





JPHS 2020, 11; 75–80
© 2019 Royal Pharmaceutical
Society (RPSGB)
Received August 21, 2019
Accepted October 14, 2019
DOI 10.1111/jphs.12331
ISSN 1759-8885

Parental self-medication of antibiotics for children in Jordan

Tareq L. Mukattash^a , Mohammad J. Alkhatatbeh^a,
Shireen Andrawos^a, Anan S. Jarab^a , Rana K. AbuFarha^b  and
Mohammad B. Nusair^c 

^aDepartment of Clinical Pharmacy, Faculty of Pharmacy, Jordan University of Science and Technology, Irbid ^bDepartment of Clinical Pharmacy and Therapeutics, Faculty of Pharmacy, Applied Science Private University, Amman and ^cDepartment of Pharmacy Practice, Faculty of Pharmacy, Yarmouk University, Irbid, Jordan

Abstract

Objectives This study aims to describe the prevalence and predictors for parental antibiotics self-medication of their children and to characterize their knowledge, practice and attitude within this area.

Methods This is a cross-sectional study which targeted parents of children between the ages of 1–12 years. Parents were asked to fill out an online validated questionnaire that aimed to assess their knowledge, practice and attitude to self-medication of children with antibiotics.

Key findings In this study, 332/855 (39.2%) participants had previously self-medicated their child(ren) with antibiotics. The overall score in the knowledge section was satisfactory (mean = 3.48 out of five); however, the majority of participants (72.1%) did not have the knowledge that antibiotics are solely indicated for bacterial infections. Parents with older age, lower education, not working in a medical field, families with low-income and lived away from the capital were found to have higher rates of self-medication (P -value <0.05).

Conclusion The findings of this study show that there is a high prevalence of parental self-medication practice of antibiotics in Jordan that should be considered as alarming problem. The lack of adequate parental knowledge about the use of antibiotics may be a major cause of the increased self-medication among them.

Keywords international; patient satisfaction; quality of life; regulatory

Introduction

Self-medication is defined as the utilization of medicines in order to treat self-diagnosed disease or symptoms.^[1] It can also be defined as the intermittent or continued use of a prescribed drug for chronic or recurrent disease.^[1,2] Self-medication involves the reuse of old prescription drugs, purchasing from pharmacies, using leftover medicines prescribed for previous illness or sharing drugs with others.^[1–3] Responsible self-medication, on the other hand, involves the use of non-prescription medications for conditions for recurrent conditions that have been previously diagnosed by a healthcare professional or for conditions that can be easily self-diagnosed.^[2,4] Responsible self-medication has several advantages; it increases patients' accessibility to medicine for a faster relief of symptoms, reduces chronic patients' anxiety when they run out of pills and moves patients towards making decisions regarding their therapy, in addition to cost reduction on the healthcare system.^[1,2,5,6]

On the other hand, both responsible and irresponsible self-medications are associated with several risk that include incorrect self-diagnosis and choice of therapy, food and drug interaction, incorrect route of administration and masking of an underlying severe health condition.^[1–3,6]

The practice of self-medication is common in both developed and developing countries.^[7–9] Antibiotics are one of the most common drugs that are purchased without a prescription; it is estimated that over 50% of antibiotics are consumed through self-medication around the world.^[10] Self-medication or inappropriate use of antibiotics may lead to serious consequences to the public health and increase bacterial resistance. The

Correspondence: Tareq L. Mukattash, Department of Clinical Pharmacy, Faculty of pharmacy, Jordan University of Science and Technology, Irbid 22110, Jordan.
E-mail: tlmukattash@just.edu.jo

latter would result in longer-lasting illnesses, more health-care professionals visits, extended hospital stays, increased costs on medications and hospitalizations.^[10,11]

The prevalence of self-medication with antibiotics in the Middle East ranged from 19 to 82%.^[10] This prevalence was higher among men, individuals with low or medium income and low educational level.^[10] In Jordan, the prevalence of self-medication with antibiotics ranged from 30 to 64%.^[12–17] These are alarming numbers, despite the government efforts to enforce regulations that restrict access to prescription-only medication. The irrational and inappropriate use of antibiotics can lead to serious problems that include bacterial resistance, superinfections, avoidable adverse drug reactions and unnecessary costs.^[18] The practice of antibiotic self-medication among adults in Jordan has been described in the literature. To date, however, there is a limited evidence regarding parental self-medication of their children. Therefore, this study aims to describe the prevalence and predictors for parental antibiotics self-medication of their children. Moreover, the study aims to characterize parents' knowledge, practice and attitude to self-medication of children with antibiotics.

