

A Conceptual Framework for Construction and Validation of an Educational Booklet for Treating mothers Misconceptions on vaccination

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Abstract

There is no exaggeration to assert that vaccination is one of the greatest scientific discoveries ever made. Generally, mothers' misconception of vaccination was considered as one of the major barriers for better immunization coverage. Previous studies showed misconceptions on mothers' knowledge towards childhood immunization. So, there is a necessity for the mothers to create unequivocal knowledge in order to develop positive attitude towards vaccination and thus improve their contribution to it for reducing the burden of dreadful infectious diseases. **Objective:** To develop and validate an educational booklet for treating mothers' misconceptions on vaccination. **Design:** A cross-sectional descriptive study design was adopted in this study for building and validating an educational booklet entitling "Treating mothers' misconceptions on vaccination." The construction of the booklet took place between June to December 2017 at Tanta district health offices through two stages: bibliographic survey; and manufacture of educational materials. Total sample size of 400 mothers of children under five years selected by using convenience sampling technique. Two-structured questionnaires were developed based on relevant literature and adopted throughout the study phases. The first one contained the following data: A) the first part included socio-demographic characteristics of the mothers as age, educational level, occupation, family size and residence. B) The second part included mothers' knowledge towards obligatory vaccination importance, contraindications, and side effects, in addition to all vaccines' mode, time and age of administration. C) The third part included mother's practical knowledge she followed before, during and after vaccinating her child. Moreover, the second questionnaire was used for exploring the mothers and professional experts' opinions in relation to formulation of an educational booklet. **Results:** The study results indicated that, Out of 400 mothers included in the study, the mean age of the mother whose child undergoing vaccination is (22.00 ± 10.68) years. The predominant mothers have completed higher education, and occupational status showed that more than two-third (68.3%) were house wives. Regarding mothers' knowledge level, The proportion of mothers who lack the knowledge were as follows; vaccination contraindication (86.3%), Side effects (60.8%), BCG (51.5%), Hepatitis B (87%), MMR (92.5%), OPV (54.8%) and PENTA (94.5%). **Conclusion:** It was crucial to construct this booklet to ensure children' mothers' better understanding of the issues surrounding vaccination, treating their misconceptions and for improving their potentials of management of their children' vaccination care.

Keywords: Educational booklet, Childhood vaccination, Children ' mothers, Validation.

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STUDY SIGNIFICANCE

What is already known about the topic?

- Vaccination is often cited as one of the most significant contributions of the medical fraternity to mankind. As well as, it is one of the most cost-effective child survival interventions which are practiced throughout the world [1]. All countries in the world have a vaccination program to deliver authorized vaccines to the targeted beneficiaries, specially focusing on infants and children, who are at one of the high risk groups for diseases

preventable by vaccines. However, this success has always been blocked by mothers' inadequate knowledge, ignorance, and misconceptions.

What this paper adds?

- This paper provides insight about mothers' general and practical knowledge scores toward their children's obligatory vaccination in Tanta district. In addition to construction, and validation of obligatory vaccination booklet for treating of their misconceptions regarding obligatory vaccination.

INTRODUCTION

Childhood vaccination almost guarantees protection from many major diseases. It prevents 2-3 million deaths among children less than 5 years old yearly worldwide [2]. It is not only crucial for the health of children but also for the wider community. To achieve the highest benefit of vaccination, adequate number of population must be vaccinated to cease the spread of the causative microorganisms of the most widespread childhood disease. In addition to develop the highest important phenomenon called 'herd immunity' which is primary and major outcome of massive vaccination activities [3].

The mother plays a major role in promoting the health of children. Several misunderstandings, ignorance and inadequacies of knowledge in relation to obligatory vaccines are prevalent among mothers especially under five children [4]. Mothers' practices for dealing with side effects, negative perceptions in mild illness, negative attitude and mother's misconception about vaccination were considered as some major barrier to childhood vaccination [5]. So, there is a necessity for the mothers to develop unequivocal knowledge and perceptions about vaccinations. As, it helps to reduce the burden of dreadful infectious diseases, which are best controlled by vaccination and so on raise overall vaccination coverage [6, 7].

