Original Article

Rational Use of Medicines in Primary School Children in Turkey: Attitudes and Behaviors of Parents

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Abstract

Background: Children are dependent on their parents for medication administration. Parents' attitudes and behaviors toward the use of medicine affect their children's diseases and treatment processes. This study aimed to determine parental attitudes and behaviors toward the rational use of medicines in primary school children.
Methods: It was conducted at a primary school located in XX between September and November 2018. The study sample included parents of 371. Study data were collected using a Sociodemographic Information Form and the Rational Use of Medicine Questionnaire.
Results: Of the parents, 44.5% used non-prescription medications when their children became sick. Based on the parents' education levels, there were statistically significant differences among parents' status of reading the package insert of the medicine, checking the expiration dates of the medicine stored at home, increasing or reducing the medication dosage provided by a physician without consulting them, and using antibiotics without prescriptions.
Conclusions: The parents were found to exhibit irrational behavior in the use of medicines with their children. Therefore, parents should be provided with educational training about rational medication usage in primary health care organizations. It is also recommended to provide health education for parents on rational drug use.

Keywords: parents, child, rational use of medicine

Introduction

Medicine plays a significant role in individual and community health because it alleviates detrimental issues threatening life and health when used properly and rationally, however it may have unfavorable effects when used improperly (Ciftci & Aksoy, 2017; Pavyde et al., 2015; Yu et al., 2014). The rational use of medicine is a primary component of treatment in achieving expected therapeutic benefits (Akici et al., 2017). However, many mistakes regarding medication use such as inappropriate prescriptions, self-medication, improper dosage or incorrect method of administration, multiple medication use, unnecessary and over usage, and particularly antibiotic misuse are seen today (Alili-Idrizi et al., 2014; Aydin & Gelal, 2012; Donmez et al., 2018; Sagir & Parlakpinar, 2014; Yu et al., 2014). As a result, bacterial resistance has been developing against antibiotics and the number of ineffective treatments increasing. Adverse drug reactions

which result in disease recurrence or longer disease process has been occurring, and an economic burden has been placed on society and the patient (Ciftci & Aksoy, 2017).

The World Health Organization (WHO) has suggested the rational use of medicines to resolve this issue. The WHO defines the rational use of medicines as "people's receiving medication appropriate to their clinical findings and individual characteristics in appropriate periods and doses, and at the lowest cost to them" (World Health Organization, 1985). This has called attention to various programs and projects to popularize the rational use of medicines globally. WHO has made suggestions to countries (WHO, 2002) including establishing an institution that will control medicine use policies, creating lists of commonly used medications, creating guidelines, attaching importance to continuing education (postgraduate), educating society on the use of medicines and controlling medicine expenses (WHO, 2002). The Turkish Medicines and Medical Devices Agency, Department of Rational Use of Medicines affiliated with the Ministry of Health, Republic of Turkey was established in 2010, and the department has been carrying out several activities throughout the country. However, irrational use of medicines continues to be an important health issue today (Aksoy et al., 2015; Barutcu et al., 2017; Catakli et al., 2012). Children are one of the most sensitive groups affected by this problem.

Children are dependent on their parents for medicine when they become sick. Parental attitudes and behaviors toward medicine may positively or negatively affect the disease and theC treatment process. Attitudes have a strong effect that directs behaviors, and determination of attitudes makes it easier to predict future behaviors (Barli, 2007). No previous studies have been found determining parental attitudes and behaviors toward the rational use of medicines in Turkey. This study aimed to determine these attitudes and behaviors toward the rational use of medicines in primary school children. This study may be a guide for providing education to parents to improve their attitudes and behaviors toward the rational use of medicines and helping them acquire positive attitudes and proper behaviors regarding this use.

