase in unhealthy snacks has been reported. Similar findings were obtained by a recent study, where a higher consumption of red meat, potato chips, and sugary drinks was reported among Italian children and adolescents during the COVID-19 pandemic.⁶ On other hand, more than 60% of the children did not experience significant changes in their weight. It is worth noting that the findings from different cross-sectional studies suggest discrepant associations between frequent fast-food consumption and weight gain or obesity in children.³² The increase in screen time during COVID-19 may play a crucial role in bad eating habits, given such an association was also shown by a Brazilian study targeting adolescents.³³ Besides, another recent study demonstrated that a lack of social interactions during COVID-19 quarantine plays a possible role in stress-driven eating and drinking behaviors, which usually lead to poor eating habits.³⁴

About half of the participants trust pharmacists' advice regarding their children's health concerns that have emerged during the COVID-19 pandemic. This reflects the important role of community pharmacists during the pandemic, as noted in lower-middle-income countries³⁵ such as Jordan.³⁶

When the participants were asked about their opinion regarding the ease of access of various health care providers during the pandemic, specialist and pharmacists came at the top of the list, followed by general practitioners. About a quarter of the participants reported the importance of the ease of access to pharmacists, which is consistent with their role during the pandemic. Similar to other countries such as China,³⁷ Pakistan,³⁵ the United States¹¹ and various countries within Europe,³⁸ the

community's first point of care is the community pharmacy.

It was reported that pharmacists played various roles during the pandemic including infection prevention and control, proper storage of medications and their supply, patient care and support of other healthcare professionals.^{8,9,35}

The availability of pharmacists during the pandemic made it easier for people to seek help and advice from them. It is worth noting that there are about 2500 community pharmacies across Jordan, making them readily available.³⁹ Another reason to seek pharmacists for healthcare was the participants' trust in pharmacists' knowledge, which is similar to what was reported by Wazaify et al., that Jordanians think highly of the pharmacy profession.⁴⁰ A cross-sectional survey conducted in Jordan during 2020 targeting pharmacists to know their source of information regarding the pandemic found that the majority (more than 80% of the participants) of Jordanian pharmacists got their information from official sources like the World Health organization (WHO), the Centers for Disease Control and prevention (CDC) and the International Pharmaceutical Federation (FIP), making them reliable educators for the public.⁴¹ This was reflected in the same study by the number of pharmacists reporting that they were involved in educational activities targeting the public which was about 25% of those participated in the mentioned study.⁴¹

Limitations

There were 230 participants in the study, however the target was 380 participants. Not meeting this target could be due to various reasons, such as home-working and online school teaching, which could have made many parents too busy to complete the questionnaire. Additionally, parents' lifestyles also changed as a result of the lockdown, which might have made it difficult for them to keep track of the changes in their children's behavior and thus preferred not to participate in this study. The second limitation was the self-selection bias of the participants, given that the survey was conducted online, meaning only people who use the Internet and social media were able to participate. Another limitation is the representativeness of the sample, since most of the children were from private schools and were from the capital Amman, which may not be generalizable to other cities in the county.

CONCLUSION

The present study provides important data about the impact of the COVID-19 lockdown on children's health-related behaviors. The findings indicate that the majority of the examined health-related behaviors worsened during the COVID-19 pandemic, including physical activity, screen exposure, sleeping patterns and eating habits. Additionally, this study highlights the important role of pharmacists during the pandemic.

COMPETING INTERESTS

The authors declare that they have no competing interests.



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None.

AUTHORS' CONTRIBUTIONS

All authors distributed the questionnaire. ST, MB and SD wrote various parts of the manuscript. RQ did the data analysis and IB did the proofreading and English editing.

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