



Research Article

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Knowledge, Attitude and Practice Towards Vaccination among Parents in Al Qassim Region, Saudi Arabia

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Abstract

Introduction: Immunization is the most effective health intervention which reduces hospitalization, morbidity and mortality. It's become the vital part in public health and plays the major role in disease prevention but remains a controversial topic in our society. It has been recently reported by WHO that a large proportion of children fail to complete their immunization schedule.

Aim: This study aimed to assess knowledge, attitude, and practice of parents towards vaccination and compare findings with demographic characteristics of the studied group.

Materials and methods: This is a cross-sectional study to parents who work in Qassim schools (Buraydah, Unayzah, Al-Methnab, Al-Rass, Riyadh Al-Khabra, Al-badayea) and also distributed among health centers in villages and cities as well as hospitals. Validated questionnaire consisted of three sections that collected information on parents' demographics, awareness, knowledge of vaccine benefits and practices regarding the immunization of their children were distributed among targeted parents. The questionnaire had brief explanation of the idea of the research to children parents. Data was collected through online and paper questionnaire, Responses to knowledge questions were recorded as "Yes", "No", "I don't know", "disagree", "agree" and "neutral." All data analyses were carried using SPSS version 21.

Results: The overall mean knowledge score was 6.29 ± 1.95 out of 10 and moderate, good and poor knowledge were found to 66.9%, 26.6% and 6.5% of parents respectively. With regards to attitude, the overall mean attitude score was 19.2 ± 1.67 out of 21 and nearly all parents had positive attitude (82.7%) followed by average (16.1%) and negative attitude (1.2%). With regards to practice, the overall practice score was 20.9 ± 2.28 out of 24 and good, moderate and poor attitude were observed to 60.9%, 36.7% and 2.4% of the parents respectively. Furthermore, Child unable to complete vaccinations was identified as the significant factor of knowledge ($T=-2.861$, $p=0.004$), attitude ($t=-3.469$, $p=0.007$) and practice score ($T=-3.642$, $p<0.001$).

Conclusion: There is a moderate knowledge among parents toward childhood immunization while the consensus to attitude and practice deemed positive and good. Furthermore, unable to complete child vaccination was the significant predictor of knowledge, attitude and practice toward childhood vaccination.

Keywords: Vaccination; Knowledge; Attitude; Practice; Parents; Childhood

Statistical Analysis Method

Descriptive statistics had been presented using counts, proportions (%), mean \pm standard deviation whenever appropriate. The comparison between the knowledge, attitude and practices (KAP) score had been conducted using Chi Square test. A correlation procedure of knowledge, attitude and practice score were also conducted to determine the linear relationship of each KAP score. A p-value cut off point of 0.05 at 95% CI

used to determine statistical significance. Statistical collinearity was measured using Shapiro Wilk test. All data analyses were performed using the statistical package for social sciences, version 21 (SPSS, Chicago, IL, USA) [1]. The evaluation of parents' knowledge toward child vaccination which comprised of 10 question has been described at table 1 where the correct answer for each question has been presented and coded as 1. The total

knowledge score has been calculated by adding the 10 questions and an overall score range from 0 to 10 has been generated. Parents were classified as having low knowledge by the score range of 0-3, moderate knowledge by the score range of 4-7 and high knowledge by the score range of 8-10. The assessment of parents' attitude toward child vaccination which composed of 7 questions has been elaborated at table 2 where "disagree" coded as 1, "neutral" coded as 2 and "agree" coded as 3 were the answer options [2]. The total attitude score has been calculated by summing up the 7 questions and total score range from 9-21 has been generated. Parents were classified as having negative attitude by the score

range of 9-13, average attitude by the score range of 14-18 and positive attitude by the score range of 19-21. The measurement of parents' practice toward child vaccination which consisted of 8 question has been determined at table 3 where "disagree" coded as 1, "neutral" coded as 2 and "agree" coded as 3 were the answer options. The total practice score has been computed by adding up the 8 questions and a total score range from 12-24 has been generated. Parents were classified as having low practice by the score range of 12 to 15, moderate practice by the score range of 16-20 and high practice by the score range of 21-24 [3].

