

Knowledge and Awareness of Caregivers About Using Paracetamol in Children in Al-Baha Region: a Cross-sectional Study

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OBJECTIVE This study aimed to assess parents' knowledge, attitudes, and practices regarding the use of paracetamol in children.

METHODS A cross-sectional study was conducted in the in Al-Baha region. A self-administered electronic questionnaire was constructed and distributed by the research team using a simple random sampling method. The questionnaire included sections regarding the sociodemographic data, knowledge, practices and attitudes regarding pediatrics' paracetamol use. Parents or children's caregivers were targeted by the study.

RESULTS 41.9% of 1000 survey respondents reported administering paracetamol to their children. Parents reported administering paracetamol based on experience with similar symptoms in their children (27.2%). One-third of the respondents (33.3%) believes that the maximum amount to be administered in 1 time is a single dose, 58.8% are aware that overdose of paracetamol can harm the child, 60.8% had never administered adults' paracetamol to their children, 26% measure doses using a graded cup or a teaspoon, 61.3% preferred paracetamol syrup, and 56.9% store the drugs in the refrigerator. Re-administration of pediatric paracetamol, as per instructions of the manufacturer, is practiced by 40%. Physicians are the source of drug information in 48.1% of cases. Physician's prescriptions are the source of obtaining paracetamol in 51.1% of cases.

CONCLUSION A parental knowledge gap exists regarding the correct use of paracetamol for children in Al-Baha region. Educational programs should focus on the risks of overdose and the importance of following recommended dosages. Educational programs should also recommend limiting OTC dispensing of pediatric medications. Health care professionals should educate parents during clinical visits. Social media can be utilized to disseminate correct drug information. Narrowing of these gaps in parents' knowledge and practices improves safety and efficacy of paracetamol yielding better health outcomes.

ABBREVIATIONS ED, emergency department; IBM SPSS, International Business Machines Statistical Package for the Social Sciences; KSA, Kingdom of Saudi Arabia; NIS, New Israeli Shekel; OTC, over-the-counter; SAR, Saudi Riyals.

KEYWORDS Al-Baha region; parental awareness; pediatric paracetamol; OTC drugs; self-medication

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Introduction

Over-the-counter (OTC) paracetamol, also known as acetaminophen, is regularly used for children's pain relief and as an antipyretic due to its efficacy, relative safety, and availability in a range of pharmaceutical forms that includes syrups, drops, suppositories, etc. However, previous research has shown that parents frequently unintentionally give their children an incorrect amount of paracetamol.¹ In this study, we aimed to assess parents' knowledge, attitudes, and prac-

tices regarding the use of paracetamol, as well as their awareness of items containing the active ingredient. According to reports, paracetamol is the most prevalent pharmaceutical agent involved in overdoses, especially in children under age 6.² The variable dosing schedules and strengths of the various formulations of paracetamol pose a serious risk of overdose in children and infants.²

Paracetamol is commonly used for fever which is demonstrated to be a reason for anxiety among parents. Fever accounts for up to 22% of visits to emergency

departments (ED).³ Fifty percent of parents treat their child's fever with the wrong medication dosage.³ Many parents endorse simultaneous utilization of ibuprofen and paracetamol, to lower fever because they dread it excessively.³ Paracetamol poisoning can result from attempted suicide or accidental overdose in children.⁴ Accidental child poisoning in Jeddah was mostly connected with medicinal drugs, with a reported frequency of 23.3%.⁵ Parental education and understanding played a significant influence in decreasing the incidence of child poisoning.⁵ In a survey of 300 parents, most of the caregivers polled (87%) were females (mothers). Approximately half of the parents (50.9%) reported having used paracetamol as an antipyretic in children under the age of 6.⁵ One-quarter (25.4%) favored syrup forms, whereas 33.8% chose suppository dose forms. Roughly half of the caregivers (51.2%) relied mostly on medical staff for information. The average knowledge score for paracetamol was 2.1 (SD = 1.4) out of 6, with a median of 2.0 and an IQR of 1.0 to 3.01.⁶ Given the lack of existing studies related to our topic and our emphasis on Al-Baha city, our main goal is to assess the level of parental knowledge and awareness regarding the utilization of paracetamol among children in Al-Baha. It is essential to assess parental knowledge to establish whether parents are aware of the correct usage, dosages, potential side effects, and other safety precautions while their children are receiving treatment with paracetamol. This knowledge will add a new perspective to the discourse that could be beneficial to health providers, authorities, and educational programs aiming to ensure the safe administration of drugs to the pediatric populations in Al-Baha city, Saudi Arabia.

