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Knowledge & Awareness of Measles among Foreign Workers Screened for Employment in Qatar

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Abstract

Background: Measles is still of an enormous global concern from preventive perspectives. The importance of knowledge & awareness level about it is not negotiable.

Objective: To assess knowledge and awareness about measles, clarify the history of measles and its vaccine, and calculate the awareness level score among newly recruited workers in Qatar.

Method: A cross-sectional study was used. A total of 422 workers attending the medical commission were studied. An interview administered questionnaire and awareness level score was calculated.

Results: It was determined that (66.4%) of participants who know measles demonstrated an average level of measles awareness, while (22.4%) had an above-average level of awareness. Among those participants who know measles, most of them (81.8%) are aware of the existence of the measles vaccine, and (44.3%) gave a history of taking it. The majority were unaware of measles mode of transmission or preventive measures, except that (61.1%) know that its vaccine is protective. Most study participants (92.7%) have access to health information, and (84.4%) accept to take the vaccine if offered.

Conclusion: These findings demonstrate the importance of delivering the proper health information to this subgroup, educating these workers about measles mode of transmission and preventive measures through multi-lingual, informative, and straightforward messages using different tools irrespective of their measles awareness status.

Keywords: Knowledge; Awareness; Workers; Measles; Screening; Vaccination; Awareness level score; Qatar

Abbreviations: CRS: Congenital Rubella Syndrome; EMR: Eastern Mediterranean Region; EPI: Expanded Program on Immunization; GCC: Gulf Cooperation Council; HMC: Hamad Medical Corporation; IRB: Institutional Review Board; MC: Medical Commission; MMR: Measles, Mumps and Rubella; MOPH: Ministry of Public Health; PHCC: Primary Health Care Corporation; PI: Principle Investigator; SES: Socioeconomic Status Score; WHO: World Health Organization

Introduction

Measles has a major global public health importance as it can lead to serious illness or even death, although being preventable through a safe and a cost-effective vaccine. The World Health Organization (WHO) estimated that about (85%) of the world's children received one dose of measles vaccine by their first birthday through routine health services [1]. In 2012, the WHO's measles and rubella initiative launched a Global Measles and Rubella Strategic Plan which provides strategies to achieve from 2015 to 2020 measles & rubella control and elimination goals [2]. Goals by the end of 2015 was to achieve regional measles & rubella/

Congenital Rubella Syndrome (CRS) elimination, which was later extended till 2020 to achieve elimination in at least five WHO regions, including the Eastern Mediterranean Region (EMR) [3].

The population in Qatar is considered of a unique structure where foreign workforce contributes to more than (70%) of the total population [4]. Nevertheless, construction employers in Qatar principally attracts people from Southeast Asia, the Indian subcontinent, the Arab world, and some African countries [5]. Some of these countries are known to contribute to the global measles morbidity and mortality, and possibly add to the liability of measles importation to Qatar [1]. Review of the communicable diseases surveillance data in Qatar collected by the Ministry of Public Health (MOPH) during (2013) showed that many confirmed measles cases were among young and middle aged non-Qatari adults, usually referred to as foreign workforce. The (2013) data revealed (61) total confirmed measles cases, (36.1%) of them are males, (63.9%) are non-Qatari, and (29.5%) belong to age group (20-44) years [6].

By the local regulations, all workers are invited for an obligatory medical examination in the national's Medical Commission (MC) operated by MOPH. Clearance from the MC is mandatory to acquire an official work permission in Qatar.

The knowledge & awareness about measles and its related vaccination history are well-recognized factors that limit the measles outbreaks. Knowledge and awareness regarding measles is the product of multiple inputs of information in a more accumulative manner, which subsequently end to subjective judgment. Knowledge and awareness play a significant role in an individual's response to its immunization, preventive measures, and disease confrontation [7,8].

Medical literature focuses more on studying the knowledge and awareness among the parents or the health care workers rather than workers coming originally from high prevalence countries [9,10]. This is the first study to assess the knowledge & awareness under the background of vaccination status about measles in Qatar among foreign workers.

Aim and Objective

Assessment of the knowledge & awareness about measles is fundamentally vital for the health promotion and prevention programs in Qatar toward forging workers. Study objectives are:

To assess knowledge and awareness about measles, among newly recruited workers in Qatar. Further, to clarify the history of measles and its vaccine among these workers. Also, to calculate the awareness level score for measles among these workers.

