Original Article

Evaluation of Parental Awareness and Knowledge Regarding the Use of Antibiotics for Respiratory Infections in Children: A Cross-Sectional Study

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Abstract

Background: Physicians often treat children with upper respiratory tract infections at primary healthcare facilities. Viruses are the primary cause of most upper respiratory tract infections, but the lack of information among parents often contributes significantly to antibiotic misuse. This misuse, in turn, leads to the emergence and spread of antimicrobial resistance. **Objectives:** To assess the parents' knowledge and awareness of antibiotic use for children's respiratory infections in holy Karbala city. **Materials and Methods:** An observational study was conducted at primary healthcare centers and private clinics in the city of Karbala from August to December 2023. A structured questionnaire was developed and distributed to assess parents' awareness and knowledge regarding the utilization of antibiotics to treat children's respiratory illnesses. **Results:** A total of 250 parents completed the questionnaire. The knowledge-weighted mean was calculated to be 3.13 ± 0.637, indicating a "neutral" response on the Likert scale. The weighted mean for the awareness component was calculated to be 3.93 ± 0.717, suggesting that the participants' response was "agree.." About 32.8% of participants agreed to administer antibiotics to their child with fever, whereas 49.2% felt that drugs could effectively treat viral illnesses. **Conclusion:** Although this study demonstrated a broad level of awareness, it revealed that parents have a limited understanding of the appropriate usage of antibiotics for children's respiratory illnesses.

Keywords: Antibiotics, knowledge, parents awareness, upper respiratory tract infections

Introduction

The upper respiratory tract infections (URTIs) are the most frequent type of illness in children, affecting around six to eight preschool-aged children each year on average.[1] Lower respiratory tract infections (LRTIs) refer to a collection of infections that affect the respiratory tract below the larynx. The LRTIs are the primary reason for hospitalization in pediatric patients.[2] Antibiotics are naturally occurring compounds produced by microorganisms, such as bacteria or fungi, that have the ability to impede the growth of other microbes and cause damage to their cells.[3] Antibiotics are not advised for people with coughs, colds, and viral sore throats. Nevertheless, in a recent assessment on the prescription of antibiotics in UK general practice, it was found that 50% of patients who sought medical advice for these diseases were prescribed antibiotics.[4] Critical care unit (ICU) and other hospital ward patients are particularly vulnerable to the effects of antibiotic resistance, which is a global health concern. A rise in antibiotic resistance has been linked to the abuse of antibiotics. Antibiotic-resistant bacteria were recognized over 50 years ago. Most *Staphylococcus aureus* isolates have become resistant to past penicillin treatments.[5-7] Every year, the European Centre for Disease Prevention and Control estimates that 25,000 individuals in Europe lose their

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lives as a direct consequence of infections that are resistant to treatment.[8] Antibiotic use and resistance reduction depend on the public awareness. A significant factor in the overprescription of antibiotics for infections, nevertheless, is the pressure on clinicians to satisfy patient expectations.[9] Preventing inappropriate antibiotic utilization in both primary and secondary healthcare settings represents only a small part of the overall solution.[4] As a result, parents' knowledge, actions, and attitudes regarding the use of antibiotics in the treatment of various diseases in children are extremely important.[10] There is a correlation between children's improper antibiotic consumption, doctors prescribing too many antibiotics, parents not knowing enough about how to use them, and the ease with which children can self-medicate.[11] The purpose of this research was to find out how well parents comprehend the need for antibiotic treatment for children who have URTIs.

Materials and Methods

A cross-sectional study was carried out on a sample of 250 parents who went to Holy Karbala's primary healthcare facilities and outpatient clinics. The study was carried out in 2023, specifically from August to December. To obtain a representative sample of parents, the primary healthcare centers and outpatient settings were chosen using regional clustering sampling. Three components make up the finished study instrument:

1. The sociodemographic characteristics sheet consists of seven elements, namely, gender, age, residency, level of education, income level of household per month, number of children, and the number of antibiotics used in the last year.
2. Parents' understanding of antibiotic usage in children's respiratory illnesses was assessed using eight items based on a prior study.[12] The questions were organized in a manner that facilitated easy management. The symbol A was assigned to represent the knowledge section, and the sequential questions were labeled from A1 to A8 [Table 1].
3. Parents' antibiotic awareness for children's respiratory illnesses comprised three elements based on previous research.[12] The questions were organized in a manner that facilitated their management. The symbol "B" was assigned to the third part, and the questions within this part were sequentially labeled as B1, B2, and B3 [Table 2].