Materials and Methods

Study Design. A cross-sectional study was conducted in the Al-Baha region (including Al-Baha city and a few nearby villages). We collected data from pediatrics and primary health care centers, where parents went to vaccinate their children regularly and then focused on dates when we could obtain the needed sample. Most of the patients that come to these clinics do not have serious symptoms. Data was collected over an 8-week period from April 1, 2024 in the spring to May 31, 2024.

Inclusion and Exclusion Criteria. Al-Baha area residents who are parents or caregivers who have legal custody of children between the ages of 0 and 18 years were the target sample group for the study. Persons without children were excluded. Health care providers with children have been included to serve as internal controls.

Sample Size. The sample size was calculated by utilizing the Qualtrics calculator with a confidence level of 95%; the proposed sample size was 384.

Method for Data Collection and Instrument. A self-administered electronic questionnaire was constructed and distributed by the research team using a simple random sampling method to parents and health

care providers at the clinics. The health care providers included physicians, nurses, and pharmacists. Prior to participation, informed consent was obtained from all respondents, ensuring their voluntary agreement and understanding of the study's purpose and procedures. The survey took 8 weeks' time. The questionnaire utilized a modified validated survey from a similar study conducted in Palestine.⁷ It included 4 sections regarding the sociodemographic data, the awareness regarding paracetamol products among participants, parents' knowledge of paracetamol use, and parents' paracetamol-related practices and attitudes (see Supplemental Table).

Statistical Analysis

The relationship and incidence of the event have been assessed using the χ^2 . Analysis was performed using the software package IBM SPSS Statistics (SPSS Inc, version 25.0). Differences were considered statistically significant at $p \leq 0.05$.

Results

All those approached by the questionnaire agreed to participate in the survey after understanding of the study's purpose and procedures. Their total number was 1000 participants. The demographic characteristics of the participants in the study are shown in Table 1. The responses reported by physicians were not significantly different from the responses of the parents. Most of the respondents (45.8%) exist in the age range of 18 to 29 years.

Some health features of the children studied in the present work are shown in Table 2. 41.9% of parents and 50.8% of physician parent respondents reported administering OTC paracetamol to their children. 27.2% of the parents related this OTC use to their previous experience with similar symptoms in their children.

The dosing and administration knowledge and practices of parents are shown in Table 3. One-third of the respondents (33.3%) think that the maximum amount to be administered is a 1-time single dose (as opposed to repeated doses for persistent fever); and that the dose quantity is determined by the age of the child, 58.8% think that overdose of paracetamol can harm the child, 60.8% had never administered adult paracetamol pharmaceutical forms to their children, and approximately 26% measure doses using a graded cup or a teaspoon. The parents' medication preferences and practices are shown in Table 4. A majority (61.3%) of respondents preferred paracetamol syrup over other pharmaceutical forms for their children, 56.9% store the drugs in the refrigerator, 41.2% reported that their children refuse to take medications; 58.3% persuaded their children by encouragement and motivation to take medications. Re-administration of pediatric paracetamol is practiced by 40% of the parents according to the severity of the condition. Physicians were source of drug information

Table 1. Demographic Characteristics of the Participants in a Cross-sectional Study About Knowledge and Awareness of Parents About Using Paracetamol in Children in Al-Baha Region KSA