Methods

This descriptive study was conducted at a primary school in the city center of Ankara, Turkey between September and November 2018. The study population included parents of 1700 students who studied at a primary school. Parents were selected using the stratified random sampling method. Sample size was determined to be at least 371 using "The Sample Size Formula with Known Population". Strata were determined to be the first, second, third and fourth grades based on the grades where the students studied. The stratified random sampling operations carried out in the study were calculated using "(Stratum name/Stratum weight) x Sample Size" operation. The number of parents included in the sample was determined based on the number of students in the strata and in accordance with the strata size (95 parents from the first grade, 105 parents from the second grade, 98 parents from the third grade, and 73 parents from the fourth grade). The parents in the strata were selected using simple random sampling. As a result of the stratified sampling, the study sample included 371 parents. Data were collected by the researchers from the parents in the schoolyard while the parents were dropping off their children or picking them up from school.

Study data were collected using a Socio-demographic Information Form prepared by the researchers in accordance with the literature and the Rational Use of Medicine Questionnaire. The Sociodemographic Information Form included questions about the parents' age, gender, education level and social security status. The Rational Use of Medicine Questionnaire included 16 questions prepared by the researchers in accordance with the literature to determine the parents' attitudes and behaviors toward the rational use of medicines.

Data were analyzed using the SPSS 15 software package. The descriptive data were shown as frequency and percentage. Variables were compared to determine parents' age, gender, education level, social security enrollment and the status of the rational use of medicines using the chi-square and Fisher Exact tests. Statistical significance was accepted to be $p < 0.05$. The Ethics Committee of the University Rectorate gave ethical approval and institutional permission (dated

07/16/2018 and numbered 50273). Informed consent was obtained from the parents.

Results

Table 1 shows the sociodemographic characteristics of the parents included in the study.

Table 2 shows the distribution of the parents' attitudes for the rational use of medicines for their children. According to Table 2, 74.7% of the parents took their children to the hospital when they became sick, and 44.5% of them treated their children with medicine available in the home. Of the parents, 61.2% reported that remaining prescription medication from prior treatment should be stored to use again when needed.

Table 3 includes findings for the parents' status of rational use of medicines. Only 44.5% of the parents who participated in the study reported they used the medicine left from the previous treatments of their child, and 28.8% stated they were not given adequate information about how to use the prescription written for their child.

Table 1: Sociodemographic characteristics of the parents *(N: 371)*

Sociodemographic	characteristics	Number (n)	Percentage (%)
Age	Young Adult (Ages 20-29)	43	11.6
	Middle Age (Ages 30-59)	328	88.4
	(min.-max.:23-58)		
	(Mean: 36.92 ±6.66)		
Gender	Female	309	83.3
	Male	62	16.7
Education	Nongraduate of primary education	14	3.8
	Primary education graduate	97	26.1
	High school graduate	158	42.6
	Bachelor's or higher degree	102	27.5
Social security	Enrolled in social security	333	89.8
	Not enrolled in social security	38	10.2

Table 2: Parents' attitudes toward rational use of medicines *(N:371)*

Attitudes toward rational use of medicines		Number (n)	Percentage (%)
1. What do you do when your child becomes sick?*			
Appropriate attitude	I take my child to our family physician.	230	62
	I go to the hospital.	277	74.7
	I consult a nurse, health officer or health care personnel.	22	5.9
	I consult our pharmacist.	21	5.7
Inappropriate attitude	I consult my family/friends.	13	3.5
	I treat my child with alternative methods.	78	21
	I try to treat with medicine available at home.	165	44.5
	I ask someone whose child has suffered from a similar disease before.	7	1.9
2. What do you do with medicine left from previous treatments?*			
I store them to use when needed.		227	61.2
I throw them in the bin.		163	43.9
I give them to a person in need.		20	5.4
I give them to the pharmacy.		13	3.5
I give them to a health care organization.		48	12.9
3. Which one of the following medicine groups do you use for your child without prescriptions?*			
Painkillers		228	61.5
Antipyretics		303	81.7