As the vaccinator, the nursing professional has the opportunity to act as an educator at the time of the vaccination, transmitting fundamental information referent to the prevention of illnesses, contributing to the families perceiving the value of immunization, defined as a method capable of avoiding illnesses [8]. In addition to this, in order for the children's mothers to have knowledge about the importance of vaccination, it is necessary for the nursing professional working in the vaccination room to be fully-informed regarding vaccination, as knowledge in the area of health care improves daily practice [9]. Many studies undertaken on the child vaccination situation, however, most of them revealed that there were the shortcomings of knowledge and of communication between the health services and the service users [10].

Globally, national and international health agencies recommend that primary health care should adopt educational strategies and offer children's mothers guidance on a vaccination care, in order to improve satisfaction rate and so on coverage rate [11].

The traditional Vaccine Information Statements (VIS), which providers are required by law to provide to parents (National Childhood Vaccine Injury Act of 1986), have been criticized for their high reading level and for containing insufficient information. Therefore, efforts have been made to evaluate additional informational materials to supplement VIS [12]. The current standard of care is to provide written materials including VIS at each vaccination visit, but fewer paediatricians and family practitioners routinely provide these written materials during immunization visit [13, 14]. In the highlight of what have been mentioned before, the present study was conducted to construct health educational booklet in the field of childhood vaccination to be used as a tool for assuring more knowledge gain, and probably enhance retention.

SUBJECT AND METHODS

Study design

The study design was determined to be cross-sectional descriptive study, which was used for surveying the children' mothers' general and practical knowledge regarding obligatory childhood vaccination importance, contraindication, side effects, and its management ...etc. professional experts and mothers' feedback were also explored for completing validation stage of the constructed booklet before developing the final draft.

Setting

The study conducted at six primary healthcare facilities of Tanta district. These primary facilities were selected according to their population density as it serves large number of children as indicated in table (1).

Subjects and sampling

The study subjects included two samples to represent the target group of the constructed booklet; the target group was core beneficiaries of the developed booklet who were the mothers of children under five years who came to primary health care centers for vaccinating their children. As well as, pediatric and community experts were the evaluators for the validation stage of the booklet. Convenient sampling technique was used to select the sample involved in both preliminary assessment stage, and evaluation stage of the intended booklet.

Children's mothers

The actual numbers of children's mothers recruited in the study were (400) mothers who were selected from 6 high population density primary health care facilities as shown in table (1).

Table-1: Distribution of the recruited mothers from Tanta district primary health care facilities (N =400)

PHC facilities	Actual sample size
1. Health office – Tanta 1	35
2. Health office – Tanta 2	25
3. Health office – Tanta 3	82
4. Health office – Tanta 4	40
5. Health office – Tanta 5 (intersection of Botros)	115
6. Health office – Tanta 6 (Ciggar village)	103
Total studied mothers sample size	400

Professional experts and Mothers' feedback post development

Forty- four mothers and professional academic experts agreed to provide their feedback about the developed booklet; twenty-two for each group. This number of evaluators was sufficient to provide a feedback for content validity of the obligatory childhood vaccination booklet in accordance with the equation for finite populations $n = Za^2.P (1-P)/e^2$. In this equation, Za (confidence level) was stipulated in 95%, P (proportion of experts agreeing with the item) was set at 85% and "e" (expected difference) was 15%, so that the calculated sample was 22 participants for each group [15].

Process of booklet construction and validation

Among the various approaches for constructing health educational materials, this study used Echer's methodology [16], which clarifies the approach of developing teaching materials for health care. Several studies related to the construction of educational materials followed these assumptions [17, 18]. For this study, we adopted the following stages: bibliographic survey and preparation of educational materials.

Bibliographic survey stage

The Preliminary survey was concerned about assessing children' mothers' general and practical knowledge regarding obligatory vaccination. During this stage, it was important to figure out opinions of professional experts in relation to the structure, and content of the intended booklet.