Scoring of parents' knowledge and awareness

The study employed Likert scales, a regularly used tool in medical education research. The construction of a Likert (or Likert-type) scale is directed by the aims of the investigation. During the process of analysis, the scores obtained from all the items on the questionnaire are combined together, usually by adding them up, in order to generate a composite score. A 5-point Likert

Table 1: Parents' knowledge questions

No	Knowledge question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
A1	Antibiotics are suitable for any child experiencing a fever					
A2	Antibiotics are effective in treating upper respiratory tract infections caused by viral pathogens.					
A3	Children with flu-like symptoms recover faster with antibiotics.					
A4	Administering prophylactic antibiotics to children can effectively minimize the occurrence of colds.					
A5	Antibiotics are devoid of any adverse effects.					
A6	As the cost of antibiotics increases, its impact also increases.					
A7	Inappropriate antibiotic use does not reduce the therapeutic efficacy or enhance bacterial resistance.					
A8	Researchers can always develop antibiotics for resistant microorganisms.					

Table 2: Parents' awareness questions

No	Awareness questions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
B1	In my opinion, there is an over reliance on antibiotics					
B2	I think pediatricians and parents should learn antibiotic use					
B3	I did not exert any influence on your pediatrician to prescribe antibiotics					

Table 3: Sociodemographic characteristics

Variables		Number	%
Gender	Male	23	9.2
	Female	227	90.8
Residency	City	182	72.8
	Rural	68	27.2
Age category	19–30	116	46.4
	31–40	98	39.2
	41–50	34	13.6
	51–60	2	0.8
Father education	Illiteracy	7	2.8
	Primary	35	14.0
	Secondary	25	10.0
	High school	22	8.8
	Institute	29	11.6
	Bachelor	101	40.4
	High degree	31	12.4
Mother education	Illiteracy	8	3.2
	Primary	27	10.8
	Secondary	23	9.2
	High school	27	10.8
	Institute	32	12.8
	Bachelor	124	49.6
	High degree	9	3.6
Income	Low	25	10.0
	Middle	151	60.4
	Good	73	29.2
Drug usage	No	12	4.8
	Once	23	9.2
	Twice	65	26.0
	Thrice	60	24.0
	More than four	89	35.6

scale spanning from "strongly agree" to "strongly disagree" was used as it is highly recommended by researchers for reducing patient irritation and improving the response rate and quality.[13] The Likert scale used in this study is a 5-point scale, with scores ranging from 1 to 5. Higher scores on the scale indicate more positive findings, with 5 being the best conceivable outcome and 1 representing the least desired outcome. Individuals who obtained scores above the median were evaluated as having "superior knowledge and awareness." This study was approved by the Scientific and Ethical Committee of College of Pharmacy, University of Kerbala (No: 2023HU16 on November 30, 2023), which meets the requirements of Helsinki Declaration.

Statistical analysis

The collected data from participant questioners were analyzed by using SPSS version 26. Tables and graphs showed frequencies and percentages or mean and standard deviation. ANOVA, independent *t* test, and *post hoc* analysis were employed to see if LSD was associated with research variables. Additionally, a Likert-scale statistical analysis assessed the power of all study axes. A significant statistical relationship was defined as a *P* value of 0.05 or less.

Results

Table 3 showed that the majority (90.8%) of the study sample consisted of females. The educational level of both fathers and mothers was a bachelor, with 40% and 49%, respectively. Furthermore, approximately 60.4% of the study sample had a modest income, while 35.6% of the study sample reported using drugs more than four times in the last year.

The data shown in Table 4 indicate that the majority of parents exhibited insufficient understanding of the use of antibiotics in children with respiratory infections, with the exception of items A4, A5, and A7. The top-ranked question in this section was A5, which had a mean score of 3.78.