Table 1: Determinants of parents' knowledge toward child vaccination⁽ⁿ⁼⁴¹⁷⁾.

Knowledge Statement	Correct Answer N (%)
Mandatory vaccinations protect children from infectious diseases	360 (86.3%)
The first vaccine is given at birth	384 (92.1%)
Most diseases vaccinated against occur in the first year of life	173 (41.5%)
Multiple doses of the same vaccine are given at period that are important in child	296 (71.0%)
Vaccination with more than one vaccine at the same time has no side effects on child	152 (36.5%)
It's important to vaccinate during vaccination campaigns	317 (76.0%)
Its recommended to vaccinate against seasonal flu	184 (44.1%)
Vaccination can cause Autism	232 (55.6%)
Flu, ear infections and diarrhea are not contraindications of vaccination	137 (32.9%)
Some vaccines have side effects like Fever	392 (94.0%)

Table 2: Determinants of parents' attitude toward child vaccination⁽ⁿ⁼⁴¹⁷⁾.

Attitude Statement	Disagree N (%)	Neutral N (%)	Agree N (%)
Vaccinations are important for protecting children	05 (01.2%)	34 (08.2%)	378 (90.6%)
Vaccinations have more benefits than harms	09 (02.2%)	43 (10.3%)	365 (87.5%)
Vaccinations are safe for children	03 (0.70%)	51 (12.2%)	363 (87.1%)
Religion forbid vaccination	386 (92.6%)	24 (05.8%)	07 (01.7%)
Children can get the diseases they're vaccinated against	168 (40.3%)	129 (30.9%)	120 (28.8%)
Following the mandatory vaccination schedule	09 (02.2%)	24 (05.8%)	384 (92.1%)
Vaccinations preserve children's health	08 (01.9%)	37 (08.9%)	372 (89.2%)

Table 3: Determinants of parents' practice toward child vaccination⁽ⁿ⁼⁴¹⁷⁾.

Practice Statement	Disagree N (%)	Neutral N (%)	Agree N (%)
Advice/counseling is given by doctors	27 (06.5%)	51 (12.2%)	339 (81.3%)
Vaccination was done on correct dates	13 (03.1%)	41 (09.8%)	363 (87.1%)
Getting information from HCP about the side effects	35 (08.4%)	53 (12.7%)	329 (78.9%)
Children had side effects after being vaccinated	154 (36.9%)	99 (23.7%)	164 (39.3%)
Continue vaccinating after having side effects	117 (28.1%)	112 (26.9%)	188 (45.1%)
All children completed their vaccinations	29 (07.0%)	23 (05.5%)	365 (87.5%)
Intending to vaccinate the new child	10 (02.4%)	16 (03.8%)	391 (93.8%)
Completely satisfied about vaccination in Saudi Arabia	26 (06.2%)	45 (10.8%)	346 (83.0%)

HCP: Healthcare Provider.

Results

The majority of the surveyed mothers (79.4%) were between 31-40 years old (52.0%) with nearly all were Saudis (97.8%) and living in Urban (89%). With regards to parents' education,

a high proportion of fathers and mothers had bachelor or higher degree with 65.9% and 76.3% respectively. Of them, a relatively fewer were working at medical field (4.8%) with more than a half had more than three children (58.5%). Additionally, there were

44.6% of them were having a child under school age while many of the parents stated that their child was able to finish complete vaccinations (69.8%) (Table 4 & Figure 1).