Methods

The present study aimed to reach a sample size of 1000 participants (parents not couples). However, researchers were only able to reach a sample size of 855 participants due to time constraints as this project was part of a postgraduate thesis.

Study design

A cross-sectional study using online survey was conducted during the period from March to May 2019 targeting people who are living in Jordan. Study participants included parents of children between the age of 1–12 years. The study was approved by the Institutional Review Board (IRB) in Jordan University of Science and Technology on 25 October 2018.

The questionnaire

The questionnaire was developed in Arabic after reviewing related studies. Most of the questions were extracted from previously published articles with similar research questions and objectives.^[13,19–25]

The first part of the questionnaire consisted of demographic characteristics of parents. The second part contained questions that examine the practices, knowledge and perceptions of parents towards antibiotics use in their children. Items were measured using a 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree.

The third part of the questionnaire targeted parents who previously self-medicated their children previously. This part explores details regarding the illness, for which the drug was given, the drugs used, duration, any adverse events if occurred, how they obtained the drug, the reason for selection specific drug, the reason for not consulting a physician.

The last part of the questionnaire aimed to assess parents' knowledge about antibiotics resistance. Participants' parents were asked about antibiotic resistance and the factors associated with its emergence. knowledge score about antimicrobial resistance was calculated.

To assess face validity, a pilot of 30 subjects from general population answered the final version of the questionnaire to assess readability and clarity of the questionnaire. Responses from the pilot sample were not included in the final results.

Ethical approval

The present study received ethical approval from the Institutional Review Board (IRB) at the King Abdulla University Hospital (KAUH), Jordan University of Science and Technology (JUST; REF: 58\118\118) in October 2018.

Data analysis

Data were entered and analysed with the Statistical Package for the Social Sciences (IBM, SPSS, Armonk, NY, USA), (version 25). The analysis of answers for questions consists of descriptive statistics that involved frequency and percentage for categorical variables and means \pm standard deviation (SD) or medians (lower–upper quartiles) for continuous variables.

Chi-square test was used to assess the relationship between each of knowledge, attitudes, practices and sociodemographic variables with self-medication practice. The level of significance was set at *P*-value of 0.05 or less.

Cronbach's alpha test was used to check the internal consistency of the questionnaire with a total score of 0.78 indicating that the tool used was valid for its purpose.

Results

Out of 855 parents who consented to fill the online questionnaire, 846 parents completed questionnaire. The majority of respondents were mothers (84.2%) with an age range between 30 and 39 years old (57%; Table 1). The majority of participating parents live in urban areas (84.9%) and primarily located in the middle of Jordan (i.e. capital region). The majority of participants and their spouses hold a university degree with health insurance (Table 1). In this study, 332 (39.2%) participants had previously self-medicated their child(ren) with antibiotic.

The overall score in the knowledge section was satisfactory (mean = 3.48 out of five). This indicates that the majority of participating parents have sufficient knowledge in multiple antibiotics indication and side effects. The majority of participants have the knowledge of the most common causative organism for influenza and cold (92%; Table 2). However, the majority of participants (72.1%) did not have the knowledge that antibiotics are solely indicated for bacterial infections (Table 2). They primarily reported that antibiotics are indicated for fever, sore throat and rhinitis.

The analysis of parents' attitudes towards antibiotics self-medication showed that most parents have positive

Table 1 Demographic characteristics of the study sample ($n = 846$)