DATA COLLECTION TOOLS

Two tools were included in conducting the preliminary assessment. The first tool composed of three parts A) "*Self-administrated Socio-demographic characteristics part.*" This part was used to assess socio-demographic characteristics of children's mothers such as age, sex, education, occupation, and family size. The second part was "*Self-administered general*

knowledge assessment part" that was designed to test mothers' general knowledge with 38 knowledge items, which required true, or false answers relating to diseases controlled by obligatory vaccination, importance, contraindication, and vaccination schedule with routes and doses. C) "*Self-administered practical knowledge assessment part*" that was developed to test mothers' practical knowledge with 18 knowledge items regarding management of vaccination care. Correct answer scored= (1), while an incorrect answer scored = (0).The total knowledge score was categorized into three levels as stated by Ramadan *et al.* [19]. The knowledge scores categories were a poor score = less than 50% of the total score, a fair score = 50 to 65% of the total score, and a good score = more than 65 % of the total score. The second tool was "*Structured self-administered feedback questionnaire of Children's mothers and professional experts about criteria of the constructed booklet.*" This questionnaire was used to explore the Children's mothers and professional experts' opinions concerning structure and content of the constructed booklet.

Reliability of the questionnaires

Internal consistency reliability (Cronbach's α) for the first questionnaire emerged as high (0.758–0.922).For and each domain, A) socio-demographic part (Cronbach's $\alpha = 0.758$), B) general knowledge part (Cronbach's $\alpha = 0.922$) and, C) practical knowledge part (Cronbach's $\alpha = 0.831$).

For the second questionnaire: emerged as high (0.719-0.725). For and each domain, A) expert ' feedback part (Cronbach's $\alpha = 0.725$), and B) nurses ' feedback part (Cronbach's $\alpha = 0.719$).

Preparation of the health educational booklet

According to Reberte *et al.* [20], the preparation stage of the intended booklet composed of six steps as shown in (Figure 1), carried out in the period from June to December 2017.

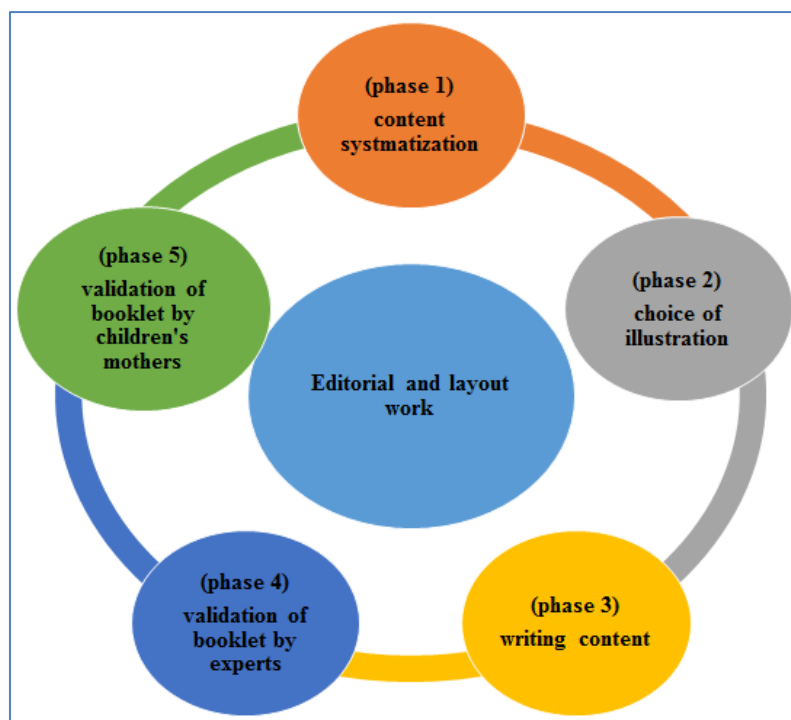


Fig-1: The preparation stage of the health educational booklet

Development phase of the health educational booklet

- According to the primary situational analysis results, which indicated lack of adequate general and practical knowledge of children's mothers, in addition to the reviewed literatures, this educational booklet were developed.
- The intended protocol was appraised for its content validity by obtaining experts and children's mothers' feedback. The feedback was obtained by the second tool, which concerned with the booklet structure, content, and its illustrations form. The initial draft of the constructed booklet was disseminated to 22 experts and 22 children's mothers to test content validity of the booklet. Any specific comments and recommended modifications from experts' evaluation were documented and considered in the formulation process of the final booklet draft.