Figure 1 presented the distribution of residence city of parents. Majority of them were living in Al-rass (35.5%), followed by Al-badaya (14.1%) and Almethnab (14.1%) while the least of them were living at Albukayriyah (Table 1). The details of the determinants of parents' knowledge toward child vaccination has been elaborated at table 1. Based on the results, nearly all of them (86.3%) believe that mandatory vaccinations protect children from infectious diseases and most of them believe that first vaccine should be given at birth (92.1%) [4]. However, majority of them were unaware that most diseases occur in the first year of life (41.5%) while their knowledge was high with regards to the statement about "multiple doses of the same vaccine are given at period that are important in child" (71.0%). Furthermore, their knowledge was low with regards to the statement about "vaccination with more than one vaccine at the same time has no side effects on child immunization" (36.5%) while most of them believe that it is important to vaccinate during vaccination campaigns (76.0%). A low knowledge was also determined with regards to the recommendation to vaccinate against seasonal flu (44.1%) while their knowledge was moderate with regards to the statement about "vaccination can cause autism" (55.6%). In contrast, their knowledge was poor with regards to the statement about "Flu, ear infections and diarrhea are not contraindication of vaccination" (32.9%) whereas nearly all of them believe that some vaccines have side effects like fever (94%) (Table 2). In the determinants of parents' attitude toward child vaccination, it was revealed that among the 7 determinants of attitude, most of them agreed on the following statement such as "Vaccinations are important for protecting children" (90.6%), "Vaccinations have more benefits than harms" (87.5%), "Following the mandatory vaccination schedule" (92.1%) and "Vaccinations preserve children's health" (89.2%) [5]. On the other hand, most of them disagreed with regards to the statement about "Religion forbid vaccination" (92.6%) while majority of the parents also disagreed in the statement about "Children can get the diseases they're vaccination against" (40.3%) (Table 3). In the determinants of parents' practice toward child vaccination, we found that among 8 statements that determined their practice, nearly all of them agreed on the following statements such as; "Advice/counseling is given by doctors" (81.3%), "Vaccination was done on correct dates" (87.1%), "Getting information from healthcare provider about the side effects of vaccination" (78.9%), "All children completed their vaccinations" (87.5%), "Intending to vaccinate the new child" (93.8%) and "Completely satisfied about vaccination in Saudi Arabia" (83%). On the other hand, parents had poor practices on the following statement such as; "Children had side effects after being vaccinated" (39.3%) and "Continue vaccinating after having side effects" (45.1%) (Table 5). Table 5 showed the prevalence of parents' knowledge, attitude and practice toward childhood

vaccination. Based on the results, the overall mean knowledge score was 6.29 ± 1.95 out of 10 and the level of knowledge showed, 26.6% of the parents had good knowledge, 66.9% of moderate knowledge and 6.5% of poor knowledge. With regards to attitude, the overall mean attitude score was 19.2 ± 1.67 out of 21 and the level of attitude showed, 82.7% of the parents were classified as having positive attitude, 16.1% found to have average attitude and 1.2% found to have negative attitude. With regards to practice, the overall mean practice score was 20.9 ± 2.28 out of 24 and the level of practice showed, 60.9% were identified as having good practices, 36.7% of moderate practice and 2.4% of poor practice (Figure 2).

Table 4: Socio demographic characteristics of parents⁽ⁿ⁼⁴¹⁷⁾.

Study Variables	N (%)
Age Group	
20 - 30 years	56 (13.4%)
31 - 40 years	217 (52.0%)
>40 years	144 (34.5%)
Gender	
Mother	331 (79.4%)
Father	86 (20.6%)
Nationality	
Saudi	408 (97.8%)
Non-Saudi	09 (02.2%)
Residence Place	
Urban	371 (89.0%)
Rural	46 (11.0%)
Father Educational Level	
High school or below	142 (34.1%)
Bachelor or higher	275 (65.9%)
Mother Educational Level	
High school or below	99 (23.7%)
Bachelor or higher	318 (76.3%)
Working in Medical Field	
Yes	20 (04.8%)
No	397 (95.2%)
Number of Children	
One	58 (13.9%)
Two to three	115 (27.6%)
More than three	244 (58.5%)
Having Children Under School Age	
Yes	186 (44.6%)
No	231 (55.4%)
Number of Children Who Were Unable to Complete Vaccinations	
None	291 (69.8%)
One	101 (24.2%)
Two to three	25 (06.0%)