Item	Total Population N = 1000 n (%)	Physician n = 65 n (%)	Parent* n = 935 n (%)
Age range of the respondent (yr)			
18–29	499 (49.9)	41 (63.1)	458 (49)
30–39	193 (19.3)	9 (13.8)	184 (19.7)
40–49	234 (23.4)	13 (20)	221 (23.6)
50–59	57 (5.7)	2 (3.1)	55 (5.9)
>60	17 (1.7)	0	17 (1.8)
Education level of the respondent			
Not educated	1 (0.1)	0 (0)	1 (0.12)
Elementary	20 (2)	0 (0)	20 (2.1)
Intermediate	25 (2.5)	0 (0)	25 (2.6)
Secondary	176 (17.6)	0 (0)	176 (18.8)
University	721 (72.1)	45 (69.2)	676 (67.6)
Postgraduate degree	57 (5.7)	20 (30.8)	37 (4)
Relationship to investigated children			
Father	120 (12.0)		
Mother	328 (32.8)		
Brother	76 (7.6)		
Sister	236 (23.6)		
Grandfather	8 (0.8)		
Grandmother	12 (1.2)		
Other	220 (22.0)		
Education level of the mother			
Not educated	53 (5.3)	1 (1.5)	
Elementary	51 (5.1)	5 (7.7)	
Intermediate	67 (6.7)	4 (6.2)	
Secondary	204 (20.4)	13 (20)	
University	550 (55.0)	30 (46.2)	
Postgraduate degree	75 (7.5)	12 (18.5)	
Education level of the father			
Not educated	28 (2.8)	1 (1.5)	
Elementary	49 (4.9)	7 (10.8)	
Intermediate	76 (7.6)	6 (9.2)	
Secondary	219 (21.9)	8 (12.2)	
University	515 (51.5)	27 (41.5)	
Postgraduate degree	113 (11.3)	16 (24.6)	
Family Income per month (in SAR)			
<5K	102 (10.2)	4 (6.2)	98 (10.5)
5K–10K	277 (27.7)	20 (30.8)	257 (27.5)
10K–20K	389 (38.9)	22 (33.8)	367 (39.3)
>20K	232 (23.2)	19 (29.2)	213 (22.8)
Marital status			
Single	432 (43.2)	36 (55.4)	396 (42.4)
Divorced	46 (4.6)	5 (7.7)	41 (4.4)
Widowed	24 (2.4)	0 (0)	24 (2.6)
Married	498 (49.8)	24 (37)	474 (50.7)
No. of children			
One child	223 (22.3)	20 (31)	203 (21.7)
2–4 children	480 (48.0)	32 (49.2)	448 (52.2)
More than 4	297 (29.7)	13 (20)	284 (30.4)

SAR, Saudi Arabia Riyals

* Includes person with legal custody.

Table 2. Comparison Between Physician and Global Population (Including Physicians) Regarding Some Health Features of the Children Studied in a Cross-sectional Study About the Knowledge and Awareness of Parents About Using Paracetamol in Children in Al-Baha Region KSA

Response	Global Study Population N = 1000 n (%)	Participants Physicians n = 65 n (%)
Children visits to doctor in the past 6 mo		
None	159 (15.9)	11 (16.9)
Once	237 (23.7)	14 (21.5)
Twice	255 (25.5)	25 (38.5)
More than 2 times	222 (22.2)	13 (20)
I don't remember	127 (12.7)	2 (3.1)
Children self-treatment at home in the past 6 mo		
None	140 (14)	9 (13.8)
Once	198 (19.8)	15 (23.1)
Twice	205 (20.5)	17 (26.2)
More than 2 times	314 (31.4)	18 (27.7)
I don't remember	143 (14.3)	6 (9.2)
Administration of paracetamol to children without prescription		
No	321 (32.1)	22 (33.8)
Yes	419 (41.9)	33 (50.8)
I don't know (what paracetamol is)	260 (26)	10 (15)
Indication of paracetamol administration to children without prescription (n = 935)		
I didn't use it without prescription	377 (40.3)	20 (30.8)
Experience with similar symptoms	254 (27.2)	12 (18.5)
Expensive doctor charges	23 (2.5)	2 (3.1)
Lack of confidence in the health care system	18 (1.9)	7 (10.8)
No need to visit doctor	112 (12)	17 (26.2)
Other	151 (16.1)	7 (10.8)
Children ever been hospitalized before (Yes), n (%)	762 (76.2)	50 (76.9)