Official, ethical and other technical issues

- Ethical approval was obtained from the research ethics committee that affiliated to the Faculty of Nursing- Tanta University. Oral consents were obtained from children's mothers to participate in the study after illustrating the purpose of it. The collected data is considered confidential and kept in a closed cabinet for 5 years and reached only by the research team only [11, 22].
- An official approval from the dean of Faculty of Nursing- Tanta University and the vice dean for higher graduate studies was submitted to MOHP Directorate to obtain approval for conducting the study at the selected primary healthcare facilities.

- The content validity of the developed tools was tested by five experts of pediatric nursing. In addition to, a pilot study that was conducted on 10 % of mothers (40 mothers) who were selected randomly from different Tanta district health offices and were not included from the studied sample. The pilot study aimed to evaluate the clarity and applicability of the research tools in addition to, estimation the approximate time required for data collection. Accordingly, the necessary modification was done, some questions were added, and others were clarified or omitted.

STATISTICAL ANALYSIS

Statistics in the form of simple frequency tables for nominal and categorical variables and arithmetic mean \pm standard deviation for continuous variables were calculated after analyzing data by SPSS (Stand for Statistical Productive and Service Solution) version 20.

RESULT

Results divided into three parts; firstly, the results of pre-booklet construction (needs assessment). Secondly, description of the constructed content, and finally, the booklet content validation.

Preliminary assessment

Table (2) indicates that 67.2 % of respondents were between 18->28 years with mean age of 22.00 ± 10.68 years old. Concerning educational level, 39.2 % of them have bachelor degree. Regarding marital status, 83.5% of them were married and live in rural areas. As regarding their occupation, 68.3% of them were house

wives. As shown in the figure (2), nearly the highest percent of respondents acquire their vaccination knowledge from PHC facility and preferred the booklet as the most convenient health educational material. The

table also reveals husband characteristics. For husband education, 26.5% of husbands were only primary level. Finally, regarding husband occupation, 35.8% of them were the clerks.

Table-2: Distribution of the studied mothers according to their socio-demographic characteristics (N=400)

Socio-demographic characteristics	N=(400)	%
Age		
18- >28	269	67.2
28- >39	131	32.8
$\bar{x} \pm SD$	22.00 \pm 10.68	
Education		
Illiterate	81	20.3
Read and write & primary	35	8.7
Secondary	127	31.8
Bachelor degree	157	39.2
Marital status		
Married	334	83.5
Not married	66	16.5
Preferred health education materials		
Books	57	14.3
Booklets	157	39.3
Posters	28	7.0
brochures	73	18.3
Information messages	85	21.3
Occupation		
House wife	273	68.3
Worker	23	5.8
Clerk	66	16.5
Other	38	9.5
Residence		
Urban	66	16.5
Rural	334	83.5
Number of family member		
3-5	338	84.5
> 5	62	15.5
Education of husband		
Illiterate	66	16.5
Read and write & primary	106	26.5
Secondary	87	21.8
Institute	58	14.5
Bachelor degree	83	20.7
Occupation of the husband		
Not worked	65	16.3
Clerk	143	35.8
Free work	121	30.3
Other jobs	71	17.8

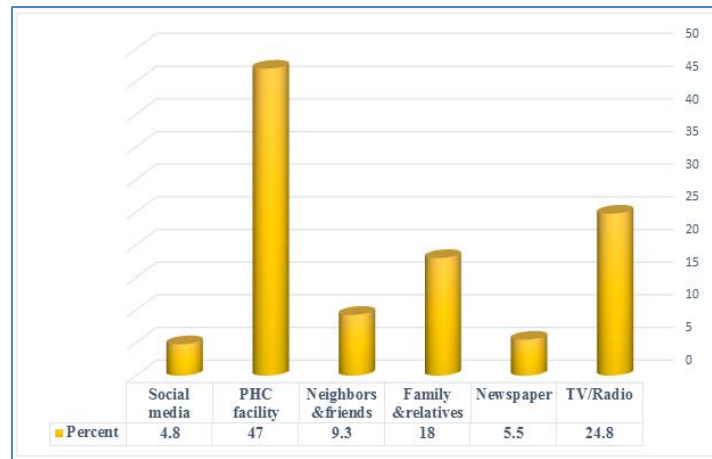


Fig-2: Mothers' vaccination knowledge sources

***Multiple responses**

Table (3) reveals that more than half of the respondents could not identify number of doses, mode, and age of BCG and OPV administration. As well as,

less than one-sixth of them choose number of doses, mode, and disease controlled by vaccine and age of administration in relation to MMR, Hepatitis B, PENTA vaccines correctly.