Methods

Study Settings and Design

Cross-sectional study design was conducted at the MC in Doha-Qatar. It is an independent department under the MOPH; it consists of the administrative, medical, laboratory, and radiology units. It is a common pathway where all foreign workers before getting the work permit are obligatorily screened against a group of respiratory and blood-borne agents.

Study Population

All the calculated sample size of newly recruited workers attending MC for employment screening during the study period. On a daily average (2000-2500), applicants tested per day.

Eligibility criteria were both genders, aged between (18 and 60) years, applying for the MC examination to get a work permit in Qatar and willing to participate. The exclusion criteria were applicants for other reasons rather than getting the work permit (e.g., study residency permit and extension of travel or visit visas) and declined participation.

Sample Size and Sampling Technique

The following equation was used [11]:

$n = [Z^2\ 1\text{-}\alpha / 2 \times P \times (1\text{-}P)] / d^2$

Where n: sample size, Z = Z statistic for an α error of (0.05) corresponding to a (95%) confidence level (1.96), P: the prevalence estimated for measles sero-susceptibility (50%), and the d: error rate of (0.05). The calculated sample was (384). For compensation of the non-response or any missing data, a (20%) new number was added, and the final total sample became (460). A systematic random sampling technique was employed to recruit study participants. Participants were enrolled through communication with the authorized local administrator who provided lists of served applicants, routinely recorded. The first participant enrolled every day was chosen randomly, followed by the next one systematically every other (88) new applicant till the end of the working day. This systematic sequence was determined after calculating the required time to accomplish each interview. Subsequently, the number of interviews can be accomplished during the working hours, taking into consideration the average daily applicants visiting the MC. Participants were enrolled until the fulfilment of the calculated sample size. Fieldwork took the period from November (2014) until the end of January (2015).

The manager of the MC was contacted officially by the investigator before data collection. He was informed about the study's objectives and importance, and he aided and facilitated contact with the working team.

Research Instruments

The questionnaire was developed by The Principle Investigator (PI). It included information about the followings:

Socio-demographic

Data including gender, age, nationality, marital status, educational level, proposed job, and income in the home country.

Access to health care and information about measles

Answers were categorized into four groups (private healthcare facilities, health insurance, free governmental health services, and finally, the absence of a regular healthcare provider). While, access to health information, was categorized into two main groups (either no access or presence of access). Among those got access; the source was categorized into three main groups: printed materials (i.e., books, posters, booklets, etc.) and audio-visual messages (i.e., through T.V. and/or radio), and finally the internet. Responses to this section were designed not to be mutually exclusive.

Measles knowledge & awareness, history, and vaccination questions

Participants were asked if they knew what measles is; responses were either one of two categories; they had ever heard about measles or not. According to the response to this question, participants were either asked all questions (if they ever heard about measles) or asked non-measles specific questions [12-14].

Question about measles modes of transmission, categorical variable, six choices: (airborne, proximity as in hugging and kissing, aerosol droplets as in coughing and sneezing, indirect transmission through contaminated surfaces, skin contact, and/or blood contact), participants can choose more than one answer or chose to declare is not sure.

Measles recorded history; it includes questions about the history of acquiring measles (answer could be yes, no or not sure), recall of common symptoms (five categories: fever, rash, cough, running nose, and/or red eye), history of any fever with rash incidence and/or hospitalization related to it, if any (answer could be yes, no or not sure).

Question about measles prevention measures; categorical variable with seven choices demonstrate direct, indirect transmission modes, uncommon or wrong measures, include avoiding (airborne transmission, proximity as in hugging and kissing, indirect transmission through contaminated surfaces, skin contact and/or blood contact, and taking the specific anti-measles vaccine).

Measles vaccine-related history: the following questions were asked (knowledge about the presence of measles vaccine, intake of the vaccine, and if the participant did not take the vaccine; his/her explanation was recorded in one of four possible categories. Also; the place of vaccination, it's timing (written in months and years or since childhood, later were categorized according to the most frequent duration into two options, less than two years / 2 years or more or during childhood), personal opinion about its benefit and the reason for taking it). All the responses are categorical variables.

Additional questions about the intake of any vaccine before arrival to Qatar (categorical variable with the options of either yes or no answers). Vaccine type (seven different options together with an open-end question for any other potential vaccine). The personal opinion about getting a protective vaccination against measles or any other infectious disease (answers could be one out of four different options). Participants declared disagreements about vaccine intake after arrival were asked for the possible reason, and the responses were classified into five possible answers (categorical variables).

