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## Parents' Knowledge, Attitude, and Misconceptions Towards Vaccination Practices for Their Children, as Determined by a Cross-Sectional Study in the City of Nalut, Libya

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### ABSTRACT

The study aimed to determine the knowledge, attitude, and misconceptions of parents about the practice of childhood vaccinations. The study followed a descriptive, analytical approach in a cross-sectional study of workers in several schools (middle and high school), in addition to those attending the Sidi Khalifa Health Vaccination Center in the city of Nalut. The sample totaled 1,024 participants, and 24 participants were excluded. The questionnaire was distributed to the participants in addition to a face-to-face dialogue with the participants. The questionnaire consists of four axes: The first axis talks about the demographic characteristics of the participants, then three axes in order about the wrong beliefs, attitudes, and knowledge of parents about practicing vaccinations for their children. From December 2022 to July 2023, the study was conducted and the results were analyzed using SPSS. The results showed that the average age of the sample was 25-30 years. The educational level of the participants was 609 (60.9%) for those with university degrees. Marital status was divided between married (719), divorced (169), and widows (112). There was a correlation between the age of the participants and misconceptions about vaccinations (P-value < 0.05). It was also found that the level of misconceptions was low among the participants. The attitude of the participants towards the practice of vaccinations was positive 56.80%. It was also found that there was a correlation (P-value < 0.05) between the attitude towards practicing vaccinations and the educational level of the participants (36.78%) and their knowledge of vaccinations. An association was also found between the marital status of the participants and their tendency to practice vaccinations ( $X^2 = 163.815$ ,  $P = 0.000$ ).

### INTRODUCTION

Immunization is a global success story in the field of health. We now have vaccines to prevent more than twenty life-threatening diseases, and immunization currently prevents between 3.5 million and 5 million deaths annually due to diseases such as Diphtheria, tetanus, whooping cough, influenza, and measles (WHO, 2018). The Advisory Committee on Immunization Practices recommends routine vaccination of children by age 2, but evidence suggests that only 2% to 26% of children receive vaccine doses at age-appropriate times (Kurosky *et al.*, 2016). The World Health Organization defines vaccine hesitancy as “delay in accepting or refusing vaccines despite the availability of vaccination services” It is a complex matter and varies depending on time, place, and vaccines. Individuals who are reluctant to receive vaccines constitute a heterogeneous group. They may reject some vaccines but agree with others. They may postpone receiving vaccines or accept them according to the recommended schedule while remaining unsure (Alsuwaidi *et al.*, 2020). Myths and misinformation are among the main factors contributing to parents' reluctance to complete vaccinations for their children. Among the widespread beliefs is that the measles vaccine causes autism in children. Catching the disease is better than facing the side effects of the vaccine. Natural immunity acquired through infection with the disease

is better than immunity generated by vaccination, and vaccine beliefs have been linked to partial and complete incompleteness of vaccines in Brazil (KallasSilva *et al.*, 2025). A study in Saudi Arabia included parents of 390 children. Factors that were associated with better knowledge among parents about vaccinating children were young mothers and working mothers, an increase in the level of education of mothers and fathers, and a positive correlation with significance between knowledge and the trend towards vaccinating children (Al-Zahrani J, 2020). Knowledge and trust are contributing factors to vaccine acceptance, and a significant decline in childhood vaccination has been observed in recent years. One of the most important reasons that influence mothers' decision to postpone or avoid vaccinating their children is knowledge and confidence in children's vaccines. This is what was revealed by a study evaluating mothers' knowledge and confidence in vaccinating their children in Rwanda. In a cross-sectional survey, out of 2,126 fathers and mothers, the percentage of those who had good knowledge and confidence in vaccinating children was 95.5%. The study showed that good knowledge and confidence in vaccinating children are linked to education, profession, and income (Mbonigaba *et al.*, 2024). Monthly studies have confirmed that mothers' education and practice of vaccinations has a positive impact on immunization status, and that awareness