with reference to pediatric paracetamol use and dosing in 48.1% of cases; source of obtaining paracetamol itself was physicians' prescriptions in 51.1% of cases. Thirty-seven percent never share pediatric paracetamol, while 41.4% share the drug among other children of the family.

The participant's response, regarding the febrile indication of pediatric paracetamol without prescription, is shown in Figure 1. 31.2% estimated 38°C as the febrile point for administration of paracetamol to their children.

The response of participants, regarding the dosing interval of pediatric paracetamol preparations, is shown in Figure 2. 48.9% estimated the dosing interval at 4 to 6 hours.

Discussion

Socio-demographic factors, and family caregivers' psychosocial status, are among the influencing factors on parental pediatric paracetamol administration practices.⁶ The demographic characteristics of the participants in the present study has 2 merit features compared with similar previous investigations; a larger study sample (n = 1000), and a detailed description of the sample. Both contribute to the reliability of the

results. A Palestinian cross-sectional study of similar interest, that included 300 participants, reported 87% of the sample being females.¹ This is higher than our female participants of 57.6% of the study sample wherein 32.8% were mothers, 23.6% were sisters and 1.2% were grandmothers. The diversity of caregivers in the family, and the involvement of all family members in the health care of the family children, shows the strength of relationships within the local community. Most of our respondents (72.1% total, 55% of mothers and 51.5% of fathers) are university graduates. 5.7%, including 7.5% of the mothers and 11.3% of the fathers, hold postgraduate degrees. 0.1% of the respondents were non-educated, moreover, 5.3% of the mothers and 2.8% of the fathers of the children are non-educated. Considering that the sample was random and cross-sectional, these results indicate the wide dissemination of education in the local community and contribute to the reliability of the results which depends on understanding and honest questionnaire responses. The educational level of participants in our study is different from that in the Palestinian report, where 55.3% of the mothers reported completing high school education as their highest level of education. They also reported 75.3% of respondents

Table 3. Dosing and Administration Knowledge and Practices of Parents in a Cross-sectional Study About the Knowledge and Awareness of Parents About Using Paracetamol in Children in Al-Baha region KSA*

Item	Study Population Response, n (%)	
	Rectal Suppositories	5-mL Teaspoon
Maximum doses of pediatric paracetamol/day (N = 1000)		
1	333 (33.3)	427 (42.7)
2	172 (17.2)	152 (15.2)
3	69 (6.9)	69 (6.9)
4	29 (2.9)	35 (3.5)
5	9 (0.9)	17 (1.7)
I don't know	388 (38.8)	300 (30)
Pediatric paracetamol dose is determined according to (N = 1000)		
Previous experience	66 (6.6)	
Age of the child	333 (33.3)	
Weight of the child	238 (23.8)	
Severity of the condition	103 (10.3)	
Pharmaceutical manufacturer instructions	130 (13)	
Other	130 (13)	
Overdose of pediatric paracetamol can cause harm (N = 1000)		
No	94 (9.4)	
I don't know	318 (31.8)	
Yes	588 (58.8)	
Drug poisoning	137 (13.7)	
Renal injury	144 (14.4)	
Hepatic injury	130 (13)	
Immunosuppression	77 (7.7)	
Gastric upset	80 (8)	
Other	234 (23.4)	
Paracetamol syrup expiration following bottle opening (N = 1000)		
3 mo	380 (38)	
6 mo	119 (11.9)	
Until expiration date	175 (17.5)	
I don't know	326 (32.6)	
Ever administered adult paracetamol preparations to your children (N = 1000)		
No	608 (60.8)	
I don't know	232 (23.2)	
Yes	160 (16)	
Cause of administration of adult paracetamol preparations to your children (N = 407)		
More safe	66 (6.6)	
More effective	93 (9.3)	
Didn't have pediatrics form	60 (6)	
Other	188 (18.8)	
Adult dose modification done to fit your children (N = 424)		
Administration of half the adult dose	93 (9.3)	
Calculated dose	74 (7.4)	
No modification needed	96 (9.6)	
Other	161 (16.1)	
Instrument used to measure the dose (N = 831)		
Graded cup	267 (26.7)	
Syringe	195 (19.5)	
Tablespoon	100 (10)	
Teaspoon	269 (26.9)	
Other	169 (16.9)	

