

Original article

# Knowledge, Perception, and Practice of Libyan Mothers towards Varicella and Its Vaccination Tripoli, Libya

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## ABSTRACT

This study was conducted to ascertain the level of knowledge, perception and practice towards chickenpox infection and its vaccination and to find out the relationship of knowledge to some of related characteristics of the mothers and their children. A cross sectional study was conducted among Libyan mothers in Albadri polyclinic the east district of Tripoli. Data analysis was performed using the SPSS version 26. A total of 204 Libyan mothers attending Albadri polyclinic participated in the study their mean age was 32.06 ( $\pm$  7.664) years. Most of the respondents (95.6%) had heard about chickenpox and (84%) stated correctly about its mode of transmission. Majority were well aware of the signs and symptoms of the infection, (51%) of the respondents knew about chickenpox vaccination, and only (43.1%) have been known that the vaccine was available in Libya. Concerning perception (81.4%) of respondents had negative perception about their child might get chickenpox. (80.9%) of the respondents were agree about their believing that chickenpox is serious disease and only 12.3% respondents believed that vaccine was effective, (77.9%) of respondents had negative perception about safety of vaccine. Concerning practice approximately (80%) of the respondents had vaccinated or had intension for vaccination their children against chickenpox. The current study indicated considerable knowledge levels and practice on varicella disease and its vaccination were observed among Libyan mothers. Addressing concerns regarding vaccine effectiveness, safety and importance through educational campaigns to ensure that all mothers are informed of the availability and benefits of the varicella vaccine.

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## INTRODUCTION

Chickenpox is a common childhood disease, which also known as Varicella and herpes zoster (HZ, also Known as shingles) are caused by varicella-zoster virus (VZV), a highly contagious herpes virus [1,2]. Chickenpox appears most commonly in preschool. It is a febrile rash illness characterized by pruritic itchy rash, typically consisting of 250 to 500 lesions, and eventually into dried crusts over 5–6 days, and covered parts of the body, with the highest concentration on the trunk, can also occur on mucosal surfaces, such as the mouth and the throat. Prodromal

symptoms such as low-grade fever, malaise. The disease is usually milder among children, and immunity following chickenpox infection is considered to be long-lasting [3]. Varicella-zoster virus is present globally and, where there is no varicella vaccination program, majority of people become infected by mid-adulthood.<sup>[1]</sup> Chickenpox causes a relatively lower global burden of disease-specific Mortality than other major infectious diseases such as measles pertussis rotavirus, or invasive pneumococcal disease [4]. Despite the fact that chickenpox infection has relatively low morbidity and mortality rates in most settings, it still causes substantial burden on health care systems and the society at large [4-6]. Varicella may lead to serious complications, including secondary bacterial skin and soft tissue infections, cerebellitis, encephalitis, pneumonia, and coagulopathy [6].

Neonates, adolescents, and immunocompromised individuals are more susceptible to complications [7-9]. Reported rates of complications from varicella range from 40.7% to 83.3% among hospitalized children [10-14]. Mortality rates of 2 to 4 for every 100,000 infected people were noted [6]. More than 95% of the non-vaccinated populations were infected with varicella, and most of them are younger than 20 years [15]. Children younger than 10 years of age, particularly those between 3 and 6 years, exhibit a high incidence of infection when they do not receive varicella vaccine as part of a universal vaccination program [16]. Since the introduction of universal vaccination, a number of countries have witnessed declines in varicella incidence, hospitalization, and/or mortality, including the United States of America [17, 18], Australia [19], Italy [20], Germany [21], and Taiwan [22]. Varicella vaccination provides long-term effectiveness in preventing varicella and may reduce the risk of herpes zoster [23]. Disease burden of varicella is substantial: as it was estimated in systematic literature review, without vaccination a total of 5.5 million cases would occur across Europe, majority of this infection would affect children < 5 years [24].