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of vaccination is much higher among mothers with higher education. Negative attitudes from parents, such as the mother's fear of vaccination, the negative effects of vaccination, and the tendency to abstain from vaccination, are also considered obstacles to vaccinating the child. According to the survey conducted in Georgia, the main reason for abstaining from vaccinations was the negative attitude towards vaccination (Verulava *et al.*, 2019). Evaluating parents' attitudes toward childhood vaccines and determining the prevalence of vaccination reluctance among parents and its relationship to the social and demographic characteristics of the parents. This was the goal of a study conducted in Malaysia. A questionnaire was used to collect information and conduct a correlation test. It was noted in the results that a total of 63 (11.6%) parents was reluctant to vaccinate their children. Hesitation was associated with unemployed and younger parents who have fewer children. The results also showed that the Internet (65.6%) is the main source of information about vaccinations (Azizi *et al.*, 2017). The great interest in the debate over vaccinations makes it increasingly important to understand how parents make the decision to vaccinate their children. Open qualitative interviews were conducted for participants that included mothers one to three days after giving birth, and then they were re-asked three to six months later about their practice of vaccinations. The results addressed three axes: attitude towards vaccinations, knowledge of vaccination, and decision-making. It was found that the number of mothers who intended to vaccinate their children was 25. They either agreed to the vaccination, doubted it, or accepted the vaccination, but they had great fears. Among the results was that there were 8 mothers who did not intend to be vaccinated, and they either refused the vaccination completely or chose only some vaccines. The results also showed that knowledge of the recommended vaccines for children is weak among both vaccinated and unvaccinated children, and it was also found that they are concerned about the permanent side effects of vaccinations (Benin *et al.*, 2006). 3,924 participants were interviewed to find out the response rates to vaccinations for their children, which reached 57.9% in 2003 and 65.0% in 2004. Concern about the safety of the vaccine was an indicator for parents who were unsure, disapproving, and late. The results also showed that delaying or not getting vaccinated for their children did not receive any information or confirmation from the health care provider as a main reason (Gust *et al.*, 2008). This study was conducted after conducting several field visits to several facilities in the city of Nalut to identify a problem for research that focused on the factors that would increase or decrease vaccination practice. The aim of the study is to determine the knowledge, attitude, and false beliefs of parents about practicing vaccinations for their children among residents of the city of Nalut, Libya.

## MATERIAL AND METHODS

The current study is a cross-sectional study of the Nalut

city community of parents to determine their knowledge, attitude, and misconceptions regarding the practice of vaccinations for their children. The study was conducted for parents with qualifications in the education and health sectors in several schools (5 government preparatory and secondary educational schools) and the health center (Sidi Khalifa) in the region for a sample number of 1,024 participants in a random manner. 24 participants were excluded as a result of not completing or receiving the questionnaire papers from them. The study was conducted between December 2022 and July 2023 among parents aged 20 to 40 years and above who frequent the health center and have a child to be vaccinated in the center's clinics, and among parents working in other sectors such as education and other professions. Approval to conduct the study was awarded by the Governing Council of Nalut University (NU) during 2022. Use the questionnaire as a 4-axis study instrument. The first theme addressed the participants' demographic information, which included gender, age, educational level, family income, marital status, and occupation; the second theme talked about misconceptions about vaccinations and included 8 questions; the third theme included questions about the attitude toward practicing vaccinations; and the fourth theme related to the knowledge of vaccinations and included 9 direct questions in particular. The results were analyzed using the descriptive statistics SPSS (frequencies, percentages, and arithmetic mean) to describe the study variables. Using the Pearson correlation test and the chi-square test to find the relationship between the study variables considering a value of P-value > 0.05.

## RESULTS AND DISCUSSION

A total of 1,000 participants were in this study, the results of which were analyzed into percentages and frequencies of demographic factors for the participants. As shown in Table (1), the number of males reached 476 (47.6%), and the number of participating females (52.4%) was 524. The age of the participants was between 20 and over 40, with the ages between 20 and 25 years reaching 367 participants and the ages between 25 and 30 years reaching 207, the ages between 30 and 35 years reaching 242 participants, and the lowest age of participation being <40 years (184), and the average age among the participants was between the ages of 30 and 25 years. The educational level of the participating sample, as shown in Table (1), for university degree holders was 609 participants, followed by 156 participants for secondary school certificate holders, 122 for preparatory certificate holders, and 25 for primary certificate holders, 65 participants had advanced degrees, and 23 of the participants did not enroll in educational institutions. The monthly income of 422 > 1200 Libyan dinars per month was 1200-900 Libyan dinars for 343 participants, 228 of whom had a share of 900-600 Libyan dinars during the month. 719 study participants were married, 169 participants were divorced, and 112 participants were widowed. 409 of the participants' jobs were teaching, while 356 participants were state

employees in various sectors, 366 had self-employment, and 103 participants were medical professionals (Table 1).