* Expiration date according to the respondent own thoughts.

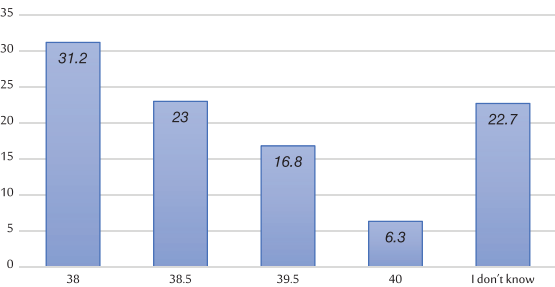
Table 4. Parents' Medication Preferences and Practices in a Cross-sectional Study About the Knowledge and Awareness of Parents About Using Paracetamol in Children in Al-Baha region KSA

Item	Study Population Response, n (%)
Preferred pediatric paracetamol dosage form (N = 1000)	
Rectal suppositories	101 (10.1)
Tablets	67 (6.7)
Syrup	613 (61.3)
Rectal suppositories or syrup	186 (18.6)
Drops	33 (3.3)
Reason for preferring paracetamol rectal suppositories (N = 482)	
Children age	94 (19.5)
Ease of administration	81 (16.8)
Effectiveness	90 (18.7)
Affordable price	27 (5.6)
Doctor's advice	54 (11.2)
Pharmacist's advice	19 (3.9)
Friends' recommendation	4 (0.8)
Other	113 (23.4)
Source of mastering suppositories administration technique (N = 457)	
Physicians' instructions	122 (26.7)
Pharmacists' instructions	41 (9)
Nurses' demonstration	68 (14.9)
Previous personal experience	123 (26.9)
Other	103 (22.5)
Storage of paracetamol rectal suppositories (N = 496)	
In the refrigerator	282 (56.9)
In the deep freezer	64 (12.9)
At room temperature	53 (1.1)
Other	97 (19.6)
Difficulties in administering paracetamol to the children (N = 1000)	
Children uncooperative because of illness	122 (12.2)
Children sleeping at dosing time	56 (5.6)
Children refuses to take medications	412 (41.2)
No difficulties	243 (24.3)
Other	167 (16.7)
Method used to convince children to take medications (N = 1000)	
Children encouragement and motivation to take medications	583 (58.3)
Children enforcement to take medications	63 (6.3)
Administration of suppositories in replacement for syrups	76 (7.6)
Mixing medications with juice or food	69 (6.9)
Mixing medications with juice or food or use of suppositories	28 (2.8)
Asking for medical counseling	31 (3.1)
Replacing medicines with non-pharmacologic methods	15 (1.5)
Other	135 (13.5)
Repeated re-administration of pediatric paracetamol depends on (N = 1000)	
Physicians' counseling/consultation	254 (25.4)
Pharmacists' recommendations	46 (4.6)
Children age	66 (6.6)
Children weight	54 (5.4)
Children severity of condition	400 (40)
Pharmaceutical manufacturer instructions	46 (4.6)
Other	134 (13.4)
Source of drug information with reference to pediatric paracetamol (N = 1000)	
Physicians	481 (48.1)
Pharmacists	144 (14.4)
Pharmaceutical manufacturer medicine leaflet	86 (8.6)
Friends and relatives	24 (2.4)
Previous experience	64 (6.4)
Personal knowledge	64 (6.4)
Other	137 (13.7)