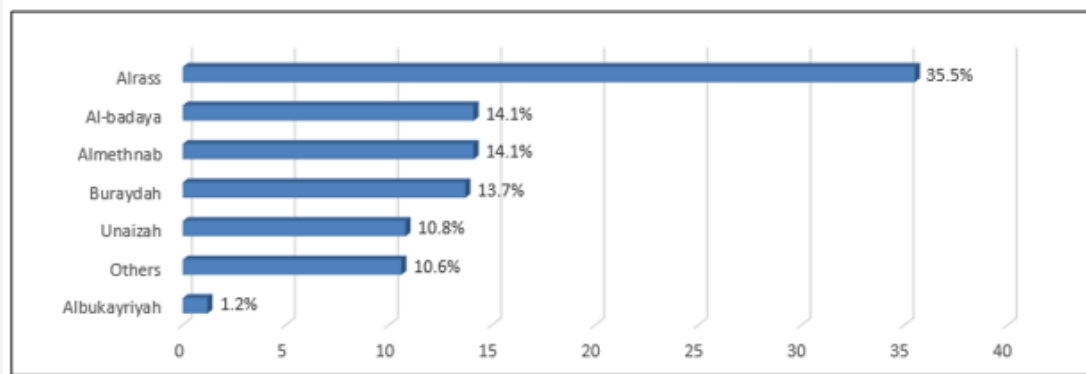


Figure 1: Distribution of residence city of parents.

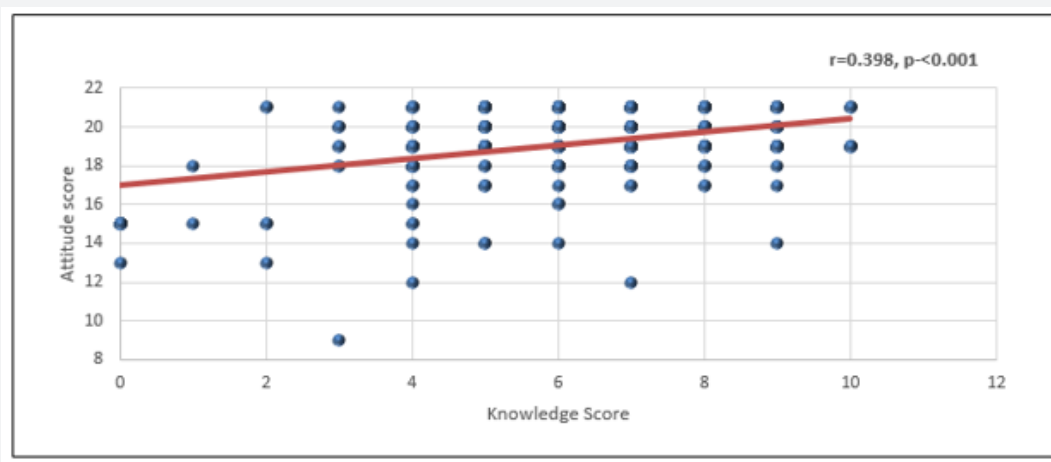


Figure 2: Correlation (Pearson-R) between knowledge and attitude score.

Table 5: Prevalence of parents' knowledge, attitude and practice toward child vaccination⁽ⁿ⁼⁴¹⁷⁾.

Level of knowledge	
Poor	27 (06.5%)
Moderate	279 (66.9%)
Good	111 (26.6%)
Attitude Score (mean±SD)	19.2±1.67
Level of attitude	
Negative	05 (01.2%)
Average	67 (16.1%)
Positive	345 (82.7%)
Practice score (mean±SD)	20.9±2.28
Level of practice	
Poor	10 (02.4%)
Moderate	153 (36.7%)
Good	254 (60.9%)

A Pearson correlation has been conducted at figure 2 to determine the linear relationship between knowledge and attitude score. It was found that a highly positive correlation was detected

between knowledge and attitude score ($r=0.398, p<0.001$) suggesting that while the knowledge is increased the attitude also will likely increase (Figure 3). In Figure 3, the correlation was statistically highly significant between knowledge and practice score ($r=0.442, p<0.001$), suggesting that while the knowledge is increased the practice will also increase (Figure 4). In figure 4, it was found that a positive significant correlation has been observed between attitude and practice score which indicates that an increase of parents' attitude will also signifies an increase of practice (Table 6). When comparing the knowledge, attitude and practice score among the socio demographic characteristics of parents, we found that, those parents with having two to three children are significantly less of having knowledge score ($F=3.619, p=0.041$) while attitude and practice score did not differ significantly among the number of children. Those parents with having children under school age are significantly less of having knowledge score ($T=-3.003, p=0.016$) and practice score ($T=-1.913, p=0.032$) but no difference found on attitude score [6]. We also observed that those parents who were able to complete vaccinations schedule have significantly more of having knowledge score ($T=-2.861, p=0.004$), attitude score ($T=-3.469, p=0.007$) and practice score ($T=-3.642, p<0.001$). On the other hand, age group,