**Table 1:** Socio Demographic characteristics of the study participation

Item	Demographic variables	Freq.	(%)
Gender	Male	476	47.6%
	female	524	52.4%
Age	25-20	367	36.7%
	30-25	207	20.7%
	35-30	242	24.2%
	>40	184	18.4%
Level of Education	Did Not Attend An Educational	23	2.3%
	Elementary	25	2.5%
	Preparatory	122	12.2%
	High School	156	15.6%
	Under Undergraduate	609	60.9%
	Postgraduate	65	6.5%
Monthly income	600 - 900	228	22.8%
	900 - 1200	343	34.3%
	>1200	429	42.9%
Social situation	Married	719	71.9%
	Absolutism	169	16.9%
	Widower	112	11.2%
Occupation	Teacher	409	40.9%
	Employe	356	35.6%
	Freelance work	103	10.3%
	Medical professions	87	8.7%
	Other	45	4.5%

Misconceptions about vaccinations included several questions in particular, the answers of the participants, which amounted to 440 (44%) participants, about the belief that vaccinations weaken the infant's immune system, and also the belief that vaccinations cause autism 369 (36.9%). We find that 382 (38.2%) of the participants believe that vaccinations lead to sudden infant death syndrome, believe that the side effects of the vaccine are

serious 252 (25.2%) believe that vaccinating children is a risk factor for asthma and allergies. This is what (Table 2) showed. The results of the correlation test between parents' beliefs about vaccinations and the ages of the participants had a fairly ideal positive relationship, as all variables were statistically significant at the significance level of P value > 0.05 (Table 2).

**Table 2:** Determine the relationship between participants' demographic characteristics and participants' beliefs about vaccinations

Beliefs about vaccinations	P. value	Correlation coefficient	Neuter	Disagree	Agree
Do you think that vaccinations weaken a child's immune system?		0.317**	134	426	440
Do you think vaccinating children is a risk factor for asthma and allergies?	0.000	0.116**	162	494	344
Do you think vaccinations cause autism?	0.012	0.713	186	445	369
Do you think that vaccinations lead to sudden infant death syndrome in children?	0.000	0.0325**	170	448	382
Do you think that the MMR measles vaccine, when received, causes meningitis?	0.000	0.256**	222	467	311

Do you think the side effects of the vaccine are serious?	0.002	0.098**	299	449	252
Do you think vaccinations are safe?	0.000	0.248**	172	355	473

Most of the beliefs among the participants were correct about vaccinations, with an acceptable percentage of 44.09%. However, despite this, it turns out that there are wrong beliefs among the participants. We find that

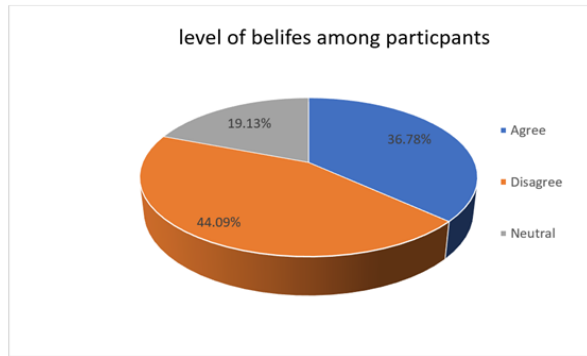


Figure 1: shows the Level of beliefs among participants

the percentage of 55.91% was for the two options: agree and neutral. Which shows a negative trend towards the practice of vaccinations among participants.