Table 5 showed that 43.6% of parents thought antibiotics were overused, 56.8% thought parents and pediatricians

Table 4: Parents' response to questions related to knowledge

Question		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	SD	Rank
A1	N	6	82	57	83	22	3.13	1.046	4
	%	2.4	32.8	22.8	33.2	8.8			
A2	N	10	123	33	62	22	2.85	1.111	6
	%	4.0	49.2	13.2	24.8	8.8			
A3	N	17	119	49	53	12	2.70	1.031	7
	%	7.7	48.1	18.3	21.2	4.8			
A4	N	7	41	29	122	51	3.68	1.062	2
	%	2.8	16.4	11.6	48.8	20.4			
A5	N	3	41	26	119	61	3.78	1.033	1
	%	1.2	16.4	10.4	47.6	24.4			
A6	N	19	77	60	72	22	3.00	1.121	5
	%	7.6	30.8	24.0	28.8	8.8			
A7	N	12	54	20	101	63	3.60	1.213	3
	%	4.8	21.6	8.0	40.4	25.2			
A8	N	35	132	48	29	6	2.36	0.943	8
	%	14.0	52.8	19.2	11.6	2.4			
Weighted mean ± SD							3.13	0.637	

Table 5: Parents' response to questions related to awareness

Question		Strongly disagree	Disagree	neutral	Agree	Strongly agree	Mean	SD	Rank
B1	N	14	66	27	109	34	33.3	1.168	3
	%	5.6	26.4	10.8	43.6	13.6			
B2	N	4	3	4	97	142	4.48	0.740	1
	%	1.6	1.2	1.6	38.8	56.8			
B3	N	10	30	13	99	98	3.98	1.135	2
	%	4.0	12.0	5.2	39.6	39.2			
Weighted mean ± SD							**3.93**	**0.717**	

Table 6: Association between age category and level of knowledge and awareness

Parameters	Age category				Pairwise comparison	P value
	19–30 N (116)	31–40 *N* (98)	41–50 *N* (34)	51–60 *N* (2)		
*A mean	3.14 ± 0.576	3.19 ± 0.706	2.92 ± 0.617	3.00 ± 0.176	31–40 vs 41–50	0.034 S
**B mean	3.87 ± 0.733	4.03 ± 0.686	3.86 ± 0.743	3.33 ± 0.00		0.216 NS

* A mean (weighted means of knowledge)

**B mean (weighted means of awareness).One-way ANOVA test was used with a significant *P* value of less than 0.05. Results are presented as mean ± SD, [S]= significant, [NS]= non-significant

should be educated about antibiotic use, and 39.6% did not pressure their pediatrician to prescribe antibiotics. B2 had the best question in this part with a mean of 4.48.

The data presented in Table 6 indicated that parents in the age range of 31–40, with a mean knowledge score of 3.19 ± 0.706, had a greater level of knowledge compared to parents in the age range of 41–50, with a mean knowledge score of 2.92 ± 0.617. The statistical analysis revealed a significant difference between the two groups, with a *P* value of 0.034.

Table 7 indicated that city-dwelling parents had better knowledge scores (3.20 ± 0.671) compared to rural parents (2.95 ± 4.96). Comparison of *P* value (0.002 S). Parents in cities had higher awareness scores (4.09 ± 0.644) compared to those in rural areas (3.49 ± 0.725). Comparison of *P* value (0.001 S).

Table 8 shows that fathers with high degrees (E7) had a higher knowledge score (3.53 ± 0.653) compared to illiteracy (2.67 ± 0.321). Fathers with a bachelor's degree (E6) scored higher on knowledge (3.21 ± 0.638) than those with illiteracy (E1) (2.83 ± 0.593) (*P* = 0.026). Fathers with bachelor's degrees (E6) had greater awareness scores than those with illiteracy (E1), primary degrees (E2), secondary degrees (E3), and institutes (E5) (*P* = 0.001). High school fathers (E4) had a higher awareness score (3.87 ± 0.807) than illiterate fathers (E1) (3.00 ± 0.720) (*P* = 0.003).