Measles related history among household contacts; it includes history about the incidence of measles, fever with rash, or hospitalization related to it if any (categorical variables).

Calculated awareness level score

The current applied awareness score divides those answered that they do know measles (n=384) into three levels based on a calculated score, where the higher score indicates a higher level of measles awareness. These levels are (Below average, average, and above average) [15,16]. The range of the score is between zero and 14. The level was set at one standard deviation above or below the calculated mean.

The following four questions were used to generate the measles awareness score:

1. "According to your knowledge, how measles communicated between people?" Answers were of seven different choices where score (1) was given to each correct answer, and score (0) was given to each wrong answer or is not sure.
2. "In your opinion, how to protect yourself from acquiring measles infection?" Answers were of eight different choices where score (1) was given to each correct answer, and score (0) was given to each wrong answer or is not sure.
3. "Do you think there is a vaccine for measles?" Answers were given a score of (2) for yes, (1) for being not sure, and (0) for no.
4. "If there is a vaccine for measles, it is beneficiary?" Answers were given a score of (2) for yes, (1) for being not sure, and (0) for no.

The questionnaire`s content and face validity were established by literature review, consultation of experts in the field. It was prepared in English and translated into Arabic with back translation at Hamad Medical Corporation (HMC) accredited translation center to ensure its validity and reliability. Furthermore, PI trained four multi-lingual data collectors that are officially assigned by the MC management.

The management also assigned a devoted nurse to help in the logistic issues. The pretesting for the questionnaire was conducted on (50) workers before the actual data collection clarified the average completion to the research team. Refinements were made based on feedback from the pre-test. Pilot participants excluded from the main study stream.

Ethical approvals

The study granted approvals from the Institutional Review Board (IRB) of HMC, and the MC management. Study participants were asked to sign a generic consent form declaring their agreement. Both participant's privacy and information confidentiality were ensured during the study.

The PI entered all collected data from completed questionnaires and extracted spreadsheets into an Excel® sheet daily, and later all data was exported to a "Statistical Package of Social Science" version 20.0 (SPSS®) software database for analysis [17]. Different questions included in the interview questionnaires were coded and entered regularly. Descriptive statistics were used as appropriate.

Results

Socio-demographic data

The majority of participants were male as they constituted (94.1%) of the sample. The mean age of participants was (31.35 years + 8.76 SD). As regards nationalities encountered, more than one-third of the sample were from the Philippines (36.5%). Marital status categories were (single, married, widowed, and divorced), it was observed that (56.1%) of participants were married.

Moreover, most of them have either a "secondary" or a "university or above" level of education constituting (43.9 & 41.9%, respectively). While (55.5%) were currently seeking manual jobs. Around (42%) of them have a sufficient income to meet their routine expenses, as shown in Table 1.

Socio-demographic characteristics	Frequency (n = 422)	%
Gender		
Male	397	94.1
Female	25	5.9
Age in whole years		
<25	95	22.5
25 - <35	196	46.5
35 - <45	100	23.7
≥ 45	31	7.3
Mean + SD (31.35 + 8.76) years		
Nationality		
Philippines	154	36.5
Sri Lanka	128	30.3
India	61	14.4
Egypt	37	8.8
Nepal	13	3.1
Other	29	6.9
Marital status		
Single	185	43.9
Married, widow or divorced	237	56.1
Educational level		
Illiterate	9	2.1
Primary	4	1.0
Preparatory	47	11.1
Secondary	185	43.9
University or above	177	41.9
Proposed job in Qatar		
Manual worker	234	55.5
Household worker	8	1.9
Technical worker	111	26.3
Office job	11	2.6
Professional	58	13.7
Income		
In department	3	0.7
Just meet the routine expenses	177	41.9
Meet the routine and emergency expenses	107	25.4
Able to save or invest money	135	32.0

Table 1: Distribution of study participants according to their socio-demographic characteristics (n=422).

Access to health care & information about measles

Furthermore, the majority (92.7%) of the participant has access to health-related information. While most of the interviewed foreign workers got one or more sources to access health-related information, the commonest was access through audio-visual sources (88.4%) followed by the access through printed material and the internet (75.4% and 73.2%) respectively, as shown in Table 2.