The tendency of participants practicing vaccinations for their children takes a positive direction among most participants, and this is evident from their positive answers, with good and somewhat satisfactory percentages. When participants are asked about their trust in health care service providers, we find it at an acceptable rate of 68.5%. Giving the vaccine at the specified time was also satisfactory at a rate of 54%. Not delaying the vaccination date beyond the recommended schedule was also accepted at a rate of 57.1%. Delaying the vaccine date was 56.6%. As for selecting or choosing the vaccinations given to children, it was 52.2%. It is also clear that there is a correlation between the participants' tendency to practice vaccinations for their children and the educational level of the participants, as p-value values were  $p\text{-value} > 0.05$ . Table (3)

Table 3: shows the participants' tendency to practice vaccinations for their children and its relationship to the participants' educational level

The attitudes towards practicing vaccinations	P. value	No	Correlation Coefficient	Yes
Do you have confidence in healthcare providers?	685 68.5%	0315 31.5%	0.002	0.097**
Do you give vaccines to your child on time?	540 54.0%	460 46.0%	0.000	0.145**
Have you ever delayed your child's vaccination?	566 56.6%	434 43.4%	0.000	1.171**
Do you follow the recommended vaccination schedule?	571 57.1%	429 42.9%	0.008	0.087**
Is it okay to choose and select vaccinations?	478 47.8%	522 52.2%	0.013	0.078*

We can summarize the participants' attitude toward practicing vaccinations as positive for most (56.80%), compared to those who have no attitude or tendencies toward vaccinating their children (43.20%). This is due to reasons that may be related to the level of educational knowledge about vaccinations (Figure 2).

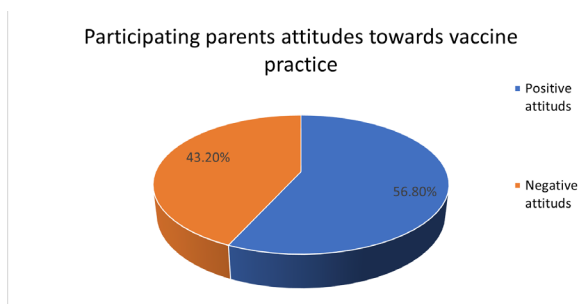


Figure 2: Participating parents' attitudes towards vaccine practices

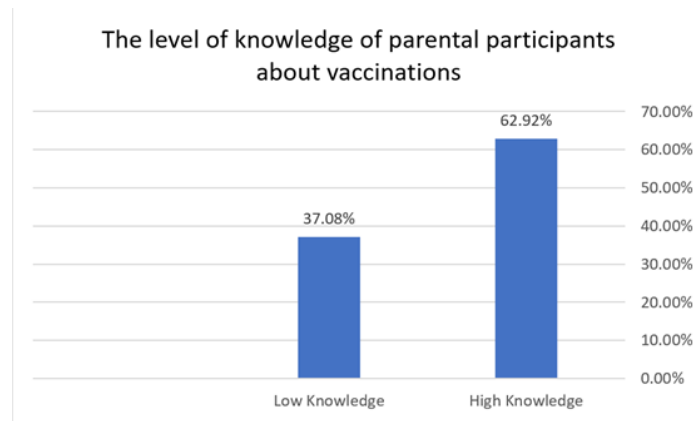
When measuring the cognitive educational level of participants regarding vaccinations, it was found that it is knowledge acceptable to parents. When asked about natural immunity, it is better than vaccination with a vaccine. Yes, was the answer given by 626 (62.6%). The participants' knowledge of the human papillomavirus (HPV) vaccine protects the future from cancer. Their knowledge was somewhat satisfactory, 593 (59.3%). Through the results of testing the correlation between vaccination practice and the educational level of the participants, it is clear that there is a correlation at  $p\text{-value} > 0.05$  (Table 4).

The level of knowledge about vaccinations among the participants was calculated and found to be somewhat acceptable (62.92%) compared to the level of knowledge among the participants. Their beliefs and educational level prevent them from practicing vaccination (37.08%).

**Table 4:** shows the relationship between the educational level of participants and their knowledge of vaccinations.

Parent participants' knowledge of vaccinations	P. Value	No	Correlation Coefficient	Yes
Are you aware that vaccines are extracts that contain microbes like bacteria and viruses?	679 67.9%	321 32.1%	0.000	0.155**
Is natural immunity superior to vaccination with a vaccine?	626 62.6%	374 37.4%	0.000	0.137**
Can a child receive a vaccination if they have a fever?	626 62.6%	374 37.4%	0.000	0.133**
Did you know that vaccines have eradicated many deadly diseases like smallpox and tetanus from the world?	676 67.6%	324 32.4%	0.011	0.081*
It's important to vaccinate your child against diseases that no longer exist, did you know?	611 61.1%	389 38.9%	0.001	0.109**
Did you know that your child is given multiple doses of the same type?	594 59.4%	406 40.6%	0.000	0.127**
Are you aware that the papillomavirus vaccine prevents cervical cancer?	593 59.3%	407 40.7%	0.000	0.114**

The level of knowledge among the participants can be observed in Figure (3).



