

Reliability and Validity of Field Testing of the World Health Organization (WHO) Questionnaire about Knowledge, Attitude and Practices (KAP) Towards Zika Virus Among Pilgrims (2017-Season)

Sami A. Alsalmi, Ahmed A. Alsalmi, Hamad S. Alosaimi,
Mohannad A. Alattar, Sultan S. Algethami

*School of Medicine, Taif University, Taif, Makkah, Saudi Arabia.

Corresponding author: Sami A. Alsalmi, E-mail: sami.aali.alsalmi@gmail.com

ABSTRACT

Background: ZIKA virus is a known public health emergency of international concern. The mass gathering places like Hajj are the most viable environment for transmission of such virus.

Aim of the work: this study aimed to determine the reliability, validity and conduct the field testing of the field testing of Arabic version of WHO-KAP questionnaire.

Material and Methods: this was a cross-sectional study in which the Arabic version of WHO-KAP questionnaire was tested in the field of Al-Hajj season in 2017 by using multistage clustering sampling method and retested online in the period from 23rd of August, 2017 till 20th of September, 2017.

Results: a total of 399 pilgrims from 11 countries were included with 61.4% that were females. The age of the subjects ranged from 16 to 56 years old with means of 23.47± 14.19 and 15.49± 16.87 for males and females, respectively. Internal consistency was measured using Alpha Cronbach's test which was 0.858. Test reliability was measured by Intra Class Correlation Coefficient (ICC) that was 0.858. Kaiser-Meyer-Okin Measure of Sampling Adequacy (KMO-test) was done and showed a significant change (p-value= 0.0001). KMO measured 0.871 which indicated a sufficient data to conduct the Factorial Analyses. Bartlett's Test of Sphericity (Approximate Chi-square = 12714.212 , df =1485, p = 0.000). Loading of items of WHO-KAP were >0.4 which led to preservation of all the chosen items.

Conclusion: the Arabic version of WHO-KAP questionnaire had good internal consistency. It can be used in the future as field test.

Keywords: ZIKA virus, microcephaly, mass gathering, hajj, Saudi Arabia.

INTRODUCTION

ZIKA virus is a known Public Health Emergency of International Concern. The rise in the spread of Zika virus has been accompanied by a rise in cases of microcephaly and Guillain-Barré syndrome. It was first identified in Uganda in 1947 in monkeys, Zika was later identified in humans in 1952. The first large outbreak of disease caused by Zika infection was reported from the Island of Yap in 2007. There were currently several countries experiencing Zika virus outbreaks ^(1,2). The mass gathering places are the most viable environment for transmission of such virus. Hajj is considered to be the biggest gathering event of people from over 180 countries and that is the major reason for investigating this field ^(3,4).

ZIKA virus is a member of Flavivirus genus which also includes West Nile, dengue, yellow fever and others. As a member of the Flavivirus genus, ZIKA virus is a positive-sense, single-stranded RNA genome which is enveloped and icosahedral virus. ^(5,6) ZIKA transmitted through mosquito *Aedes subgenera*, which can be transmitted through modern transportation systems and also transmitted from human to human through sexual

contact⁽⁷⁾. There were several outbreaks of ZIKA virus, the largest was in May 2015, where the Brazilian Ministry of Health estimated that between 440,000 and 1,300,000 of the population are suspected cases of ZIKA virus in Brazil⁽⁸⁾. After the outbreak of ZIKA in Brazil, it was clear that there is an increase in the incidence of ZIKA virus from 0.5 cases per 10,000 births to 20 cases/10,000 births⁽⁹⁾. ZIKA is also associated with Guillain-Barre Syndrome⁽¹⁰⁾.

Combination of preventive measures included advice to aware the community about mosquito bite protection measures can reduce the risk if ZIKA virus outbreak⁽¹¹⁾. In Saudi Arabia *Aedes aegypti* mosquito is present throughout the year and due to the mass gathering places in Saudi Arabia especially in Hajj and Umra there is a risk of outbreaks, adding to that the lack of awareness among the public about preventing the transmission of the disease⁽⁴⁾.

This study aimed to determine the reliability, validity and conduct the field testing of a WHO published survey Arabic version of ZIKA virus in order to improve the awareness of the public in

Saudi Arabia and Arab countries about the prevention of ZIKA virus.

MATERIALS AND METHODS

A cross-sectional study in which the Arabic version of World health organization KAP (knowledge, attitude and practices) questionnaire was tested in the field in hajj season of 2017 by using multistage clustering sampling method and retested online (To examine the test-retest reliability of the WHO-KAP) in the period from 23 of August, 2017 till 20 of September, 2017.

Sample size was determined (with knowing that the total number of the pilgrims which was 1,862,909) by using the EPI Info Program, 7th edition^(12,13).