World Health Organization (WHO) recommends that in countries where chickenpox is an important public health burden, chickenpox vaccination should be introduced into their routine immunization programs [1]. In Libya, the decision for a vaccine to be included in the national immunization program is taken by the Ministry of Health, in consultation with an advisory board of The National Centre for Disease Control (NCDC) has given permission to start vaccinating children with the Chickenpox and Viral Hepatitis vaccines, starting from the beginning of March 2023. The centre published a circular addressed to the supervisors of the National Program for Vaccinations in municipalities on its Facebook page, in which it clarified that vaccinations are given to children at the age of 15 months, those born in December 2021 [25]. Previous studies have indicated that mothers play an important and critical role in protecting their children from acquiring and transmitting vaccine-preventable diseases through increasing the vaccination coverage [26]. The specific mechanism is that the knowledge and perception of the benefit of vaccination can influence mother's choice to immunize her children Furthermore, some studies demonstrated that pregnant women's knowledge and attitude regarding vaccination could have an early and positive influence on the practice of getting vaccinated [27-29]. A cross sectional survey carried out in Naples, Italy to examine the knowledge, the attitudes, and the behaviour regarding the varicella infection and its vaccination among parents, revealed that a sufficient level of knowledge about the varicella vaccination was a significant predicting factor for vaccination acceptance [30]. It has been reported that parental perception of the severity of the disease was one factor in determining the uptake rate of vaccination, together with information supplied by health professionals, in order to make an informed decision [31-33]. A study of parents' perceptions and attitudes specifically concerning varicella vaccine found that the mothers' job types, as well as sources of advice, are important factors in acceptance [34]. Several reported studies indicate the level of knowledge of the parents, parental income, and access to the vaccines, accurate information on vaccines and the education level of mothers played an important role in the acceptance of the vaccines [35,36]. The role of social media was also highlighted in a review exploring the characteristics of vaccine refusal of parents [37].

To the best of our knowledge, not much is known about the knowledge, perception and practice of Libyan mothers towards chickenpox vaccination in Libya. Therefore, the current study was aimed to ascertain the level of knowledge, perception and practice towards chickenpox infection and its vaccination among Libyan mothers and to find out the relationship of knowledge to some of related characteristics of the mothers and their children.

## METHODS

### *Study design and setting*

A cross sectional study was conducted, during July-2023 in a Albadri golden polyclinic were located in the east district of Tripoli- Libya; the respondents were recruited using a convenient sampling eligibility criterion included Libyan mothers of children under five years old who were coming for well-child or routine immunization visits. A written consent from the head manager of Albadri polyclinic in Tripoli was obtained, and informed verbal consent of mothers

who were present in the waiting room and invited to participate in the study, participants were interviewed face-to-face by a structured questionnaire was developed by the researcher, based on reviewing related literature [30,38]. It was written in a simple Arabic language; it contained four parts to assess the following:

Part one: A- socio-demographic characteristic for the studied mothers. It consists of closed ended questions such as age, education, job, numbers of family members, and multiple-choice questions about source of mother's information about chickenpox. B- Child characteristic data such as age, sex, and ranking of child.

Part two: Mothers knowledge regarding chickenpox disease. It includes mode of transmission, signs and symptoms, and vaccination which comprised of 10 questions with closed ending response (yes, no, don't know). The total score of questions was 10. The knowledge score was calculated by assigning score of "one" for correct response and "0" for wrong response for each of the 10 questions. If the total score was 7 and above it was interpreted as "good knowledge", score between 5 and 6 "average" and "poor" if less than 5.

Part three: Reported perception and practices of studied mother. It measured the perception of Libyan mothers of children under five years old about immunization, which comprised of 4 statements. First statement about mother perception of susceptibility of their child to infection, second statement about seriousness of chickenpox disease, third statement about effectiveness of vaccine, fourth statement was about safety of vaccine. Positive Statement as agree, negative Statement as Disagree or Neither agree nor disagree. For practice calculate the frequency and percentage for Yes, in future response and for No response.