gender, nationality, city, residence place, father educational level, mother educational level and working in medical field did not differ significantly among the knowledge, attitude and practice score (Table 6).

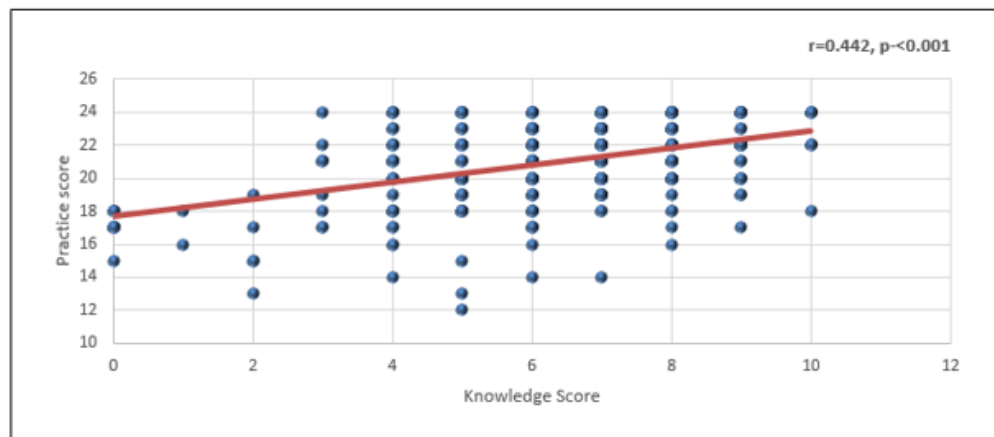


Figure 3: Correlation (Pearson-R) between knowledge and practice score.

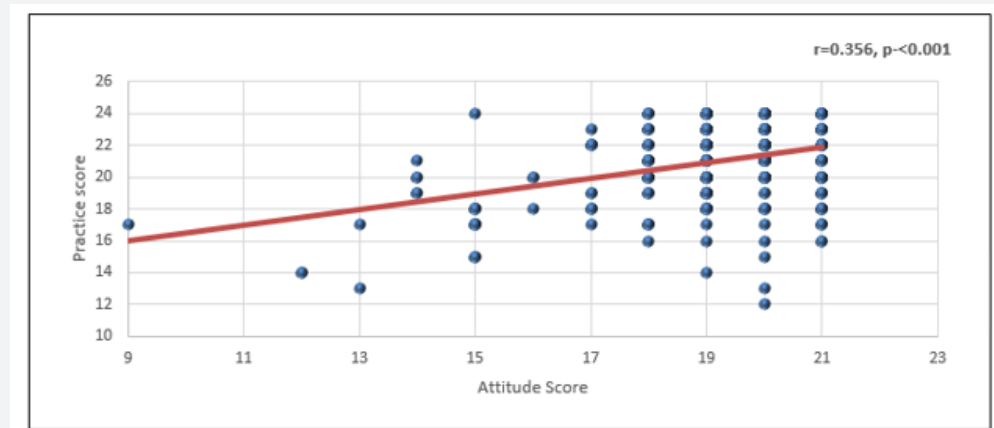


Figure 4: Correlation (Pearson-R) between attitude and practice score.

Table 6: Comparison of knowledge, attitude and practices score among the socio demographic characteristics of parents⁽ⁿ⁼⁴¹⁷⁾.