**Figure 3:** The level of Knowledge of parental participants about vaccinations

The practice of vaccination is influenced by the marital status of the participants. According to the chi-square test, the marital status of participants is a significant factor in their tendency to practice vaccinations ( $X^2 = 163.815$ ,  $P = 0.000$ ). Most married people have a somewhat weak positive tendency to practice vaccinations, with a weak

percentage of 45.2%, followed by divorced people with 6.98% and widows with 4.62%. As for the negative trend for married people, 26.7%; divorced people, 9.92%; and widows, 6.58%. Through these percentages, we can say that marital status has an impact on the practice of vaccinations.

**Table 5 :** The relationship between the marital status of parents and their tendency to practice vaccinations.

Marital status	Attitude of parents to practice vaccination		X <sup>2</sup>	P. Value
	Yes	No		
Married	26.7%	45.2%	163.815	0.000
Absolutism	9.92%	6.98%		
Widower	6.58%	4.62%		
Total	43.2%	56.8%		

## Discussion

The study was conducted to determine the knowledge, attitude, and misconceptions of parents regarding the practice of vaccinations for their children. Demographic characteristics of study participants in a sample of 1,000 participants, including 476 (47.6%) males and 524 (52.4%) females, whose average age ranges between 25 and 35 years. The level of false beliefs was weak, 36.72%, while correct beliefs were also weak 44.05%. When determining the relationship between the ages of the study participants and their misconceptions about vaccinations, it was found that there was a significant relationship between the study variables ( $P$  value  $> 0.05$ ), and this result was consistent with the study (Facciola *et al.*, 2019). In which it was stated that vaccinations are negatively related to the age of the parents, we also note agreement with a study (Borras *et al.*, 2009). Which showed that the highest rate of vaccination coverage is linked to the aging mothers and their increased knowledge of vaccinations. The results of the study also showed that 62.92% have knowledge about vaccinations, unlike 37.08%, who do not have specific knowledge about vaccinations. These results contradicted the recent study, which showed that 23.26% of parents did not have specific information about vaccinations. The level of misconceptions was close to the results of a study (Giambi *et al.*, 2018). Which showed that safety concerns are the main reason for refusing vaccination or boycotting vaccination compared to the current study, where beliefs that vaccinations are safe (47.3%), and this result is consistent with the study (McKee & Bohannon, 2016). The results also showed a relationship between the participants' knowledge about vaccinations and the participants' educational level ( $p$ -value  $> 0.05$ ). This result was consistent with (Kalok *et al.*, 2020) and this result was also consistent with (Alyami *et al.*, 2018) Which showed that higher education has an impact and is linked to a commitment to practicing vaccinations. The positive trend in vaccination practice was low at 56.80% among the participants, and the negative trend was also low at 43.20%. These results were consistent with the results of the study (Hak *et al.*, 2005). The results also showed that there is a significant relationship between the marital status of the participants and their practice of vaccinations ( $P$  value  $> 0.05$ ), which is consistent with the study (Luman *et al.*, 2003).

## CONCLUSION

Through this study, we find that most participants practice vaccinations for their children, but these practices are not without factors that cause abstention or delay in fully covering vaccinations for children. One of these factors is the spread of misconceptions about vaccinations, which include concerns about the safety of vaccines. The educational level was also linked to the practice of vaccinations, which included the hesitation and lack of commitment of participants to giving vaccinations on time and selecting vaccinations. Family stability also has an effective role in the practice

of vaccinations. The determinants of the study were the participants' indifference to completing the questionnaire form, which led to the deletion of a number of them, and the community's lack of acceptance by helping this research spread and measure awareness and enhance its importance in dissemination.

This study recommends conducting future, more comprehensive and in-depth studies of the study sample, to precisely find out what are the reasons leading to the lack of vaccination coverage for children and the decline in society's tendency to practice vaccinations. We also recommend that part of the educational curriculum include lessons dedicated to vaccinations to correct the misconceptions entrenched in the minds of some people about vaccinations, and there is no objection to conducting educational courses for married or about-to-marry parents about the importance of practicing vaccinations.

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