Table-3: Distribution of the studied mothers according to their knowledge about childhood vaccines

Items	N=(400)	%
BCG vaccine		
Disease controlled by the vaccine	202	50.5
Number of doses	194	48.5
Mode of administration	186	46.5
Age of child at administration	194	48.5
OPV vaccine		
Disease controlled by the vaccine	181	45.3
Number of doses	166	41.5
Mode of administration	219	54.8
Age of child at administration	181	45.3
Hepatitis B vaccine		
Disease controlled by the vaccine	47	11.8
Number of doses	52	13
Mode of administration	41	10.3
Age of child at administration	52	13
MMR vaccine		
Disease controlled by the vaccine	36	9
Number of doses	30	7.5
Mode of administration	22	5.5
Age of child at administration	30	7.5
PENTA vaccine		
Disease controlled by the vaccine	28	7
Number of doses	22	5.5
Mode of administration	22	5.5
Age of child at administration	22	5.5

Table (4) shows less than three-fourth (70.3%) of the respondents stated importance of vaccination as protection from infectious diseases, improvement of immune system and enjoying good health. Concerning side effects of vaccination, the respondents correct

responses as the follow; 84.8% for " Pain at site of injection," 71.3% for " Redness and swelling," 62.5% for" Fever up to 39," and 42% for " Appearance of bullae at the site of BCG injection." As regarding to vaccination contraindication, less than one-sixth of

them choose Allergy to vaccine, diarrheal disease, family history of immunosuppressive disorders and AIDS as true vaccination contraindications, as well as, 64.8% of respondents stated chemotherapy and radiotherapy as major barriers for vaccinating their

children. In accordance with total mother' general knowledge, 83.8% of them showed poor score of knowledge with mean 11.93 ±8.18 points as shown in Figure (3).

Table-4: Distribution of the studied mothers according to their knowledge about childhood vaccination importance, contraindication and its side effects

Items	N=(400)	%
Importance of vaccination*		
Protection from infectious diseases	241	60.3
Improvement of immune system	235	58.8
Enjoying good health	281	70.3
All of above	281	70.3
Side effects of vaccination		
Pain at site of injection	339	84.8
Redness and swelling	285	71.3
Fever up to 39	250	62.5
Appearance of bullae at the site of BCG injection	168	42
Paralytic poliomyelitis	53	13.3
Convulsions	34	8.5
Rash	61	15.3
Contraindications of vaccination		
Allergy to vaccine	63	15.8
Allergy to vaccine components	58	14.5
Treatment with immune-suppressive drugs	59	14.8
Chemotherapy and radiotherapy	259	64.8
Moderate and severe diarrheal disease	55	13.8
Family history of immunosuppressive disorders	69	17.3
AIDS children	55	13.8