### Statistical analysis

The statistical package for social sciences (SPSS) in version 26 was used to conduct the statistical analysis. Frequency and percentages were used to summarize the categorical variables. Mean and standard deviation or median with interquartile ranges were used to describe the quantitative variables as appropriate for their distribution type. Chi-square test, were used to examine for the bivariate association between the studies variables and Knowledge score with a level of significance for a P-value of less than 0.05.

## RESULTS

A total of two hundred and four Libyan mothers participated in the study and completed the answer of structured questionnaire. The mean age of the participant mothers was 32.06 ( $\pm 7.66$ ) years old. Approximately 65% of the mothers were educated in the universities. However, around (52%) of them are housewives. The socio-demographic characteristics of the participants are described in Table 1.

*Table 1. Characteristics of the mothers (n = 204).*

Characteristic	Statistical Parameter
Age in Years (mean, SD)	32.06 $\pm$ 7.66
Mother age (frequency, %)	
$\leq 20y$	6(2.94)
21-39y	160(78.43)
$\geq 40y$	38(18.63)
Education Level (frequency, %)	
Illiteracy	1(0.5)
Primary	4(2)
Preparatory	10(4.9)
Secondary	54(26.5)
University	131(64.2)
Postgraduate	2(1)
Occupation (frequency, %)	
Housewife	105(51.5)
Employee	67(32.8)
Teacher	27(13.2)
Number of children in the family	
$\leq 2$	98(48)
3-6	95(46.6)
$\geq 7$	11(5.4)

Table 2 shows the Sociodemographic characteristics of children that have been studied. (52.5%) of the enrolled children were males, with a mean age equal to 18.68(±18.02) years.

**Table 2. Children's Characteristics of the mothers (n = 204)**

Characteristic	Statistical Parameter
<b>Age in Years (mean, SD)</b>	18.68±18.02
<b>Child age (frequency, %)</b>	
≤12m	109(53.4)
13-24m	48(23.5)
25-36m	14(6.9)
37-48m	13(6.4)
≥49m	17(8.3)
<b>Gender of child</b>	
Male	107(52.5)
Female	97(47.5)
<b>Order of Child in Family (Median, IQR)</b>	(2 ± 2)
≤2	113(55.4)
3-6	82(40.2)
≥7	9(4.4)

The result of the present study reflected that (33.3%) of the Libyan mothers have a good knowledge, 41.7% with average knowledge and (25%) had poor knowledge about chickenpox and its vaccination. Furthermore, an immense number of the respondents had heard about chickenpox (95.6%). Most of them (84.8%) stated correctly about the transmission of chickenpox by direct contact and (46.6%) of them answered through inhalation of aerosolized droplets. Meanwhile, (84.3%) answered by no for the transmission via contaminated water and food. The majority were well aware of the signs and symptoms of the infection which included itching rashes (92.6%), blisters and red spots (94.6%). Despite the fact that (51%) of the respondents knew about chickenpox vaccination, only (43.1%) claimed to know the vaccine available in Libya, with of the respondents (78.4%) correctly indicating more than one dose of this vaccine to be fully vaccinated against chickenpox. Table 3 illustrates the knowledge of mothers towards chickenpox and its vaccination.

**Table 3. Knowledge of mothers towards chickenpox and its vaccination (n = 204)**

Knowledge Questions	Correct answer	Incorrect answer
<b>Have you ever heard of chickenpox</b>	195(95.6)	9(4.4)
<b>Chickenpox transmits via contaminated water and food</b>	172(84.3)	32(15.7)
<b>Chickenpox transmits via direct contact</b>	173(84.8)	31(15.2)
<b>Chickenpox transmits via inhalation of droplets</b>	95(46.6)	109(53.4)
<b>Chickenpox transmits via contaminated syringes</b>	145(71.1)	59(28.9)
<b>Itching rash is one of the symptoms of Chickenpox</b>	189(92.6)	15(7.4)
<b>Blisters and red spots are signs of Chickenpox</b>	193(94.6)	11(5.4)
<b>There is a vaccine against chickenpox</b>	105(51)	99 (48.5)
<b>The vaccine is available in Libya</b>	88(43.1)	116 (56.9)
<b>The child needs only one dose of this vaccine to be fully vaccinated against chickenpox</b>	160(78.4)	44(21.6)