Table 7: Association between residency and level of knowledge and awareness

Variable	Residency	Mean	SD	T value	P value
A mean	City (182)	3.20	0.671	3.168	0.002 S
	Rural (68)	2.95	0.496		
B mean	City	4.09	0.644	5.979	0.001 S
	Rural	3.49	0,725		

* A mean (weighted means of knowledge)

*B mean (weighted means of awareness). Independent *t* test was used with a significant *P* value of less than 0.05. Results are presented as mean ± SD, [S]= significant, [NS]= non-significant.

Table 8: Association between education and level of knowledge and awareness

Parameter	Education								*P* value
	Illiteracy 7	Primary 35	Secondary 25	High school 22	Institute 29	BC 101	HD 31		
A mean	2.67 ± 0.321	2.83 ± 0.593	3.08 ± 0.716	2.92 ± 0.550	3.12 ± 0.450	3.21 ± 0.638	3.53 ± 0.635	E7vsE1	0.001
								E7vsE2	0.001
								E7vsE3	0.006
								E7vsE4	0.001
								E7vsE5	0.009
								E7vsE6	0.010
								E6vsE1	0.026
								E6vsE2	0.002
								E6vsE4	0.044
B mean	3.00 ± 0.720	3.73 ± 0.735	3.73 ± 0.844	3.87 ± 0.807	3.70 ± 0.783	4.10 ± 0.585	4.19 ± 0.549	E7vsE1	0.001
								E7vsE2	0.007
								E7vsE3	0.013
								E7vsE5	0.006
								E6vsE1	0.001
								E6vsE2	0.005
								E6vsE3	0.014
								E6vsE5	0.005
								E2vsE1	0.010
								E3vsE1	0.012
								E4vsE1	0.003
								E5vsE1	0.015

* E1 (Illiteracy), E2 (primary), E3 (secondary), E4 (high school), E5 (institute), E6 (Bachelor), and E7 (high degree).

*A mean (weighted means of knowledge)

*B mean (weighted means of awareness). One-way ANOVA test was used with a significant *P* value of less than 0.05. Results are resented as mean ± SD, [S]= significant, [NS]= nonsignificant

Discussion

The results of the present investigation revealed that 90.8% of the participants in the study were female. This phenomenon can be attributed to the fact that women typically demonstrate greater solicitude for the well-being of their offspring in comparison to males. The findings are consistent with those of prior research, which indicated that 62.6% and 92.6% of the study sample were males and females, respectively.[14,15] Zyoud *et al*. and Albayrak *et al*. found that 62.1% and 90.3%, respectively, of the study sample lived in urban regions; this result is similar to that observed by majority of parents in the present study (72.8%).[12,14] Another research indicated that the vast majority of respondents (82.3%) resided in metropolitan areas.[16]

In terms of the age distribution, the largest proportion of participants were between the ages of 19 and 30, accounting for 46.5% of the total. The second largest group came within the 31–40 age range, making up 39.2% of the participants; this findings align with those of the study conducted by Saleh Faidah *et al*. (2019) in Makkah, which reported that around 75.6% of the participants were between the ages of 19 and 30, while 16.1% of the participants were between the ages of 31 and 40.[15] Another study indicated that the age of the respondents was within the range of 31 to 40 years, totaling 174 individuals (43.0%).[17]

Regarding educational achievement, 49% of the study sample's mothers held a bachelor's degree, while 40% of the fathers had the same level of education. The distribution of data was largely attributed to the diverse educational backgrounds present in the primary healthcare centers from which the data were gathered. These findings align with the results of a prior investigation.[18,19] A majority (60.4%) of parents perceived their income as moderate, which aligns with Saleh Faidah *et al*. findings.[15]

However, there was a discrepancy in the frequency of antibiotic usage, with 35.6% of parents reporting using antibiotics more than four times in the last year. This greater consumption may be due to the lack of a national action plan or antibiotic prescription supervisor. In contrast, Albayrak *et al*. (2021) found that 46.4% of Turkish parents did not take antibiotics in the last year.[12] The current study highlights that a significant portion of participants' parents lacks adequate knowledge regarding the use of antibiotics to treat children's respiratory infections. This finding aligns with the results of previous studies in which less than half of the parents reported adequate knowledge regarding the administration of antibiotics for a viral infection as this illness is self-limited.[20,21] In Ethiopia, parental understanding of antibiotic use in children with URTIs was low.[22]In the knowledge section, 49.2% of parents agreed that "antibiotics can cure viral URTIs." As in prior studies, 50% of individuals believe that antibiotics can treat most URTIs.[23]