* Multiple responses

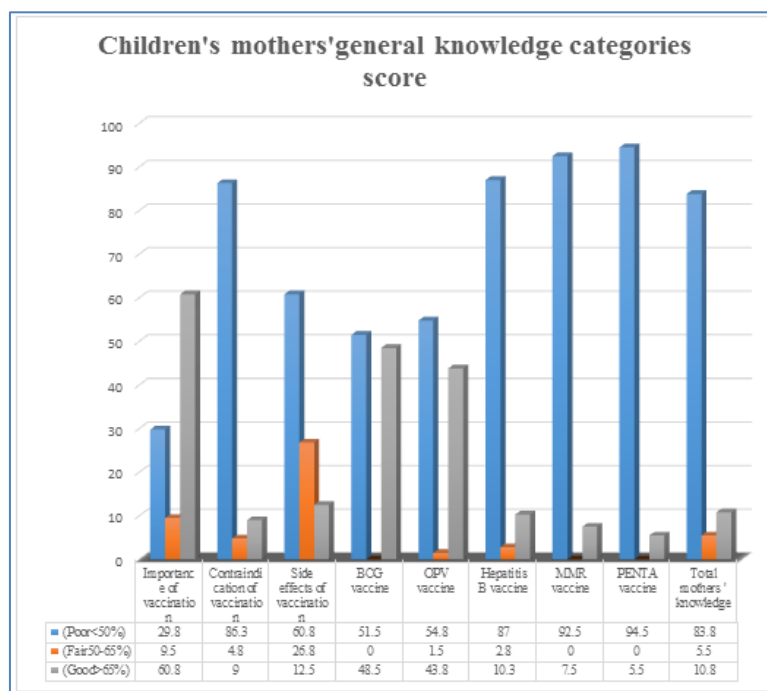


Fig-3: Children's mothers' general knowledge categories score

Table (5) illustrates that most of the respondents (94.3%) were bringing their child's vaccination card. As well as, three-fourth of them was dressing their children suitable clothes for vaccine administration. In relation to child's attention distraction, half of the respondents talk to their children and using toys as methods of distraction. Concerning mothers' practical knowledge after vaccination, less than half of respondents (44%) has satisfactory

knowledge regarding management of post vaccination swelling. As regarding for post vaccination fever, more than half of respondents (54.5%) demonstrated appropriate management of post vaccination fever. In accordance with total mothers' practical knowledge, two-third of respondents showed poor level of practical knowledge with 7.33 ± 2.85 points as shown in figure(4).

Table-5: Distribution of the studied mothers according to their practical knowledge before, during and after vaccinating their children

Item	N=(400)	%
Mothers' practical knowledge before vaccinating their children:		
Bring child's vaccination card	377	94.3
In case of sickness, the child 'mother should bring all the prescribed medication	157	39.3
Report the previous vaccinations side effects	99	24.8
Dressing your child suitable clothes for vaccine administration	299	74.8
Distracting child ' attention by:		
Talking to him/her	220	55
Using toys	162	40.5
Giving two drops of glucose solution	60	15
Mothers' practical knowledge during vaccinating their children:		
Cuddle your child during vaccination	299	74.8
Distracting child ' attention during vaccination by the previous measures	63	15.8
Mothers' practical knowledge after vaccinating their children:		
lactate your child after vaccine administration	127	31.8
Appropriate management of swelling		
Cold compress	176	44
Starch	69	17.3
Analgesic and local anti-inflammatory	100	25
Appropriate management of fever		
Inform your doctor in case fever up to 39	33	8.3
Give the prescribed antipyretic (parastmole)	217	54.3
Avoid giving acetylsalicylic acid (aspirin or aspicid)	80	20
Apply cold compresses at the site of administration	218	54.5
Dress child light clothes	178	44.5