Characteristic	N (%)	Self-prescription ⁿ (%)		P-value
		Yes	No	
Age				
20–29	202 (23.9)	59 (29.2)	143 (70.8)	<0.001
30–39	482 (57)	182 (37.8)	300 (62.2)	
40–49	137 (16.2)	75 (54.7)	62 (45.3)	
≥50	25 (2.9)	16 (64.0)	9 (36.0)	
Gender				
Male	134 (15.8)	61 (45.5)	73 (54.5)	0.105
Female	712 (84.2)	271 (38.1)	441 (61.9)	
City of residence				
North of Jordan	241 (28.5)	124 (51.5)	117 (48.5)	<0.001
Middle of Jordan	575 (68)	193 (33.6)	382 (66.4)	
South of Jordan	30 (3.5)	15 (50.0)	15 (50.0)	
Place of living				
City (i.e. urban)	718 (84.9)	276 (38.4)	442 (61.6)	0.257
Remote area (i.e. suburban)	128 (15.1)	56 (43.8)	72 (56.2)	
Education level for father				
High school or lower	111 (13.1)	57 (51.3)	54 (48.7)	0.005
University degree or higher	735 (86.9)	271 (37.1)	460 (62.9)	
Education level for mother				
High school or lower	94 (11.1)	49 (52.1)	45 (47.9)	0.007
University degree or higher	752 (88.9)	283 (37.6)	469 (62.4)	
Family income				
Less than 500	94 (11.1)	41 (43.6)	53 (56.4)	0.047
500–1000	325 (38.4)	141 (43.4)	184 (56.6)	
More than 1000	427 (50.5)	150 (35.1)	277 (64.9)	
Insurance				
Public insurance	136 (16.1)	64 (47.1)	72 (52.9)	<0.001
Military insurance	131 (15.5)	78 (59.5)	53 (40.5)	
Private insurance	397 (46.9)	114 (28.7)	283 (71.3)	
Uninsured	182 (21.5)	76 (41.8)	106 (58.2)	
Does father or mother work in a medical field?				
Yes	238 (28.1)	222 (36.5)	386 (63.5)	0.009
No	608 (71.9)	110 (46.2)	128 (53.8)	
Number of children				
1	212 (25.1)	47 (14.2)	165 (32.1)	<0.001
2–3	491 (58.2)	211 (63.6)	282 (54.9)	
≥4	143 (16.7)	74 (22.2)	67 (13.0)	
Does one of the children complain of a chronic disease (URTI, UTI or others) that requires frequent use of antibiotics?				
Yes	71 (8.4)	32 (45.0)	39 (55.0)	0.293
No	775 (91.6)	300 (38.7)	475 (61.3)	

attitudes. The majority of parents (95.6%) reported that physician is the only healthcare provider who should prescribe antibiotics (Table 2), while 24% of parents believe that previously prescribed antibiotics can always be effective to treat similar symptoms in the future (Table 2).

As for parents' practice towards antibiotics, nearly half of participating parents (44.9%) use antibiotic until symptoms resolve (Table 2). Moreover, 22.4% keep antibiotics or leftover antibiotics at home for emergency conditions, while 22.5% do not commit to physicians' recommendations and give their children antibiotics for symptoms of common cold and nasal congestion (Table 2).

Table 2 Parental attitudes, knowledge and practices regarding antibiotic use in children

Question	Number of parents agreed (%)
Parental knowledge on antibiotics indications and side effects	
Most symptoms of cough, influenza, cold that affect children result from	
Accepted answers: Viral infection	778 (92)
Antibiotics are used to treat:	
Accepted answers: Bacterial infections	508 (60)
Antibiotics situational use:	
Accepted answers: Bacterial infections	236 (27.9)
Antibiotics use may cause side effects as diarrhoea or allergy	
Accepted answers: Agree/strongly agree*	683 (80.7)
Giving antibiotic to the child without prescription may expose him to side effects	
Accepted answers: Agree/strongly agree*	737 (87.1)
Parental attitudes towards antibiotics use	
Physician is the only healthcare provider who should prescribe antibiotics	
Accepted answers: Agree/strongly agree	809 (95.6)
The antibiotic which I used after physician prescription will be always effective to treat similar symptoms	
Accepted answers: Disagree/strongly disagree	643 (24)
I prefer to give antibiotic for my children rather than wait until he becomes better without it	
Accepted answers: Disagree/strongly disagree	581 (31.3)
Parental practices towards antibiotics	
Antibiotics are used until symptoms resolve	
Accepted answers: Strongly disagree, disagree	466 (55.1)
I keep antibiotic or leftover antibiotics at home for emergency conditions.	
Accepted answers: Strongly disagree, disagree	655 (77.6)
When physician does not prescribe antibiotics for symptoms of common cold, nasal congestion or flu for the child, you commit with his prescription	
Accepted answers: Strongly agree, agree	664 (78.5)

*Strongly agree and agree were combined

Among participants who had previously self-medicated their children, they primarily administered amoxicillin, amoxicillin–clavulanic acid, azithromycin, cefixime and metronidazole. Overall, parents did not report any side effects with their self-medication practice (Table 3). Parents' preference for antibiotic of choice was based on frequency of administration daily (30.4%), taste (23.8%) and duration of treatment (19.6%; Table 3). Participating parents primarily purchased antibiotic from the pharmacies with a prescription (87%). Participants' reasoning for not consulting a physician prior to self-medication practice was their previous experience with antibiotic efficacy (36.4%) and their perception that symptoms do not require a physician consultation (Table 3).