(Table cont. on page 651)

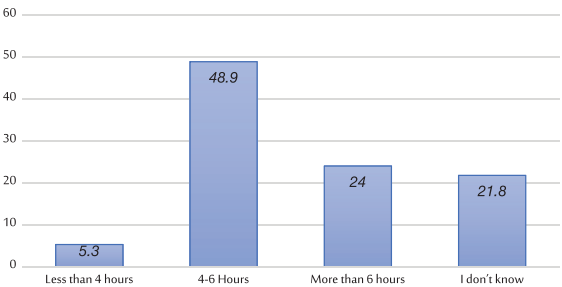
Table 4. Parents' Medication Preferences and Practices in a Cross-sectional Study About the Knowledge and Awareness of Parents About Using Paracetamol in Children in Al-Baha region KSA (cont.)	
Item	Study Population Response, n (%)
Source of getting pediatric paracetamol (N = 1000)	
Physicians' prescription	511 (51.1)
Pharmacy without prescription (over the counter)	249 (24.9)
From friends and relatives	28 (2.8)
From previously used and stored at home	43 (4.3)
Via electronic marketing suppliers	21 (2.1)
Other	148 (14.8)
Re-administration or sharing of pediatric paracetamol for similar symptoms (N = 1000)	
I don't share medicines with others	370 (37)
I share medicines between my children if they develop similar symptoms	414 (41.4)
I share medicines with my friends/relative if their children develop similar symptoms	61 (6.1)
I re-use pediatric paracetamol for the same child if it develops similar symptoms	155 (15.5)

Figure 1. The response percent, regarding the febrile indication (in Celsius degrees) of OTC pediatric paracetamol, of participants in a cross-sectional study about knowledge and awareness of parents about using paracetamol in children in Al-Baha region KSA, n = 1000.



fell into the age range of 19 to 30 years old, whereas only 49.9% of our respondents were in this age range.¹ With age, mothers are expected to collect a build-up of experience pertaining to childcare. Slightly less than half of our sample (48%) have 2 to 4 children, 22.3% have 1 child, and 29.7% have more than 4 children. These determinations are partially consistent with the previous determinations that 33.0% had 2 children below 18 years of age, and 50% had 2 children below 6 years of age.¹ It has been found that 43.2%, 4.6%, 2.4%, and 49.8% of those approached by the study are single, divorced, widowed, or married, respectively. The family monthly income was reported as less than 5K, 5 to 10K, 10 to 20K, or more than 20K SAR for 10.2%, 27.7%, 38.9%, and 23.2% of them respectively. The latter finding is higher than the findings in similar previous investigation in Palestine in which 64% of their sample has a family monthly income of 2K to 5K NIS, that is,

Figure 2. The response percent, regarding the dosing interval of pediatric paracetamol preparations, of participants in a cross-sectional study about knowledge and awareness of parents about using paracetamol in children in Al-Baha region KSA, n = 1000



2.066K to 5.165K SAR.⁷ Both the former and latter findings contribute to family stability and general child welfare including health issues. Among the children included in our sample, it has been determined that 23.7%, 25.5%, and 22.2% (total of 71.4%), have visited a doctor once, twice, or more than 2 times, respectively within the past 6 months. These results indicate that a majority of families rely on health services for their children's welfare. This percentage is greater than the previous determination that 43.7% of the children had 1 doctor visit in the last 6 months.¹ The frequency of parental treatment of children at home in the past 6 months was 23.7%, 25.5%, 22.2%, for 1 time, twice, or more than 2 times, respectively, compared with none (15.9%). Administration of paracetamol to children without prescription was at 41.9%. The justification of this drug administration was experience with similar symptoms (27.2%),