Characteristic	Frequency (%) (*n*=422)
Regular Healthcare Provider at Their Country of Origin	
Private	189 (44.8)
Health insurance	13 (3.1)
Free Governmental health services	200 (47.4)
No regular healthcare provider*	20 (4.7)
Access to Health Information	
No access	31 (7.3)
Access by any mean	391 (92.7)
Sources to Access Health-Related Information**	
Printed material	318 (75.4)
Audio-visual messages	373 (88.4)
Internet materials	309 (73.2)
*(i.e. traditional healers, folk remedies, self-care or no care); **Answers are not mutually exclusive	

Table 2: Distribution of study participants according to their regular healthcare provider and access to health information related to measles, Medical Commission, 2014.

Measles knowledge & awareness, history, and vaccination questions

Participants were asked screening questions about their general knowledge regarding measles, around (91%) declared being knowledgeable about the disease, as seen below in Figure 1.

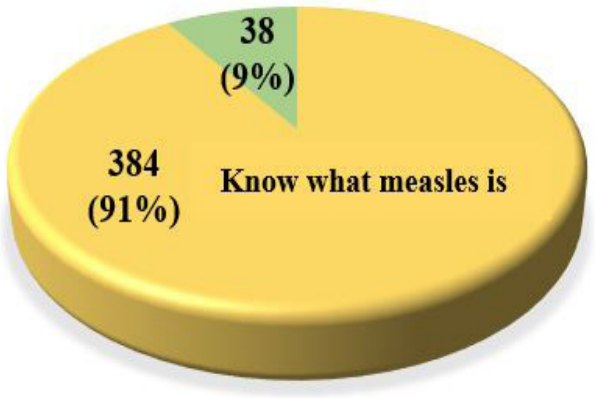

Figure 1: Distribution of study participants according to their knowledge about measles (*n*=422).

Participants were asked screening questions about their general in Table 3 amongst those participants who know about measles, most of them (81.8%) knew that there is a vaccine for measles, and (97.1%) considered that a vaccine against measles is beneficiary, while only (2.6%) disagreed. When these participants were asked whether they have ever been vaccinated against measles; (44.3%) reported a history of vaccination, (36.5%) were not sure and (19.2%) reported not being vaccinated. Furthermore, among those who took the measles vaccine (n=170), they reported that the reason behind taking it was either routine intake or an obligation for traveling (43.5% and 40%), respectively.

Characteristic	Frequency* (%)
There is a vaccine for measles	
Yes	314 (81.8)
No	5 (1 .3)
Not sure	65 (16.9)
If there is a vaccine for measles; it is beneficiary	
Yes	373 (97.1)
No	10 (2.6)
Not sure	1 (0.3)
History of measles vaccination	
Yes	170 (44.3)
No	74 (19.2)
Not sure	140 (36.5)
Reason for taking the measles vaccine (*n*=170)	
Routine	74 (43.5)
Obligation for travelling	68 (40.0)
Obligation after occurrence of infection to a family member	3 (1.8)
Choice was optional (for own protection)	25 (14.7)
Place of measles vaccine intake (*n*=170)	
Governmental setting	67 (39.4)
Private sector (hospital or clinic)	98 (57.7)
Not sure	5 (2.9)
Time of measles vaccine intake (*n*=170)	
Within the last 2 years	77 (45.3)
More than 2 years or during childhood	93 (54.7)
Reason for not taking measles vaccine (*n*=74)	
Never offered the vaccine	56 (75.7)
Not able to take it due to a health reason	5 (6.8)
Not able to take it due to other reasons	13 (17.5)
*Among only those who are aware about measles	

Table 3: Distribution of study participants who are aware about measles according to their measles vaccination awareness and history, Medical Commission, 2014.

More than half of them (57.7%) mentioned that they took it in the private sector, and (39.4%) took the vaccine at a governmental setting. Besides, from those who took the vaccine, a majority (54.7%) stated that they took the vaccine more than two years ago or during childhood, while (45.3%) have taken it within the last two years. Among those who were not vaccinated against measles (n=74), they reported that they were never offered the vaccine, representing the majority (75.7%).

When they were asked about their view about vaccine intake after their arrival to Qatar, (84.4%) mentioned that they would agree to take vaccines when offered to them.

However, only two (2) participants said that they are not going to take a vaccine by any means, one was advised by others not to take any vaccine what is so ever, and the other thing that taking a vaccine may affect his future job.

The majority of participants stated that they did not take any vaccine before they arrived in Qatar (71.8%), but (27.7%) of them did. The MMR vaccine was taken by (13.7%) of the studied participants before their arrival, and (11.1%) took the measles mono-vaccine, as shown in Table 4.