Antibiotics	30	8.1
Vitamin	94	25.3
4. How do you use the medicine prescribed by a physician?*		
In accordance with the schedule and dose recommended by the physician.	352	94.9
I stop using the medicine when my child's complaints end.	43	11.6
If the complaints of my child do not end, I buy the same medicine and continue to use it.	4	1.1
5. Where should medications be stored during use?*		
In the refrigerator	216	58.2
In the freezer / deep freezer	2	0.5
At room temperature, in a cool and dry place	224	60.4
6. From whom/where would you like to obtain information regarding the medicine prescribed for your child?*		
Physician	329	88.7
Pharmacist	175	47.2
Nurse	29	7.8
Allied health personnel (midwife, health officer, etc.)	13	3.5
The prospectus of the medicine	248	66.8
Internet	73	19.7

**More than one answer was given for all questions.*

Table 3: Parents' behaviors in rational use of medicines *(N:371)*

Parents' behaviors in rational use of medicines	**Number (n)**	**Percentage (%)**
1. Do you read prospectuses/package inserts of medications?		
Yes	346	93.3
No	25	6.7
2. Do you use medicine left from previous treatments when your child becomes sick?		
Yes	165	44.5
No	206	55.5
3. Do you check the expiration dates of medicine stored in your house?		
Yes	359	96.8
No	12	3.2
4. Have you ever increased or decreased the medication dosage given by your physician without consulting them?		
Yes	21	5.7
No	350	94.3
5. Do you pay attention to whether the medicine you give your child interacts with food?		
Yes	276	74.4
No	95	25.6
6. Do you pay attention to whether the medicine you give your child interacts with other medications?		
Yes	305	82.2
No	66	17.8
7. While visiting a physician, do you inform them about the medications your child used before and the reports of your child's chronic diseases, if any?		
Yes	352	94.9
No	19	5.1

8. If your child has food or drug allergy, do you inform the physician and the relevant health care personnel during examination?		
Yes	355	95.7
No	16	4.3
9. Do you think adequate information is given about the use of the prescription written for your child?		
Yes	264	71.2
No	107	28.8
10. If your child complains of the flu, sniffles, cold, etc., do you use medicine on your own without having them examined?		
Yes	30	8.1
No	341	91.9

Table 4: Distribution of parents' behaviors of rational use of medicines by the sociodemographic characteristics *(N:371)*

Behaviors of rational use of medicines	GENDER		AGE		EDUCATION				SOCIAL SECURITY	
	Female	Male	Young Adult	Middle Adult	Nongraduate of Primary Education	Primary education graduate	High school graduate	Bachelor's or a Higher Degree	Enrolled in social security	Not enrolled in social security
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
1. Do you read prospectuses/package inserts of medications?										
Yes	288(83.2)	58(16.8)	41(11.8)	305(88.2)	9(2.6)	83(24.0)	154(44.5)	100(28.9)	312(90.2)	34(9.8)
No	21(84.0)	4(16.0)	2(8.0)	23(92.0)	5(20.0)	14(56.0)	4(16.0)	2(8.0)	21(84.0)	4(16.0)
	X^2:0.010* p: 1.000		X^2:0.337* p:0.753			X^2: 27.846* p:0.000			X^2:0.967* p:0.306	
2. Do you use medicine left from previous treatments when your child becomes sick?										
Yes	137(83.0)	28(17.0)	23(13.9)	142(86.1)	5(3.0) 9(4.4)	42(25.5)	67(40.6)	51(30.9)	146(88.5)	19(11.5)
No	172(83.5)	34(16.5)	20(9.7)	186(90.3)		55(26.7)	91(44.2)	51(24.8)	187(90.8)	19(9.2)
	X^2: 0.014 p: 1.000		X^2: 1.600 p:0.253			X^2:2.024 p:0.567			X^2:0.523 p: 0.494	
3. Do you check the expiration dates of medicine stored in your house?										
Yes	297(82.7)	62(17.3)	40(11.1)	319(88.9)	11(3.1)	92(25.6)	156(43.5)	100(27.9)	324(90.3)	35(9.7)
No	12(100.0)	0(0.0)	3(25.0)	9(75.0)	3(25.0)	5(41.7)	2(16.7)	2(16.7)	9(75.0)	3(25.0)
	X^2: 2.488* p: 0.230		X^2: 2.176* p:0.152			X^2: 11.846* p:0.004			X^2:2.938* p:0.114	
4. Have you ever increased or decreased the medication dosage given by your physician without consulting them?										
Yes	20(95.2)	1(4.8)	2(9.5)	19(90.5)	1(4.8)	13(61.9)	5(23.8)	2(9.5)	17(81.0)	4(19.0)
No	289(82.6)	61(17.4)	41(11.7)	309(88.3)	13(3.7)	84(24.0)	153(43.7)	100(28.6)	316(90.3)	34(9.7)
	X^2: 2.284* p:0.223		X^2: 0.093* p: 1.000			X^2: 13.407* p:0.003			X^2:1.877* p:0.253	
5. Do you pay attention to whether the medicine you give your child interacts with food?										
Yes	230(83.3)	46(16.7)	30(10.9)	246(89.1)	8(2.9) 6(6.3)	69(25.0)	122(44.2)	77(27.9)	250(90.6)	26(9.4)
No	79(83.2)	16(16.8)	13(13.7)	82(86.3)		28(29.5)	36(37.9)	25(26.3)	83(87.4)	12(12.6)
	X^2: 0.002 p: 1,000		X^2: 0.546 p:0.460			X^2: 3.453 p: 0.327			X^2:0.793 p: 0.432	