expensive doctor charges (2.5%), lack of confidence in the health care system (1.9%), and denial of the need to visit a doctor (12%). These findings are consistent with those reported by previous studies that 73.4% self-medicated their children without medical advice; that 50.7% self-medicated their children with paracetamol without medical advice; and that the reason for this administration was either having parental experience of treating their children (54.6%) or ascertaining of the child's illness from symptoms (49.2%).⁷ These findings reflect a high incidence of OTC paracetamol potentially being used incorrectly by parents which poses potential hazards to this especially vulnerable patient population. Earlier investigators had raised alarm against over-the-counter medication for pediatrics, particularly regarding parents' misinterpretations medications' labels.⁸ Indiscriminate home medication of non-specific symptoms such as fever should not be encouraged in the presence of remote health care facilities. The available access to these services is confirmed by the present finding that 76.2% of the subject children have been hospitalized before.

As it has been initially proposed, there is an awareness gap regarding paracetamol pediatric use. This is significant regarding the wide use and the ease of access to the drug. Most respondents think that the maximum dose is 1 suppository or a teaspoon-full syrup. This finding is consistent with the previous finding that 61% of the investigated community specify paracetamol dosing interval as 4 to 6 hours.¹ However, there is still a notable number of participants who either believe a shorter or longer time frame is appropriate or are unsure. Most of the respondents (56.1%) think that pediatric paracetamol dose is determined according to age or weight of the child regardless of other determinant variables such as the clinical indication. A previous study had reported similar findings (52.6%).¹ 58.8% think that overdose of pediatric paracetamol can cause harm, wherein only 13% correctly assigned that harm to hepatic injury. This result is consistent with the previous reports that 50.9% of the investigated community is aware of the potential harm of an overdose of the drug¹; that 67.4% of the investigated community believe that paracetamol self-medication is potentially lethal in overdose⁷; or that 25.8% were aware of liver damage as a side effect of paracetamol.⁹ Wherein 16% had previously administered adult paracetamol to their children, 9.3% attributed that misuse to its effectiveness compared with pediatric forms, 9.6% used the full adult dose while 9.3% gave half of the adult dose. This determination is less than a previous report where most parents believed that, for all pills, when split in half, they provide precisely half of the therapeutic dose.⁷ Of those who used a calculated dose (7.4%), only 46.2% used a graded instrument. This finding is less than the previous determination that 64% used a syringe or a graded cup to adjust

the dose of paracetamol syrup,¹ and far less than the finding that most 93.8% of the parents indicated their use of the measurement tool available in the medicine packet.⁷ Pertaining to expiration of paracetamol syrup following bottle opening, most of the respondents (38%) assigned the period of 3 months, contrary to an earlier determination of assigning this to the manufacturer expiration date on the bottle by 44% of the investigated sample.¹

The preferred pediatric paracetamol dosage form was syrup (62.3%) followed by rectal suppositories (10.1%). This finding is different from a previous report wherein suppository preference (33.8%) predominated over syrup (25.4%).¹ In an earlier study, it was determined that 33.8%, 25.4%, or 1.7% preferred suppositories, syrup, or drops, respectively.⁹ This finding may be determined by child age group, with suppositories being more commonly indicated for toddlers and infants, while syrups are more appropriate for school age children. 18.6% reported preferring, both forms equally, and only 3.3% preferred neonatal drops. Of the respondents, 19.5%, 16.8%, 11.2%, and 18.7%, owed their preference of rectal suppositories to the age of the child, ease of administration, the doctor's advice, or effectiveness, respectively. The last finding signals a gap of awareness since the different dosage forms are usually bioequivalent. A similar finding has been reported in a previous study, where 32.8% owed their preference of suppositories to its therapeutic efficacy compared with other dosage forms.¹ It is worth mentioning that the efficacy of this dosage form depends largely on mastering administration technique and the storage of suppositories. Health care instructions, or demonstration (50.6%) had been the source of mastering the technique, and 56.9% kept the medicine stored in the refrigerator. In the instances that children refused to take the medication 41.2% the predominant method used to convince the child to take the medication was encouragement and motivation to take the medicine (58.3%) among other methods. Approximately 7% of respondents reported mixing medication with juice or food which can lead to unanticipated food and/or drug interactions. Former investigators found that 26.5% revert to coaxing and encouraging the reluctant children (36.2%), compared with 24% shifting to suppositories, or 18.8% using force with the child.¹ The latter method (e.g., using force) may lead to more serious outcomes as aspiration pneumonia, physical trauma, or aggrandizement of psychological trauma. The respondents assess severity of the children's illness (40%) rather than physicians' consultation (25.4%) for repeated re-administration of pediatric paracetamol. These determinations are consistent with the previous report that 36.9% of parents relay on severity of illness rather than physicians' consultation (15.1%) for repeating paracetamol administration.¹