Self-medication with antibiotics is significantly associated with several demographic and socioeconomic variables. Parents in the older age groups (≥50 years old) were more likely to self-medicate their children (Table 1). Parents who did not complete post-secondary education (P -value = 0.007) or do not work in a medical field (P -value = 0.009) practiced antibiotic self-medication with their children (Table 1).

Table 3 Antibiotics self-prescription practice among study participants (*n* = 332)

Statements	Number	%
Did you give antibiotics to your child without prescription previously?		
Yes	332	39.2
No	514	60.8
At what age?		
<1 year	18	5.4
1–5 years	172	51.8
6–10 years	105	31.6
11–12 years	37	11.1
Parents gave the drug (antibiotic) in order to:		
Treat the disease	307	92.4
Prevent disease occurrence	1	0.3
Both answers	24	7.2
The main factor to choose specific type of antibiotic was		
Acceptable taste	79	23.8
Require less number of times daily	101	30.4
Require less number of days	65	19.6
Others	87	26.2
Sources of antibiotics used		
Purchased from pharmacy	289	87.0
Available at home	33	9.9
Others	10	3.1
Did the child experience any side effect from antibiotic use		
No	20	94.0
Yes	312	6.0
Reasons for not consulting the physicians		
Symptoms are not severe and do not require physician consultation	121	36.4
I have a previous experience with drug efficacy	121	36.4
Lack of time	17	5.1
Lack of money	48	14.4
Others	25	7.7
You give your children antibiotics		
Always (95–100%)	6	1.8
Almost always (70–95%)	43	12.4
Frequently (30–70%)	58	17.5
Sometimes (5–30%)	201	60.7
Never (≤5%)	25	7.6
Medical conditions for which antibiotics were used		
Fever	137	41.2
Cough and common cold	44	13.3
Dysphagia	47	14.2
Ear pain	42	12.7
Other conditions	62	18.6
Source of information for antibiotic use		
Pharmacist	163	49.1
Previous experience	119	35.9
Medication package insert	34	10.2
Friends	4	1.2
Social media	3	0.9
Other	9	2.7

Statements	Strongly agree	Agree	Disagree	Strongly disagree	No opinion
Using them in unnecessary conditions.	156 (47.0)	141 (42.5)	20 (2.4)	7 (6.0)	8 (2.4)
Using without doctor consultation	81 (24.4)	162 (48.8)	71 (21.4)	8 (2.4)	10 (3.0)
No commitment with duration of treatment	149 (44.5)	140 (42.2)	29 (8.7)	5 (1.5)	9 (2.7)
Taking before meal	24 (7.2)	91 (27.4)	149 (44.5)	30 (9.0)	38 (11.4)
Drug–drug interactions	45 (13.6)	156 (47.0)	86 (25.9)	17 (5.1)	28 (8.4)
Frequent use of antibiotics	160 (48.2)	123 (37)	34 (10.2)	7 (6.0)	8 (2.4)

Moreover, families with low-income, military insurance and lived away from the capital were also found to have higher rate of self-medication (Table 1).

Discussion

This study aimed to investigate parents' knowledge, attitudes and practices towards antibiotic self-medication. Most participants were mothers, under 39 years, having 2–3 children, living in the middle of Jordan in the centre of the cities, having university degree or higher.

In this study, 60% of parents had the knowledge that antibiotics are used to kill bacteria not viruses. In Mongolia and rural China, nearly 20% of parents reported that antibiotics are used to treat bacterial infections.^[21,26] A higher level of knowledge in this regards was reported in Saudi Arabia (31.4%) and Macedonia (82%).^[26,27]

The majority of parents did not have the knowledge regarding the situational use of antibiotic; 72.1% of parents reported that antibiotics should be given to treat symptoms of fever, cough, rhinitis, colds and gastrointestinal tract infections. In other countries, 43–76% of parents reported similar answers.^[21,27,28] This misconception could be linked to the significant association of parents' low level of education and self-medicating their children. However, education is not solely responsible for this common practice. A previous study from Jordan reported that nearly 80% of antibiotics self-medication practice is allotted to flu, sore throat, diarrhoea and runny nose.^[17] Another study reported that over 70% of pharmacies practise unnecessary and improper dispensing of antibiotics.^[29] The prevalence of antibiotic self-medication among adults in Jordan influenced their practices to manage their children illness. A recent thematic analysis that characterized parental self-treatment of their children reported that parents' familiarity with symptoms influenced their choices.^[30]