In comparable research, most respondents thought antibiotics were necessary for the issues listed.[24] This is likely due to parents not differentiating between bacterial and viral infections, as well as not recognizing that viral infections sometimes resolved spontaneously. This study revealed that most of the participants' parents have an adequate level of knowledge about the appropriate use of antibiotics for respiratory illnesses in children. This finding was in line with those of previous studies conducted by Alrafiaah *et al*. in Saudi Arabia[25] and Teck *et al*. In Kuala Lumpur, Malaysia,[19] nonetheless, the results contradict the findings of Zyoud *et al*. in a study conducted in Palestine.[14] A minor fraction (4%) of parents applied pressure on physicians to prescribe antibiotics, demonstrating a substantial level of confidence in their pediatrician's expertise. The study found that individuals in the age range of 31–40 had a knowledge score of 3.19 ± 0.706, which was greater than the scores of individuals in other age categories. This result aligns with those of the research conducted by Saleh Faidah *et al*. in Makkah.[15] Due to social media and information accessibility, all age groups are informed. Internet information may not be accurate; therefore, different age groups have different knowledge. According to the study, parents in cities had more knowledge and awareness (3.20 ± 0.671) and (4.09 ± 0.644), respectively, than those in rural regions. City parents had more schools and health centers, which explains the awareness gap between the city and rural parents. This result supports a study in Irbid, Jordan, which found that mothers' attitudes toward handling URTI children depend on their education.[26]

Conclusion

This study demonstrates that the greater level of knowledge and awareness about the antibiotics to treat URTI in children was among the parents residing in urban areas compared to those residing in rural areas, parents in the age range of 31–40, and parents with higher levels of education.

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Conflict of interest

There are no conflict of interest.

References

1. Korppi M, Heikkilä P, Palmu S, Huhtala H, Csonka P. Antibiotic prescribing for children with upper respiratory tract infection: a Finnish nationwide 7-year observational study. Eur J Pediatr 2022;181:2981-90.
2. Sitthikarnkha P, Uppala R, Niamsanit S, Sutra S, Thepsuthammarat K, Techasatian L, *et al*. Epidemiology of acute lower respiratory tract infection hospitalizations in Thai children: A 5-year national data analysis. Influenza Other Respir Viruses 2022;16:142-50.
3. Selvarajan R, Obize C, Sibanda T, Abia ALK, Long H. Evolution and emergence of antibiotic resistance in given ecosystems: Possible strategies for addressing the challenge of antibiotic resistance. Antibiotics 2023;12:28.
4. Shallcross LJ, Davies DSC. Antibiotic overuse: A key driver of antimicrobial resistance. Br J Gen Pract 2014;64:604-5.
5. Alzaidi JR. Prevalence of OXA genes responsible for carbapenem-resistance among *Acinetobacter baumannii* isolated from clinical samples in Iraq. Med J Babylon 2023;20:632-7.
6. van Houten CB, Cohen A, Engelhard D, Hays JP, Karlsson R, Moore E, *et al*. Antibiotic misuse in respiratory tract infections in children and adults—a prospective, multicentre study (TAILORED Treatment). Euro J Clin Microbiol Infect Dis 2019;38:505-14.
7. Alzaidi JR, Aqeel AK. The impact of urogenital tract infectious bacteria on male fertility. Med J Babylon 2024;21:476-80.
8. Llor C, Bjerrum L. Antimicrobial resistance: Risk associated with antibiotic overuse and initiatives to reduce the problem. Ther Adv Drug Saf 2014;5:229-41.
9. Alzaid A, Alosaimi M, Alkahtani KF, Alshehri BA, Asiri AE, Asiri AM, *et al*. Saudi parents' knowledge, attitudes, and practices regarding antibiotic use for upper respiratory tract infections in children. Int J Pharm Res Allied Sci 2020;1:115-28.
10. Panagakou SG, Spyridis , Papaevangelou V, Theodoridou KM, Goutziana GP, Theodoridou MN, *et al*. Antibiotic use for upper respiratory tract infections in children: a cross-sectional survey of knowledge, attitudes, and practices (KAP) of parents in Greece. BMC Pediatr 2011;11:1-10.
11. Islam MW, Shahjahan M, Azad AK, Hossain MJ. Factors contributing to antibiotic misuse among parents of school-going children in Dhaka City, Bangladesh. Sci Rep 2024;14:2318.
12. Albayrak A, Karakaş NM, Karahalil B. Evaluation of parental knowledge, attitudes and practices regarding antibiotic use in acute upper respiratory tract infections in children under 18 years of age: a cross-sectional study in Turkey. BMC Pediatr 2021;21:1-10.
13. Joshi A, Kale S, Chandel S, Pal D. Likert Scale: Explored and Explained. Br J Appl Sci Technol 2015;7:396-403.
14. Zyoud SH, Taha AA, Araj KF, Abahri IA, Sawalha AF, Sweileh WM, *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.
15. Saleh Faidah H, Haseeb A, Yousuf Lamfon M, Mohammad Almatrafi M, Abdullah Almasoudi I, Cheema E, *et al*. Parents' self-directed practices towards the use of antibiotics for upper respiratory tract infections in Makkah, Saudi Arabia. BMC Pediatr 2019;19:46.
16. Mijović B, Aćimović J, Đaković Dević J, Kralj J, Lučić Samardžija V, Djermanović M, *et al*. Knowledge, attitudes and practices of parents and pediatricians regarding antibiotic use among children:

Differences in relation to the level of education of the parents in the Republic of Srpska Bosnia and Herzegovina. Antibiotics 2022;11:1325.
17. Alsuhaibani MA, AlKheder RS, Alwanin JO, Alharbi MM, Alrasheedi MS, Almousa RF. Parents awareness toward antibiotics use in upper respiratory tract infection in children in Al-Qassim region, Saudi Arabia. J Family Med Prim Care 2019;8:583-9.
18. Al-Saleh S, Abu Hammour K, Abu Hammour W. Influencing factors of knowledge, attitude, and practice regarding antibiotic use in children with upper respiratory tract infections in Dubai. J Eval Clin Pract 2020;26:197-202.
19. Chee Teck K, Faisal Ghazi H, Ikhwan M, Ahmad B, Binti N, Samad A, *et al*. Pilot study knowledge, attitude, and practice of parents regarding antibiotic usage in treating children's upper respiratory tract infection at primary health clinic in Kuala Lumpur, Malaysia: Pilot study. Health Serv Res Manag Epidemiol 2016;3:1-8.
20. Shtayyat KF, Abu-Baker NN. Knowledge, attitude, and practice toward antibiotic use with acute respiratory infection among parents of children under five years. Open Nurs J 2023;17:1-10.
21. Saeed M, Al-Ayed Z. Parents' knowledge, attitudes and practices on antibiotic use by children. Saudia J Med 2019;7:93-9.
22. Zeru T, Berihu H, Buruh G, Gebrehiwot H, Zeru M. Parental knowledge and practice on antibiotic use for upper respiratory tract infections in children, in Aksum town health institutions, Northern Ethiopia: a cross-sectional study. Pan Afr Med J 2020;35:142.
23. Albalawi GA, Abdulrahman Alzahrani S, Alotaibi AA, Salah Ghmaird A. International Journal of Medicine in developing countries knowledge, attitude, and practices of parents regarding the use of antibiotics among their children with upper respiratory tract infections. Int J Develop Countries 2020;4:753-8.
24. Hammour KA, Jalil MA, Hammour WA. An exploration of parents' knowledge, attitudes and practices towards the use of antibiotics in childhood upper respiratory tract infections in a tertiary Jordanian Hospital. Saudi Pharm J 2018;26:780-5.
25. Alrafiaah AS, Alqarny MH, Alkubedan HY, AlQueflie S, Omair A. Are the Saudi parents aware of antibiotic role in upper respiratory tract infections in children? J Infect Public Health 2017;10: 579-85.
26. Abu-Baker NN, Gharaibeh HF, Al-Zoubi HM, Savage C, Gharaibeh MK. Mothers' knowledge and practices of managing minor illnesses of children under five years. J Res Nurs 2013;18:651-66.