6. Do you pay attention to whether the medicine you give your child interacts with other medications?										
Yes	251(82.3)	54(17.7)	35(11.5)	270(88.5)	9(3.0) 5(7.6)	77(25.2)	129(42.3)	90(29.5)	278(91.1)	27(8.9)
No	58(87.9)	8(12.1)	8(12.1)	58(87.9)		20(30.3)	29(43.9)	12(18.2)	55(83.3)	11(16.7)
	X^2: 1.215 p:0.270		X^2: 0.022 p:0.882			X^2: 6.173 p:0.104			X^2:3.604 p: 0.072	
7. While visiting a physician, do you inform them about the medications your child used before and the reports of your child's chronic diseases, if any?										
Yes	293(83.2)	59(16.8)	39(11.1)	313(88.9)	14(4.0)	89(25.3)	148(42.0)	101(28.7)	316(89.8)	36(10.2)
No	16(84.2)	3(15.8)	4(21.1)	15(78.9)	0(0)	8(42.1)	10(52.6)	1(5.3)	17(89.5)	2(10.5)
	X^2: 0.012* p: 1.000		X^2: 1.750* p:0.256			X^2: 6.668* p:0.66			X^2:0.002* p: 1.000	
8. If your child has food or drug allergy, do you inform the physician and the relevant health care personnel during examination?										
Yes	295(83.1)	60(16.9)	40(11.3)	315(88.7)	13(3.7)	92(25.9)	151(42.5)	99(27.9)	318(89.6)	37(10.4)
No	14(87.5)	2(12.5)	3(18.8)	13 (81.2)	1(6.2)	5(31.2)	7(43.8)	3(18.8)	15(93.8)	1(6.2)
	X^2:0.213* p:0.752		X^2: 0.836* p: 0.413			X^2: 1.479* p:0.624			X^2:0.290* p:0.716	
9. Do you think adequate information is given about the use of the prescription written for your child?	217(82.2)	47(17.8)	32(12.1)	232(87.9)	8(3.0)	8(29.5)	106(40.2)	72(27.3)	239(90.5)	25(9.5)
Yes	92(86.0)	15(14.0)	11(10.3)	96(89.7)	6(5.6)	19(17.8)	52(48.6)	30(28.0)	94(87.9)	13(12.1)
No	X^2:0.783 p:0.376		X^2: 0.252 p: 0.616			X^2: 6.679 p: 0.083			X^2:0.598 p:0.441	
10. If your child complains of the flu, sniffles, cold, etc., do you use medications on your own without having them examined?										
Yes	25(83.3)	5(16.7)	1(3.3)	29(96.7)	1 (3.3)	14(46.7)	11(12.8)	4(13.3)	23(76.7)	7(23.3)
No	284(83.3)	57(16.7)	42(12.3)	299(87.7)	13(3.8)	83(24.3)	147(43.1)	98(28.7)	310(90.9)	31(9.1)
	X^2: 0.000 p: 1.000		X^2: 2.172* p:0.230			X^2: 7.342* p: 0.050			X^2:6.084 p:0.014	