Factor	Knowledge Total Score (10) (mean±SD)	Attitude Score Total Score (21) (mean±SD)	Practice Total Score (24) (mean±SD)
Age group^a			
20 – 30 years	6.45±1.99	19.4±1.31	21.0±2.17
31 – 40 years	6.25±1.98	19.0±1.75	20.9±2.22
>40 years	6.31±1.88	19.3±1.64	21.0±2.41
F=Test; P-value	F=0.223; 0.622	F=2.008; 0.069	F=0.102; 0.662
Gender^b			
Mother	6.31±2.02	19.1±1.73	20.9±2.30
Father	6.26±1.66	19.4±1.37	21.2±2.17
T=Test; P-value	T=0.235; 0.428	T=-1.660; 0.141	T=-1.184; 0.284
Nationality^b			
Saudi	6.29±1.95	19.2±1.66	20.9±2.28
Non-Saudi	6.56±2.07	19.0±2.00	21.0±2.29
T=Test; P-value	T=-0.398; 0.875	T=0.324; 0.985	T=-0.035; 0.901

City ^b			
Inside Alrass	6.21±2.17	19.2±1.77	20.9±2.54
Outside Alrass	6.35±1.81	19.2±1.60	21.0±2.13
T=Test; P-value	T=-0.702; 0.985	T=0.230; 0.312	T=-0.723; 0.914
Residence place ^b			
Urban	6.29±1.95	19.2±1.64	20.9±2.28
Rural	6.33±1.89	19.1±1.82	21.2±2.28
T=Test; P-value	T=-0.097; 1.000	T=0.391; 0.941	T=-0.838; 0.355
Father educational level ^b			
High school or below	6.28±2.00	19.1±1.82	20.8±2.24
Bachelor or higher	6.31±1.92	19.2±1.57	21.1±2.29
T=Test; P-value	T=-0.136; 0.949	T=-1.007; 0.280	T=-0.964; 0.264
Mother educational level ^b			
High school or below	6.09±1.84	19.2±1.71	20.8±2.28
Bachelor or higher	6.36±1.98	19.2±1.65	21.0±2.28
T=Test; P-value	T=-1.223; 0.163	T=0.376; 0.522	T=-0.777; 0.389
Working in medical field ^b			
Yes	6.45±2.74	19.3±1.45	20.7±2.07
No	6.29±1.90	19.2±1.67	20.9±2.29
T=Test; P-value	T=0.353; 0.427	T=0.338; 0.996	T=-0.450; 0.441
Number of children ^a			
One	6.33±2.05	19.1±1.54	21.1±2.35
Two to three	5.89±2.16	19.2±1.61	20.8±2.34
More than three	6.48±1.79	19.2±1.72	21.0±2.24
F=Test; P-value	F=3.619; 0.041**	F=0.070; 0.608	F=0.561; 0.531
Having children under school age ^b			
Yes	5.98±2.17	19.1±1.72	20.7±2.31
No	6.55±1.70	19.3±1.61	21.2±2.24
T=Test; P-value	T=-3.003; 0.016**	T=-1.306; 0.263	T=-1.913; 0.032**
Child unable to complete vaccinations ^b			
Yes	5.89±2.43	18.8±2.07	20.4±2.41
No	6.48±1.67	19.4±1.42	21.2±2.17
T=Test; P-value	T=-2.861; 0.004**	T=-3.469; 0.007**	T=-3.642; <0.001**

^aP-value has been calculated using Kruskal Wallis test.

^bP-value has been calculated using Mann Whitney U test.

**Significant at p<0.05 level.

Discussion

The prevention toward many diseases started during childhood vaccination. Nevertheless, childhood immunization is an inadvertent method to evaluate child health care [7]. The present survey aimed to give further insights regarding the knowledge, attitude and practice of parents toward childhood vaccination. The overall knowledge score of parents toward childhood vaccination was 6.29 ± 1.95 out of 10 and moderate knowledge were found to two-third of the parents (66.9%), followed by good knowledge (26.6%) and poor knowledge (6.5%). In Central Region [8], the total knowledge score of parents regarding childhood vaccination was slightly higher than our results with 8.08 ± 1.8 out of 11 while