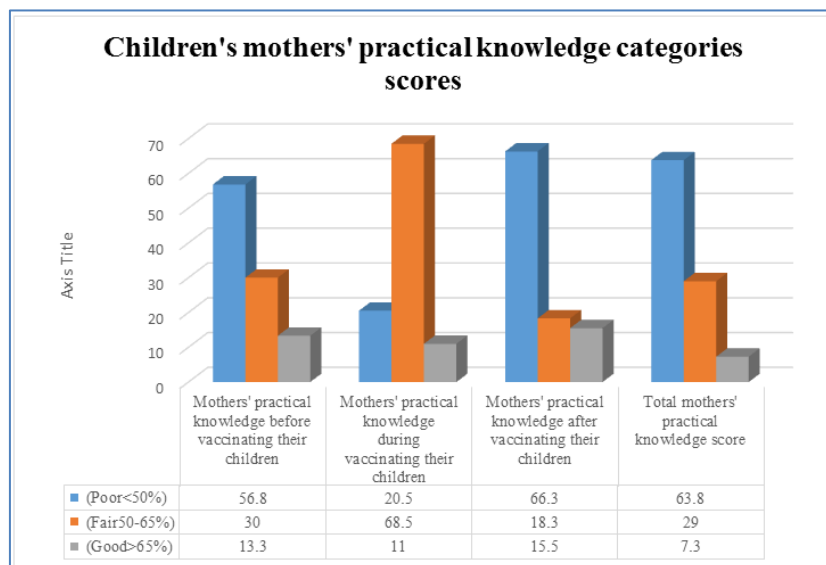


Fig-4: Children's practical knowledge categories score

Box (1): Description of the constructed health education booklet

Components	Description
Language	Arabic version
Introduction	Highlight on: Importance of obligatory childhood vaccination for under five children
Content	
Importance of vaccination for children	This section describes the benefits of vaccination for under five children which are protection from the most virulent childhood infectious disease.
Side effects of vaccination	This section provides instructions on vaccination side effects and how to manage these post-vaccination reactions.
Schedule of obligatory vaccination	This section illustrates information about name of each vaccine dose, time and rout of administration.
Diseases that controlled by vaccination	This section describes the diseases controlled by vaccination; its causative agents, mode of transmission, incubation period, clinical features and its complication.
True and false vaccination contraindications	This section provides illustrations about real and pseudo contraindications for childhood vaccination for correcting any misunderstanding about it.
Role of mother before vaccination	This section demonstrates the mother' role before vaccinating their children; what she should take in her considerations and do before going for vaccination.
Role of mother during vaccination	This section demonstrates the mother' role during vaccinating their children; what she should perform during vaccination session.
Role of mother after vaccination	This section demonstrates the mother' role after vaccinating their children; how she can manage post vaccination side effects.

Evaluation of content validity

Table (6) reveals that most experts and mothers (95.5%) mentioned that the topic of the constructed booklet is significant for the target population. Regarding the booklet's objectives, (95.5%) of experts and mothers agreed on the objectives are specific, achievable, measurable, and reliable and time bounded. In relation to the content, 81.8% of experts and 90.9% of mothers stated that the booklet content is sufficient to achieve the objectives and matched to the

native culture. Furthermore, majority of experts and most of the mothers mentioned that the material vocabulary is composed of popular words, and sequence of information is consistent, making it easier for the readers to predict its flow. Most of the experts and all mothers mentioned that the booklet legibility and printing characteristics are suitable. Moreover, the used media are obvious and grasp attention. In conclusion, total experts' and nurses evaluation regarding the developed booklet material is good.

Table-6: Distribution of professional experts' and children' mothers according to their feedback about the constructed booklet (N=22)

Evaluation items	children' mothers' feedback N= (22)		Experts' feedback N= (22)	
	N	%	N	%
Topic				
The topic of educational booklet is significant	21	95.5	21	95.5
Objectives and contents				
The objectives are SMART	21	95.5	21	95.5
Content is sufficient to achieve the objectives.	20	90.9	18	81.8
Content is updated	20	90.9	16	72.7
Content is matched to the native culture	19	86.4	18	81.8
Content is concise	18	81.8	21	95.5
Literary Presentation				
Majority of the vocabulary is composed of popular words	20	90.9	19	86.4
Planning and sequence of information are consistent, making it easier for the readers to predict its flow.	21	95.5	18	81.8
Legibility and printing characteristics				
Size and style of the letters are suitable	22	100	20	90.9
The space between lines and paragraphs are suitable.	22	100	20	90.9
Length of the paragraphs is proper	20	90.9	21	95.5
Use of bold characters and bullet points draw attention to specific points or key content	21	95.5	20	90.9
The used media				
The media is appropriate to the content delivered	22	100	20	90.9
The used media is grasping attention	22	100	21	95.5
The used media is obvious	22	100	21	95.5
Total evaluation score	21	94.2	20	89.4
• Good				

DISCUSSION

Educational materials play an important role in the process of health education, as they not only facilitate the mediation of the learning content, but also function as a resource readily available so that clients and their families can refer to it when faced with uncertainty in the development of care. It is noteworthy that the increasing use of educational materials as resources in health education has assumed an important role in the teaching-learning process, especially in the care management of major public concerns [23]. Therefore, the current study aimed at constructing an educational booklet about vaccination for correcting mothers' misunderstanding about it. Prior to the development of this booklet, it was important to explore children mothers' general and practical knowledge regarding the obligatory vaccination.