Among other sources, physicians are the main source of drug information with the reference to be pediatric

paracetamol (48.1%). This finding is greater than a previous finding that 33.4% identified physicians as their source of drug information.¹ Friends and relatives constitute a source for drug information to 2.4% of our respondents. However, non-medically trained friends and relatives are an unreliable source of information, compared with other sources such as the pharmaceutical manufacturer leaflet and can pose hazards to the subject children. Over-the-counter acquirement of pediatric paracetamol is common to 24.9% of our sample, together with another 2.1% obtaining the drug from electronic marketing suppliers. The findings that 51.1% of our sample get the drug after issuance of a prescription order does not ameliorate the seriousness of the situation. It is an important finding that 63% share the drug between their children, for the same child, and relatives and friends' children once they developed the same symptoms. Similar findings were reported in Palestine,⁷ Korea,¹⁰ India,¹¹ and Yemen.¹² Fever can be presenting symptom for a variety of conditions, the management of each depends slightly on the underlying cause of fever. Regarding the body temperature that indicates administration of pediatric paracetamol, the response of 77.5% of the caregivers was variable between 38°C and 40°C, while 22.5% were unsure. Similar response variations have been reported by previous Malaysian² and Italian¹³ researchers.

Limitations

Limitations of our study include the study type being a cross-sectional study which provides the least level of evidence. Interventional cohort studies may produce stronger evidence pertaining to the same research question. Our study was limited to a single local community, expanding to a greater region and expanding to additional special populations (e.g., geriatric patients) would strengthen the validity of the results. A new questionnaire must be designed and validated to include new domains. Correlation between demographic and respondent responses should have been conducted using logistic regression with a view to find any beneficial association that may aid in clarifying some issues regarding the area under investigation.

Conclusion

A gap exists in parents' knowledge regarding the rational use of paracetamol for children in Al-Baha region. In as much as paracetamol is widely used, many parents are unaware of the essential drug information. A considerable number of parents depend on non-medical sources for these information. It has been shown that while most parents use paracetamol for their children, a notable number of them do so without medical advice, or share the drug with other patients. Some parents use incorrect dosages, or are unaware of the potential harm of overdose. This shows the need for educational programs to enhance parent's knowledge and safe use

of paracetamol. Educational programs should focus on the risks of overdose and the importance of following recommended dosages. Our data suggest that the OTC dispensing of drugs should be limited until education of their safe use is expanded. Health care professionals roles are important in educating parents during clinical visits. Social media is, yet, an effective tool that can be utilized to disseminate correct drug information is received. If these gaps in parents' knowledge and practices are narrowed, the safety and efficacy of paracetamol use will be enhanced and better health outcomes will be obtained in Al-Baha region.

Article Information

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Ethical Approval and Informed Consent. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant international guidelines on human experimentation and have been approved by the appropriate committees at our institution (Al-Baha University Faculty of Medicine; No. REC/PHA/BU-FM/2024/37).

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