in a paper published by Habib et al, [9] it was determined that the overall Knowledge, Attitude and Practice (KAP) of parents toward childhood immunization was generally good among 87.2% of the parents which was also higher than our study findings. In neighboring country [10], the overall knowledge score of parents was 8.58 ± 2.19 with majority of the parents had moderate knowledge (63.3%), followed by high knowledge (23.3%) and low knowledge (13.5%) which was in accordance with our study findings. However, in Nepal [11], a great proportion of the parents were found to have good knowledge (72.5%) and this has been corroborated by the study published in India [12], where they reported 72.7% of the parents were having good knowledge,

followed by average (21.8%) and poor knowledge (5.4%). These results showed better knowledge when compared to our study outcome. This study has shown that the attitude of parents toward childhood immunization was generally positive (82.7%) while the rest were either having an average attitude (16.1%) or negative attitude (1.2%) with an overall mean attitude score of 19.2 ± 1.67 out of 21. This report is consistent from the paper published in India [12]. They reported good attitude toward childhood vaccination had been detected from 85.4% of the parents, while average and poor knowledge were detected from 11.8% and 2.7% respectively. In Georgia [13], most mothers (97%) had positive attitude toward child immunization which was slightly higher than our study outcome. Additionally, a positive attitude toward childhood immunization were also reported in a study conducted by Bamatraf & Jawass [10], which was congruent with our study result. The overall practice toward childhood immunization was generally good which was observed from 60.9% of the parents, followed by moderate practice 36.7% and few had poor practice (2.4%) with a mean score of 20.9 ± 2.28 out of 24 points. To our knowledge this is the first paper in Saudi Arabia that calculated the overall mean practice score of the parents. On the other hand, a study published in Malaysia [14], reported that female participants had better practice than male participants (Female 48.3% vs Male 38.4%). It also important to note that nearly all parents (87.5%) in this study indicated that their child completed the immunization programs. Various papers reported good adherence to childhood immunization [11-13]. In contrast, Vezzosi et al, [15] accounted that more than one third of parents had vaccinated their child (38.4%) and almost two-third were actually encourage by their healthcare professionals to vaccinate their child which was not consistent with our study result.

Moreover, a positive but highly significant correlation had been detected between knowledge, attitude and practice score. Suggesting that, as the knowledge score increase the attitude and practice score will also increase. This finding is consistent from the paper published by Al-Zahrani [8]. He reported a moderate positive correlation had been observed between total knowledge score and total attitude score of child vaccination. This has been supported by Trushitkumar et al, [12] which they observed a very significant correlation was seen between the parental knowledge and attitude score. In this study, we also discovered that the knowledge of those parents with two to three children are significantly less compared to those with one child or more than three children. Furthermore, those with having children under school age are significantly less of having knowledge and practice toward the childhood immunization while those parents who were unable to complete childhood vaccination programs were also found to have less knowledge, attitude and practice toward childhood vaccination compared to those who were able to complete childhood vaccinations program. The factors associated with KAP varies with each region. For example, in Saudi Arabia, Al-Zahrani [8], reported that the factors significantly associated with better knowledge score and positive parental attitude

regarding child vaccination were source of information about child vaccination from TV, internet and journals/newspapers, parents with first child, younger age, and higher level of education while Yousif et al, [16] indicated gender, residence and educational level were the factors significantly associated with both parents knowledge and attitude towards immunizations. In neighboring country [10], they accounted age group and the number of their pre-school children were statistically significant at the mean score of knowledge. In Nepal [11], many factors were attributed to the level of knowledge such as gender, ethnicity, education level, occupation, having radio, TV and mobile phone at home while ethnicity, occupation living condition and education were statistically significant for immunization practice. In Georgia [13], a significant association was found between mothers' education, practice and attitude regarding immunization.

Conclusion

There is a moderate knowledge among parents toward childhood immunization while the consensus toward attitude and practice deemed positive and good. Furthermore, unable to complete child vaccination was the significant predictor of knowledge, attitude and practice toward childhood vaccination. In this regard, an increase of knowledge toward childhood vaccination is needed in our region. Thus, it is necessary to raise community awareness on the importance of immunization by education programmes, internet and mass media.

Conflict of Interest

The author declares that there is no conflict of interest.

Ethical Approval Statement

The local IRB had approved this study, individual verbal consent was taken prior to participation.

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