In accordance with Socio-demographic characteristics of the studied mothers which consisted of 400 mothers ranged from 18- >28 years, with Mean \pm SD 22.00 \pm 10.68 years. The present study referred that nearly two-third of the mothers had Bachelor degree, majority of them were married and house wives. These findings are in the same line with interpretations of many conducted studies of that were implemented in Egypt, Nigeria, India, Saudi Arabia and Enugu [24, 25, 26, 27]. These studies revealed the same findings of the present study in relation to Scio-demographic characteristics as age, marital status, and occupation and qualification level. Also concerning mean age of the studied mothers, it was 22 years old which is similar to Mugada *et al.* [38] study who revealed that the mean age of his studied sample was 22 years old. As regarding to the studied mothers' occupation and marital status, the present study revealed that the large percent of them (68.3 %) were house wife and (83.5 %) of them were married which is consistent with Ramadan *et al.* [19].

In relation to mothers' vaccination source of information, this study concluded that the large percent of mother gain their vaccination information from PHC clinics which is observed in a study carried out in Oyo state by Adeyinka [29] who reported the most common source of information was also at the antenatal clinics (65.7%). This is, however, disagreeing with studies carried out in Karachi Pakistan, North India, Saudi Arabia and Bangladesh where 62.2%, 52.0%, 88%, 77%, and 80.18% of the respondents, respectively stated that the commonest source of information about the immunization of under-five children was through health workers at other hospital visits other than antenatal clinics [30-33].

To construct the intended health educational booklet throughout the present study, it was necessitated to survey mothers' general and practical knowledge regarding all sides of childhood vaccination before building the last version of the intended booklet.

Concerning the total mothers' general knowledge level, the current study indicated that (83.8%) of mothers showed poor general knowledge score. This interpretation may be due to insufficiency of educational interventions (training programs, seminars, conferences, and workshops) that are directed for raising mothers' awareness about their children vaccination. The findings of the current study were similar to many conducted studies; the first one was conducted by [34], in Saudi Arabia, who reported that mothers' knowledge about EPI vaccination was quite low. As well as, similar studies done in Pakistan and India, have also reported that the same finding in relation to the level of knowledge [30, 1, 34]. On the opposite side, there are many studies contradict this finding, as those implemented by [36, 37, 38, 39] who reported that good knowledge, positive attitude and good practice of the mothers towards childhood immunizations.

The mothers' efficient practice is essential contributing factor for success of national childhood vaccination programs. Therefore, it was crucial to evaluate mothers' practical knowledge. The present study indicated that deficiency of practical knowledge among the studied sample, which is alarming for rapid corrective intervention. In the same respect, many studies report the same results, lack of adequate practical knowledge [40]. In the other line, it is incompatible with many studies all over the world. The first one was developed by Siddiqui *et al.* [41] in India, which concluded 57.97% of the study population was found to have adequate knowledge-practice scores. Moreover, other studies were conducted by [42, 27, 37, 38, 39] who reported that the practice of majority of the studied mothers towards vaccination is satisfactory.

Educational interventions designed for mothers can have significant participation for raising vaccination uptake. Educating low-literate mothers by using pictorial messages and very simple language improved the completion vaccine uptake by 39% [43]. Based on this implication, the researcher constructed the intended health educational booklet for correcting mothers' misconceptions about vaccination. The developed booklet was validated by professional experts and mothers of children less than five years who mentioned that all information was accurate, the content is sufficient to achieve the objectives, appropriate to the level of understanding, updated, concise, and written in a mothers' oriented style. This finding is observed in the study conducted by Friedman [9] who reported the same evaluation. More ever, there are three other congruent studies conducted in different world regions. As in Germany, a study has showed that using balanced health information leaflets can increase girls' and parents' knowledge of the human papillomavirus vaccination and vaccination uptake [44]. As well as, Gross *et al.* [45] reported that an increase in college females' intent to vaccinate by nearly threefold after

displaying a 20-minute educational presentation about human papillomavirus vaccination. Lastly, the third study of Barrera *et al.* [46] indicated that parents in Guatemala repeatedly revealed that workshops at the community level is the best way to increase their awareness and knowledge of vaccinations.

CONCLUSION

It was crucial to construct this booklet to ensure children' mothers' better understanding of the issues surrounding vaccination, treating their misconceptions and for improving their potentials of management of their children' vaccination care.

RECOMMENDATIONS

- Comparable studies can be conducted on large sample for a longer period of time to be generalized on total population.
- Comparable studies can be conducted in different settings.
- Other special educational interventions should be implemented on large scale for raising mothers' awareness on vaccination.

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