While the majority of participating parents in the study agree that antibiotics should be prescribed, nearly one third of participants still prefer to give antibiotic to their children without consulting a physician. Studies from other countries suggest that parents prefer to self-medicate their children over long waiting time and high cost of clinic visits.^[31,32] Consistent with previous studies, parents in this study with low–middle income self-medicated their children significantly more than parents with high-income parents. Similarly, parents who have public and military insurance were more likely to practise self-medication. The public and military clinics in Jordan are often busy, crowded and not necessarily accessible. Therefore, it would be more convenient for parents to purchase antibiotic from a nearby pharmacy.^[30]

Similar to previous studies, this study suggests that community pharmacies are the main source for obtaining antibiotics and relevant information for self-medication. Despite the laws and regulations that prohibit dispensing antibiotics with a prescription in Jordan, community pharmacists disregard these regulations. This practice will eventually have negative outcomes globally due to the emergence of resistant bacteria. Therefore, the Jordanian Food and Drug Administration, ministry of health and Jordan Pharmacists

Association must join forces to enforce antibiotic regulations and find solutions for this matter.

Limitations

At the outset the of the study, it was hoped to reach a sample of 1000 respondent. This sample size was found sufficient in previous studies carried out and sought parental knowledge in Jordan.^[33,34] However, and due to time constraints as this study was part of a postgraduate thesis, a sample of 855 respondents was found enough to yield statistically significant results.

Another limitation of this study could be relying on an electronic form to collect the data which could result in a sample not representative of the country; however, it is reported that in 2015, almost 86% of the population in Jordan had internet access.^[35]

Conclusion

The findings of this study show that there is a high prevalence of parental self-medication practice of antibiotics in Jordan that should be considered as alarming problem. The lack of adequate parental knowledge about the use of antibiotics among this cohort of participants may be a major cause of the increased self-medication among them.

Also, this study has identified the main risk factors affecting parents' self-medication practice of antibiotics to their children. Parent's age, city of living, income, education level, insurance and the number of children were all predictors that may affect parents' self-medication practice. Most of the identified factors cannot be easily controlled.

In Jordan, as in many Middle East countries, antibiotics and other drugs are easily obtainable over the counter, which may contribute to the high prevalence of antibiotics self-prescription. Effective laws should be enforced to regulate access to antibiotics and prohibit parents from purchasing antibiotics over the counter. Furthermore, national publicity campaign – should be available for the general public, particularly the parents of young children, to educate them about the inappropriate use of antibiotics.

Declarations

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Authors' contributions

TLM was the primary investigator of the study and was responsible for the study design, MJK helped in the study design and results reporting, SA collected and coded the

data, ASJ carried out the tool validation and helped in preparing the manuscript, RKA analyzed the data and MBN helped in preparing and editing the manuscript.