The results as shown in Table 4 about the concerning perception was (81.4%) of the respondents had negative perception about their child might catch chickenpox, which indicate susceptibility of their children to have infection, whereas (80.9%) of respondents agree about their thinking that chickenpox is serious disease and only 12.3% respondents believed that vaccine was effective. Moreover, (77.9%) of respondents had negative perception about safety of vaccine. The results concerning practice indicated that approximately (80%) of the respondents had vaccinated or had intension for vaccination their children against chickenpox. Table 5 demonstrates the practice of mothers towards chickenpox vaccination.

**Table 4. Perception and concerns of mothers about chickenpox and its vaccination (n = 204)**

Perception Questions	Agree	Neither agree nor disagree
<b>My child might get chickenpox</b>	38(18.6)	166(81.4)
<b>I believe that chickenpox is serious disease</b>	165(80.9)	39(19.1)
<b>I think that varicella vaccination is useful</b>	25(12.3)	179(87.7)
<b>I believe that the varicella vaccine is safe</b>	45(22.1)	159(77.9)

**Table 5. Practice of mothers about chickenpox vaccination (n = 204)**

Practice	Now or in future yes	No
<b>Has your child been vaccinated against chickenpox?</b>	159(77.9)	45(22.1)

Friends and family form around 52% as a source of information about knowledge of chickenpox disease and its vaccination. By using bivariate analysis shows that occupation of mothers has a clear statistical significance and correlation with knowledge of varicella and its vaccination ( $p = 0.008$ ). Table 6 shows the bivariate analysis between knowledge and selected demographic characteristics. Our study shows practice of mothers about vaccinated their children have a clear statistical significance and correlation with their knowledge of varicella disease and its vaccination ( $p = 0.004$ ) but no association with their perception.

**Table 6. Bivariate association between knowledge and selected demographic characteristics (n=204)**

Knowledge about the chickenpox disease and it is vaccination							
characteristic	Poor		Average		Good		p-value
	F	%	F	%	F	%	
<b>Age of mothers (years)</b>							
○ ≤20 y	2	3.9%	2	2.4%	2	2.9%	0.689 <sup>C</sup>
○ 20-39 y	38	74.5%	65	76.5%	57	83.8%	
○ ≥ 40 y	11	21.6%	18	21.2%	9	13.2%	
<b>Education level of mothers</b>							
Illiterate	0	0.0%	0	0.0%	1	1.5%	0.335 <sup>C</sup>
Primary	3	5.9%	0	0.0%	1	1.5%	
Preparatory	4	7.8%	4	4.8%	2	3.0%	
Secondary	15	29.4%	24	28.6%	15	22.4%	
University	29	56.9%	55	65.5%	47	70.1%	
Post Graduate	0	0.0%	1	1.2%	1	1.5%	
<b>Occupation</b>							
Housewife	38	74.5%	36	43.9%	31	47.0%	0.008 <sup>C</sup>
Employee	10	19.6%	31	37.8%	26	39.4%	
Teacher	3	5.9%	15	18.3%	9	13.6%	
<b>Number of children</b>							
○ ≤ 2	28	54.9%	35	41.2%	35	51.5%	0.362 <sup>C</sup>
○ 3-6	19	37.3%	46	54.1%	30	44.1%	
○ ≥ 7	4	7.8%	4	4.7%	3	4.4%	
<b>Age of children (months)</b>							
○ ≤12	29	58.0%	38	45.2%	42	62.7%	0.238 <sup>C</sup>
○ 13-24	10	20.0%	24	28.6%	14	20.0%	
○ 25-36	3	6.0%	5	6.0%	6	9.0%	
○ 37-48	3	6.0%	6	7.1%	4	6.0%	
○ ≥ 49	5	10.0%	11	13.1%	1	1.5%	
<b>Gender of child</b>							
Male	30	58.8%	42	49.4%	35	51.5%	0.557 <sup>C</sup>
Female	21	41.2%	43	50.6%	33	48.5%	
<b>Birth order of the child</b>							
○ ≤2	34	66.7%	42	49.4%	37	54.4%	0.115 <sup>C</sup>
○ 3-6	13	25.5%	40	47.1%	29	42.6%	
○ ≥ 7	4	7.8%	3	3.5%	2	2.9%	