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Discussion

This study examined parental attitudes and behaviors toward the rational use of medicines in primary school children and called attention to the important findings that could contribute to the rational use of medicine.

In the study, 74.7% of the parents went to hospital when their child became sick, 94.9% used the medication recommended the physician in proper doses and schedules, and 93.3% read the prospectuses of the medication. In addition to the parents who adopted proper attitudes and approaches for rational use of medicine, there were also parents who tried to treat their children with medications at home (44.5%) or alternative methods (21%) and those who used medicine and even antibiotics (8.1%) without consulting a doctor or without a prescription when their children became sick. Similar to the findings of the present study, many studies conducted in Turkey reported that individuals used medicine without medical advice (Ekenler & Kocoglu, 2016; Ilhan et al., 2014; Hatipoglu & Ozyurt, 2016; Pınar, et al., 2013), mothers gave antipyretics to their children without consulting a physician (Suluhan et al., 2016), and would reuse medicine left from the previous treatment for the current treatment of their children (Yapici et al., 2011). In a comprehensive study conducted in Turkey, nearly half of the participants were found to use medicines without consulting a physician (Ministry of Health, 2011). Previous studies reported that using medication without prescriptions leads to severe results (Alili-Idrizi et al., 2014; Ayalew, 2017; Currie et al., 2011).

Using antibiotics, in particular, without prescriptions increases the number of ineffective treatments, results in adverse drug reactions and recurrence of diseases, and lengthens the disease process (Ciftci & Aksoy, 2017). Although the non-prescribed sale of antibiotics was prohibited by the Turkish Ministry of Health, there are still individuals who are involved in irrational use of antibiotics. This might be caused by the inadequate supervision of non-prescription medication sales and the lack of user knowledge.

Proper use of medicines at the proper time and dose are important criterias of the rational use of medicine. Previous studies reported that 27-50% of parents do not use medication that is suitable for the schedule and dose recommended by the physician (Akici et al., 2017; Pinar et al., 2013; Yapici et al., 2011). In the present study, some of the parents changed the medication dose by themselves (5.7%) and stopped the medication after the symptoms of the child ended (11.6%). Using medication in accordance with the dose and schedule specified by the physician will increase the success of treatment in addition to preventing administering unused medication from previous treatments.

Parents' irrational use of medicine is thought to be caused by being inadequately informed. Of the parents who participated in the present study, 28.8% thought that they were not adequately informed about the use of medication and wanted to obtain more information from sources other than health care personnel (prospectus, Internet, etc.), which supports this issue. Suluhan et al. found that nearly half of the parents referred to sources such as family members and relatives rather than health care personnel as primary source of information regarding the use of medication (Suluhan et al, 2016). Physicians, nurses and pharmacists have the responsibility to give information regarding medication (Pavyde et al., 2015; Rational drug use guidelines for the community, 2013). A previous study found that health care professionals made significant contributions to the transfer of information about medication usage to society (Pavyde et al., 2015). Efforts by health care personnel is required to increase the rational use of medicine in society and develop practices regarding the use.