References

1. World Health Organization. *Guidelines for the Regulatory Assessment of Medicinal Products for use in Self-Medication*. Geneva, Switzerland: World Health Organization, 2000.
2. Ruiz ME. Risks of self-medication practices. *Curr Drug Saf* 2010; 5: 315–323.
3. Bennadi D. Self-medication: a current challenge. *J Basic Clin Pharm*. 2013; 5: 19–23.
4. World Health Organization. *The Role of the Pharmacist in Self-Care and Self-Medication: Report of the 4th WHO Consultative Group on the Role of the Pharmacist*. The Hague, The Netherlands: World Health Organization, 1998.
5. World Health Organization. *Self-Care in the Context of Primary Health Care*. New Delhi, India: World Health Organization, 2009.
6. Hughes CM *et al*. Benefits and risks of self medication. *Drug Saf* 2001; 24: 1027–1037.
7. Figueiras A *et al*. Sociodemographic factors related to self-medication in Spain. *Eur J Epidemiol* 2000; 16: 19–26.
8. Alghanim S. Self-medication practice among patients in a public health care system. *East Mediterr Health J* 2011; 17: 409–416.
9. Albarrán KF, Zapata LV. Analysis and quantification of self-medication patterns of customers in community pharmacies in southern Chile. *Pharm World Sci* 2008; 30: 863–868.
10. Alhomoud F *et al*. Self-medication and self-prescription with antibiotics in the middle east—do they really happen? A systematic review of the prevalence, possible reasons, and outcomes. *Int J Infect Dis* 2017; 57: 3–12.
11. US Department of Health and Human Services. *Antibiotic Resistance Threats in the United States, 2013*. Atlanta, GA: Centers for Disease Control and Prevention, 2013; 1–113.
12. Darwish DA *et al*. Awareness of antibiotic use and antimicrobial resistance in the Iraqi community in Jordan. *J Infect Dev Ctries* 2014; 8: 616–623.
13. Shehadeh M *et al*. Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan. A pilot study. *Saudi Pharm J* 2012; 20: 125–133.
14. Sawair FA *et al*. Assessment of self-medication of antibiotics in a Jordanian population. *Med Princ Pract* 2009; 18: 21–25.
15. Al-Bakri AG *et al*. Community consumption of antibacterial drugs within the Jordanian population: sources, patterns and appropriateness. *Int J Antimicrob Agents* 2005; 26: 389–395.
16. Suaifan GA *et al*. A cross-sectional study on knowledge, attitude and behavior related to antibiotic use and resistance among medical and non-medical university students in Jordan. *Afr J Pharm Pharmacol* 2012; 6: 763–770.
17. Al-Azzam S *et al*. Self-medication with antibiotics in Jordanian population. *Int J Occup Med Environ Health*. 2007; 20: 373–380.
18. Morgan DJ *et al*. Non-prescription antimicrobial use worldwide: a systematic review. *Lancet Infect Dis* 2011; 11: 692–701.
19. Solangi MA *et al*. Parent-based self-medication in Pakistani children: a qualitative cross-sectional survey. *Bangladesh J Med Sci* 2016; 15: 33–38.
20. Mohanna M. Self-medication with antibiotic in children in sana'a city, yemen. *Oman Med J* 2010; 25: 41–43.
21. Yu M *et al*. Knowledge, attitudes, and practices of parents in rural china on the use of antibiotics in children: a cross-sectional study. *BMC Infect Dis* 2014; 14: 112.
22. Togoobaatar G *et al*. Survey of non-prescribed use of antibiotics for children in an urban community in Mongolia. *Bull World Health Organ* 2010; 88: 930–936.
23. Sa'ed HZ *et al*. Parental knowledge, attitudes and practices regarding antibiotic use for acute upper respiratory tract infections in children: a cross-sectional study in palestine. *BMC Pediatr* 2015; 15: 176.
24. Vaz LE *et al*. Prevalence of parental misconceptions about antibiotic use. *Pediatrics* 2015; 136: 221–231.
25. You J *et al*. Public knowledge, attitudes and behavior on antibiotic use: a telephone survey in Hong Kong. *Infection* 2008; 36: 153–157.
26. Ivanovska V *et al*. Change in parental knowledge, attitudes and practice of antibiotic use after a national intervention programme. *Eur J Public Health* 2018; 28: 724–729.
27. Aleem MA *et al*. Determinants of antibiotics misuse by the parents in children: a survey from northern region of Saudi Arabia. *Bangladesh J Child Health* 2016; 40: 64–71.
28. Chan GC, Tang SF. Parental knowledge, attitudes and antibiotic use for acute upper respiratory tract infection in children attending a primary health-care clinic in Malaysia. *Singapore Med J* 2006; 47: 266–270.
29. Almaaytah A *et al*. Dispensing of non-prescribed antibiotics in Jordan. *Patient Prefer Adherence* 2015; 9: 1389–1395.
30. Mukattash TL *et al*. Parental self-treatment of their children in Jordan, a qualitative study. *J Pharm Health Serv Res* 2019; 10: 317–323.
31. Suleman S *et al*. Assessment of self-medication practices in Assendabo town, Jimma zone, Southwestern Ethiopia. *Res Social Adm Pharm* 2009; 5: 76–81.
32. Eldalo AS. Saudi parent's attitude and practice about self-medicating their children. *Arch Pharm Pract* 2013; 4: 57.
33. Mukattash TL *et al*. Public knowledge and awareness of cardiovascular disease and its risk factors: a cross-sectional study of 1000 Jordanians. *Int J Pharm Pract* 2012; 20: 367–376.
34. Masadeh MM *et al*. Public awareness regarding children vaccination in Jordan. *Hum Vaccin Immunother* 2014; 10: 1762–1766.
35. Alnsour M *et al*. The perceived risks affecting online shopping adoption in Jordan. *Int J Online Mark* 2019; 9: 1–12.