Sources of information about chickenpox vaccine						
○ Healthcare provider	19	38.8%	29	34.1%	18	26.5%
○ Friends/ family	27	55.1%	43	50.6%	36	52.9%
○ Internet	2	4.1%	7	8.2%	13	19.1%
○ Mass media	1	2%	6	7.1%	1	1.5%

<sup>C</sup>: Chi square test.  $P < 0.05$  is statistically significant.

## DISCUSSION

This study found that the overall knowledge among Libyan mothers was considerable, Even though they had also heard about chickenpox infection and they correctly mentioned the mode of transmission of the infection as well as the accompanying signs and symptoms it may be due to the studied mothers had high education level. Similar finding was reported in Nigeria study [39] but this finding was disagreement with study [42] who reported parents of children had poor knowledge. A sufficient level of knowledge about the varicella vaccination was significant Predicting factor for vaccination acceptance as in Italy study [30]. Previous studies showed that those with higher education were more likely to know the vaccination but our participants get little knowledge about the vaccine was available in Libya and some had poor knowledge about the doses for a complete vaccination process this similar with [38-40,41] studies were the knowledge about Varicella Vaccine availability and the number of dose was relatively poor, explanation for is that the latest schedule of Varicella Vaccine administration was a new recommendation issued in beginning of March 2023. The new recommendation needs sufficient time to get disseminated first among health care workers and the general population later. However, this raises concern for the need to properly educate on chickenpox vaccination for mothers who enroll for immunization of their children at health facilities.

We found that there is a strong significant correlation between the occupation of mothers and knowledge of varicella and its vaccination ( $p=0.0008$ ) which are consistent with the conclusion stated by Lisen Arnheim-Dahlström et al. [43] which they reported that among respondents who hold university degrees and respondents with a higher income were more likely to be aware of the varicella vaccine and to have vaccinated their child. Our study show that number of vaccinated children have a clear statistical significance and correlation with knowledge of mothers by varicella vaccine ( $p = 0.004$ ) which are consistent with the study in Egypt [38] and was disagreement with study in Singapore by Weisheng [44].

This study indicated that family or friends were the most frequently consulted information source on varicella and its vaccination by the participants, followed by the health care provider, which are consistent with study in Sweden [43] and in contrary to the study has been conducted in China [41] which indicated that the health care provider was the most frequently consulted information source on varicella and Varicella vaccination by the participants, followed by family or friends, and mass media. Since the health care providers have a significantly greater level of knowledge on vaccination compared with other non-professional information sources, the information delivered from a healthcare provider is effective. Educating Libyan women regarding the varicella and it is vaccination to acquire information. We suggest that health care providers should be aware of their role in communicating with women regarding Varicella vaccine. A remarkable finding of the study [45] is that the most important positive predictor for vaccination is the recommendation of the healthcare providers.

Our study show that the Perception of respondents was negative about susceptibility of their child to infection in contrary of china study [41] that the concern about infection by varicella was positive but perception towards causing serious health problems was positive in contrary of china study [41] towards causing serious health problems was negative, most of participants indicated that they did not believe varicella vaccination is effective in prevention of the disease consistent with study in Hungary [45] which report some parents have lost their trust in the vaccine: half of those parents, who vaccinated their first child, but not the next child(ren) did so because the first child got varicella in spite of vaccination. Our respondent had negative perception about safety of vaccine in in contrary of Germany study were parents who vaccinated their children believed that Varicella Vaccine was useful [46]. Efficiency of varicella vaccination has been evaluated in numerous studies [2]. Practice of mothers about vaccinated their children have no association with their perception may be there is other factor not included in our study or our sample power not enough these raises need to other study to demonstrating this factor.