Characteristic	Frequency (%) (*n*=422)
View about vaccine intake after arrival to Qatar	
Actively seek vaccine intake	5 (1.2)
Vaccine intake when offered	356 (84.4)
Vaccine intake only if obligatory	56 (13.3)
Refuse to take any vaccine by any means	2 (0.4)
Not sure	3 (0.7)
Vaccine intake before arrival to Qatar	
Yes	117 (27.7)
No	303 (71.8)
Not sure	2 (0.5)
Type of vaccine taken before arrival to Qatar* (*n*=117)	
Measles (mono-vaccine)	47 (11.1)
MMR	58 (13.7)
Seasonal Influenza	29 (6.9)
Hepatitis A	11 (2.6)
Hepatitis B	12 (2.8)
*Answers are not mutually exclusive, MMR: Measles, Mumps and Rubella.	

Table 4: Distribution of study participants according to their travel-related vaccination awareness and history, Medical Commission, 2014.

On questioning the study participants who are aware about measles and reported history of acquiring it (n=116) according to the history of their measles associated symptoms. The majority of them (81%) recalled having fever and having a rash (86.2%), whereas only one participant (0.9%) gave a history of cough during his measles illness. Symptoms not recalled by them were either running nose (coryza or rhinitis) or red eye (conjunctivitis).

Moreover; when participants who knew about measles (n=384) were asked about their awareness about measles' mode of transmission as illustrated in Table 5, the minority of these participants replied appropriately that measles patients could infect others through airborne transmission (14.6%), through proximity as in hugging and kissing (21.3%), through aerosol transmission (36.4%), or indirect transmission by contacting contaminated surfaces (25.5%).

Characteristic*	Frequency (%) (*n*=384)
Airborne transmission	
Yes	56 (14.6)
No	328 (85.4)
Hugging and kissing	
Yes	82 (21.3)
No	302 (78.7)
Aerosol transmission	
Yes	140 (36.4)
No	244 (63.6)
Indirect transmission through contaminated surfaces	
Yes	98 (25.5)
No	286 (74.5)
Skin contact	
Yes	173 (45.1)
No	211 (54.9)
Blood contact	
Yes	65 (16.9)
No	319 (83.1)
*One or more choices	

Table 5: Distribution of study participants who are aware about measles according to their knowledge about measles mode of transmission, Medical Commission, 2014.

On the other hand, part of them has the wrong information that the measles virus could be transmitted from the patient to others through skin contact (45.1%) and through blood contact (16.9%).

Similarly, awareness about measles regarding its preventive measures, as seen in Figure 2. It showed that only the minority understand that avoiding the following practices are considered a preventive measure against transmission: avoid airborne transmission (15.1%), avoid proximity as in hugging or kissing a patient (20.3%), avoid exposure to aerosol from a patient during coughing or sneezing (33.9%), avoid touching a surface soiled with patient secretions after coughing or sneezing (25.2%). On the other hand, avoiding skin contact with a patient while he/she got rash was seen incorrectly as a preventive measure by (36.5%) of those participants, as well as avoiding contact with patient blood (13.5%). However; (61.1%) of those participants understand that taking the measles vaccine is a preventive method against the disease, and the rest disagreed.

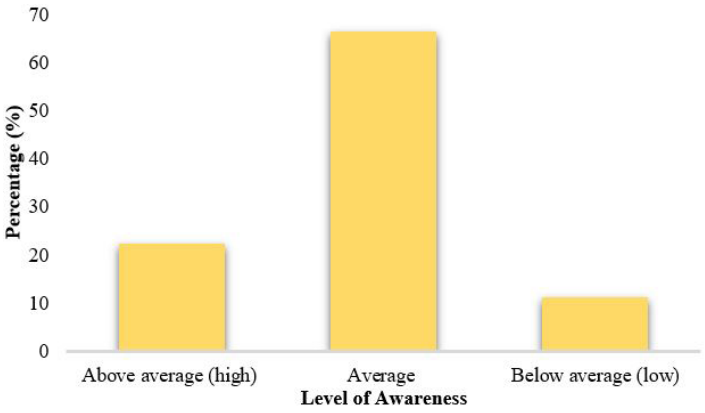

Figure 2: Distribution of study participants who are aware about measles according to their knowledge about measles preventive measures, Medical Commission, 2014. *n*=384.

Calculated awareness level score

Level of measles awareness was calculated and shows that among the (384) study participants who know about measles (66.4%) had scored average concerning measles awareness, around (22.4%) scored above average (high awareness) and only (11.2%) scored below average (low awareness). Furthermore, awareness score mean + SD was (6.5 + 3) (Figure 3).