The present study implies that parents were in the habit of using medicine and antibiotics without prescriptions because most of them (61.2%) stored and 44.5% of them used the prescribed medications left from previous treatments to use them again when required. Previous studies show that storing medicines left from previous treatments to use in the future is a widely observed practice (Akici et al., 2017; Alili-Idrizi et al., 2014; Ilhan et al., 2014; Barutcu et al., 2017). Storing medication left from previous treatments at home may increase the possibility of parents' using them for their children at a future time. Therefore, it is important for physicians to prescribe medication in amounts that can be used by the patients during the relevant treatment (in the treatment dose) and inform individuals/patient relatives about the uses during

the proper time period. These results are relevant because they illustrate that parents needed to be better informed by health care personnel regarding the rational use of medicine. Additionally, medicine left from previous treatments at home may cause drug toxicity cases in children. This practice is not suitable for rational use of medicine and may put children at risk.

Therefore, parents should be informed about storing medication under proper conditions and out of reach of children or they should remove them from the home at the end of the child's treatment and dispose of them properly. Complying with the suitable storage conditions of medication plays an important role in maintaining the effectiveness and avoidance of possible adverse effects. Individuals should consult health care personnel about storing medicines and the usage of medication from previous treatments (Rational drug use guidelines for the community, 2013).

Another important issue highlighted in the present study is disposing of unused medication in the bin. Proper disposal is also included in the rational use of medicine. In this study, 43.9% of the parents disposed of medications in the bin after they used them while only 3.5% of them took them to the pharmacy. There are studies in the literature reporting that participants store unused medication or they dispose of them in the bin (Barutcu et al., 2017; Ilhan et al., 2014). Each drug must be disposed of in accordance with the specific disposal instructions in the product package insert.

The present study evaluated the rational drug use of parents according to sociodemographic characteristics (age, gender, education, social security) and found that education level was an important factor. Furthermore, previous studies support this finding (Pavyde et al., 2015; Yu et al., 2014). Although there are studies in the literature which report that mothers with lower education levels have misinformation about the adverse effects of medicine (Suluhan et al., 2016) and exhibit behaviors of irrational use such as using medication without prescriptions and improper storage of unused medicine (Barutcu et al., 2017; Yu et al., 2014), there are also studies which show that individuals with higher education levels use medications without prescriptions to a larger extent (Ayalew, 2017; Donmez et al., 2018; Nayir et al., 2016; Pinar et al., 2013; Yu et al., 2014). This study concluded that as education levels increased, the rates of reading the prospectuses and checking the expiration dates significantly increased.

Additionally, the rates of using antibiotics on their own and changing the dosage prescribed by the physicians without consulting them significantly decreased. Although education level did not affect the status of parents' using medicine left from previous treatments and paying attention to whether the medicine interacted with other medicines and foods, the parents with higher education levels exhibited more positive behaviors of using medication. Previous studies also show that individuals with higher education levels used medication more appropriately than those with lower education levels (Pavyde et al., 2015; Yu et al., 2014). This may be because parents with lower education levels may lack knowledge about searching, finding, understanding and evaluating the medical information, as opposed to those with higher education levels.

Presence of social security is one of the determinants in taking medicines (Yilmaz et al., 2011). The present study found that the parents with social security had higher rates of using medicine on their own than those who did not have social security, which implies that parents with social security can access medications more easily, and therefore they keep more medicine in their homes.

The most important limitation of the study was being monocentric. Another limitation was there is no study on the attitudes and behaviors of parents. Conducting studies that are more comprehensive with larger samples regarding this topic will contribute to the improvement of community health.

Conclusions: In conclusion, the study found that the parents had considerable number of behaviors of irrational use of medicine and the educational level of parents was highly effective in rational drug use behaviors. The public should be provided with more information about the rational use of and importance of medication. Significant responsibilities fall on physicians, nurses, dentist, pharmacist and community health personnel, regarding this issue.

Key Points: Public education programs should be organized regarding the rational use of medicine.

Public awareness should be raised regarding the rational use of medicine with mass media.

Furthermore, necessary regulations should be made regarding health policies so the attitudes and behaviors gained regarding the rational use of medicine will continue to be maintained.

Parents who have the right attitudes and behaviors about rational drug use will contribute to their children to raise conscious and healthy generations as role models.

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