## CONCLUSION

The current study indicated considerable knowledge levels and practice on varicella disease and it is vaccination were observed among Libyan mothers a majority of respondents would most likely vaccinate their children but had,

Negative perception towards chickenpox vaccination Addressing concerns regarding vaccine effectiveness, Safety and importance through educational campaigns would be important to further increase a high vaccine coverage rate, conducting a follow-up study would be valuable to demonstrate the factor effect the perception of Libyan mother and practices about varicella disease and it is vaccination.

### ***Ethical considerations***

All ethical consideration was issued; the purpose of the study was explained for each participant, they were also reassured that all information gathered would be in confidential manner and used only for the purpose of the study.

### ***Study limitation***

First the data obtained from only one primary health care center. Second this study was cross-sectional and the use of a non-probability sample, which limits the generalizability of its findings.

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### ***Conflict of Interest***

There are no financial, personal, or professional conflicts of interest to declare.

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## معرفة وإدراك وممارسة الأمهات الليبيات تجاه مرض جدري الماء (ابوشوكة) وتطعيمه، طرابلس – ليبيا

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### المستخلص

يعد الحماق (ابوشوكة) أحد الأمراض الفيروسية الأكثر شيوعاً والأكثر عدوى في مرحلة الطفولة، وقد ثبت أن استخدام اللقاح الوقائي للأطفال آمن وفعال في الحد من الإصابة والمرض المرتبطة به. هدفت هذه الدراسة إلى التأكد من مستوى المعرفة والإدراك والممارسة تجاه الإصابة بجدري الماء والتطعيم ضده ومدى إمكانية وجود علاقة مع بعض الخصائص لدى الأمهات واطفالهن. أجريت هذه الدراسة المقطعية على عينة من الأمهات الليبيات اللاتي ارتدن مستوصف البدرى بالناحية الشرقية لمدينة طرابلس. تم إجراء تحليل البيانات باستخدام الإصدار 26 من برنامج SPSS. شارك في الدراسة إجمالي 204 من الأمهات الليبيات اللاتي ارتدن مستوصف البدرى، وكان متوسط أعمارهن 32.06 (± 7.664) سنة. معظم المشاركين (95.6%) لديهم خلفية عن جدري الماء (أبوشوكة)، وكان (84%) منهم قد تكونت عنده فكرة صحيحة عن كيفية انتقاله. أما بالنسبة لاعراض وعلامات العدوى فكان أغلبهم على دراية تامة بها. وعلى الرغم من أن (51%) من المستجيبين لهذه الدراسة يعرفون عن تطعيم جدري الماء، إلا أن (43.1%) منهم فقط كانوا على دراية بتوفر اللقاح في ليبيا. كما أن (81.4%) من الأمهات كان لديهم تصور سلبي عن قابلية حدوث نتائج سلبية على أطفالهم بحيث يكون هذا التطعيم هو مصدر للعدوى بجدري الماء (ابوشوكة). ويعتقد حوالي (80.9%) من أفراد العينة أن جدري الماء (أبوشوكة) هو مرض خطير ومعدي وكان منهم (12.3%) يعتقد بأن اللقاح ذو فاعلية عالية، بينما (77.9%) منهم كان لديه تصور سلبي بشكل عام حول سلامة اللقاح. وأشارت النتائج المتعلقة بالمعرفة العملية عن اللقاح أن ما مجموعه (80%) من أفراد العينة كانوا بين من قام بالفعل بتطعيم طفله أو لديه رغبة في تطعيم طفله ضد مرض الجدر (ابوشوكة). أشارت الدراسة الحالية إلى وجود مستويات كبيرة من المعرفة والممارسة حول مرض الحماق والتطعيم ضده بين الأمهات الليبيات، مع معالجة المخاوف المتعلقة بفعالية اللقاح وسلامته وأهميته من خلال الحملات التثقيفية لضمان إعلام جميع الأمهات بتوفر لقاح الحماق وفوائده.

**الكلمات الدالة:** جدري الماء، لقاح الحماق، المعرفة، الإدراك