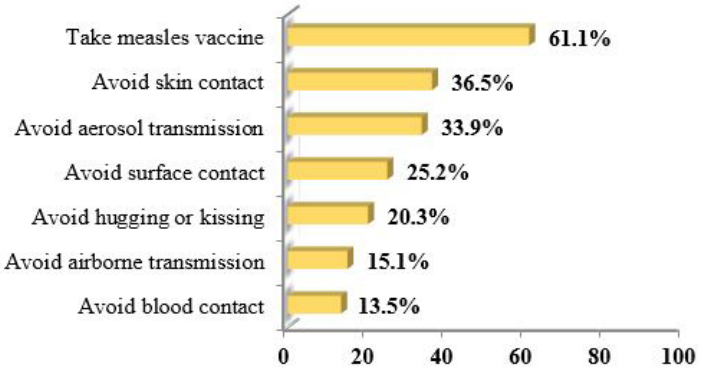

Figure 3: Distribution of study participants who know about measles according to their measles awareness level, Medical Commission, 2014.

Discussion

High measles virus incidence and frequent outbreaks or epidemics are reported frequently in many parts of the developing world, in the majority of cases due to low coverage of the measles vaccine. This vaccine awareness is an essential determinant for better public vaccination coverage [18-20].

The current study showed that although (91%) of participants claimed to be aware of measles, most of those who are aware answered incorrectly about its mode of transmission and preventive measures, even that only (61.1%) know that measles vaccine is protective. Limited references about the knowledge and awareness about the measles among workers made the comparison quite tricky. Nevertheless, such critical non-comparative data is available among parents and health care workers.

Such knowledge and awareness are profoundly affected by the social determinants of the participants. It is quite low in some communities, as mothers in low-income countries, while such knowledge is higher in health care workers.

A study evaluated coverage of mass measles vaccine awareness campaign done in (2011) that estimated parental awareness and the determinants for low/no coverage; household survey was conducted four months after the measles campaign in Karachi, Pakistan [21]. Parents of children younger than five years were administered a structured questionnaire about their knowledge and participation in the measles campaign of (1020) eligible households studied, only 282 (28%) parents knew about measles supplementary immunization activity, mainly from public announcements (49%). Of these, 174 (62%) children received the measles vaccine, whereas, 108 (38%) parents refused the measles vaccine. Overall, only (17%) of children received the measles vaccine during this campaign. Low maternal education, not having received the DPT/Pentavalent-3 vaccine, and routine vaccination from public Expanded Program on Immunization (EPI) facility were significant determinants for low vaccination coverage.

Similarly, in the current study, awareness was significantly lower among those who were lower in education and income. Many authors also confirmed similar findings of low knowledge [22-26].

The knowledge and awareness are much higher among health care workers due to mainly the medical and professional background. Petti, et al. addressed the higher level of knowledge and awareness among the dentists (60%) during a survey in Italy, however, this is lower for health care workers [27]. Also, Herzog, Raúl, et al. confirmed almost similar findings through a systematic review conducted on (2013) [28]. Many other references established the same conclusions [26,29,30].

Conclusion

Although (91%) of the studied workers claimed to be aware of measles; most of those who are aware answered incorrectly about its mode of transmission and preventive measures, except that (61.1%) know that the vaccine is protective, and (84.4%) of the participants accept to take a vaccine if offered. Among those participants aware of measles, the majority (81.8%) are aware of the presence of a vaccine for measles, (44.3%) declared taking it but (70%) took only one dose.

These findings demonstrate the importance of delivering the proper health information to this subgroup and educating these workers about measles mode of transmission and preventive measures through multi-lingual, informative, and straightforward messages using different tools irrespective of their measles awareness status.

Acknowledgment

We are grateful to those professionals who took the time and effort to participate in the study from PHCC, HMC, and MC. We would also like to convey thanks to the workers who participated in this study by giving their time and information.

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29. Agha F (2007) Assessment of Knowledge of Immunization in Practicing Doctors. I also appreciate the efforts of all those who have been striving hard for getting the Fellowship in Infectious Diseases recognized from the College of Physicians & Surgeons, Pakistan. We remain indebted to the CPSP for comprehending the importance of the specialty. This will definitely open up new horizons for the younger specialists interested in the field. Our priorities, besides what we are doing, should also focus on two important aspects; hospital infection control and biosafety. We need to encourage all the medical researchers to contribute and create awareness among the concerned in these two fields. p. 9.

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