The sampling method in this study was depending on the multi-stage clustering approach. The first stage was applied on the regions of mina as a total. Mina (Tent city) has 7 regions that were distributed around Jamarat territory. Each region had a specific number of camps of multiple nationalities, Arabs camps were present throughout the regions except the region 4 (that was excluded). In the first stage, simple random method was used to choose one camp from each region (Except region 4). In the second stage, the target sample size was distributed on the basis of a ratio (49:79:43:49:100:66 for 1-7 except 4, respectively). In the third stage, a simple random technique was used in choosing pilgrims in the selected camp. The first stage is revisited in the condition of low number of volunteered pilgrims.

After erasing pilgrim's names and replacing it by serial study code for each case, then the data will be transferred to SPSS database. All continuous variables were expressed as mean \pm SD. P- value less than 0.05 was considered significant.

Research proposal was reviewed and approved by the institutional review board (IRB) of Taif University. No study activities were done before we have got the approval.

RESULTS

A total of 399 pilgrims from 11 Arabic Speaking countries were included. 61.4% were females. The age of the subjects ranged from 16 to 56 years old with means of 23.47 ± 14.19 and 15.49 ± 16.87 for males and females, respectively. Internal consistency was measured using alpha Cronbach's test which was 0.858 (**Table 1**).

Test retest reliability was measured by Intra-Class Correlation Coefficient (ICC) that was 0.858. Kaiser-Meyer-Oklin Measure of Sampling adequacy (KMO-test) was done and showed significant change (p-value= 0.0001).

KMO measured = 0.871 which indicated a sufficient data to conduct the Factorial analyses.

The exploratory factor analysis was used to test the construct validity of the WHO-KAP using principal component extraction method and direct obliment an Kaiser normalization rotation method (oblique rotation) that was chosen after exploring the component correlation matrix (>0.32 in many cases) . The Kaiser-Meyer-Oklin test was found to be consistent with Bartlett's Test of Sphericity (approximate chi-square = 12714.212 , df =1485, p = 0.000). The loadings of the items of WHO-KAP was shown in **table 2** were >0.4 which led to preservation of all the chosen items (based on the corrected item total correlation coefficient results)

The item that had the highest loading (0.897) was item 55, "If a woman gets Zika while she is pregnant, what should she do?" whereas the item that had the lowest loading (0.447) was item 4, "Who can get Zika?".

The mean of the loadings was 0.650. The internal consistent reliability of The Arabic version of World health organization knowledge, attitude and practices (KAP) towards ZIKA virus questionnaire, Cronbach's alpha was used for the total scale and for each item by calculating the Alpha Cronbach's value if item was deleted as shown in **table1**. All of which achieved the acceptable cut-off point (0.70) reported by **Polit and Beck**⁽¹⁴⁾.

The Cronbach's Alpha Value ranged between 0.850 to 0.864 and indicated a high internal consistency for this scale.

Table 1: the Arabic version of World health organization knowledge, attitude and practices (KAP) towards ZIKA virus questionnaire items internal consistency

Questionnaires	Cronbach's Alpha if Item Deleted
When did you first hear about Zika?	0.857
Where / from whom did you first hear about Zika?	0.858
Do you think it is possible to get Zika in your community / local area now?	0.857
Who can get Zika?	0.855
What causes Zika?	0.853
How does a person get Zika?	0.851
What are the signs and symptoms of Zika?	0.855
Does everybody who gets Zika show symptoms?	0.857
Can you prevent Zika?	0.857
Is there treatment for Zika?	0.857
If Yes or Maybe (to previous Q), what is the treatment for Zika?	0.857
You should not use Aspirin or Ibuprofen to treat Zika?	0.857
What individuals or groups are more at risk of harm from Zika?	0.855
If a pregnant woman has Zika, what are the risks she faces?	0.856
If a pregnant woman has Zika, what are the risks for her fetus / baby?	0.856
Where / from whom have you heard information about Zika?	0.854
What is Microcephaly?	0.859
Do you think there is a link between Zika and Microcephaly?	0.857
What is Guillain-Barré Syndrome?	0.859
Do you think there is a link between Zika and Guillain-Barré Syndrome?	0.857
Do you think a pharmacy or local drug vendor can effectively treat a person with Zika?	0.857
Do you think a public health post / health centre / health facility / can effectively treat a person with Zika?	0.856
If somebody in my family were to get Zika, I would want it to remain private /a secret.	0.856
If a person gets Zika, are they discriminated against or stigmatised because of it?	0.857
If a person gets Zika, are their family discriminated against or stigmatised because of it?	0.857
Women should avoid getting pregnant at this time because of Zika.	0.856
If Strongly agree or Agree (to previous Q), why should a woman avoid getting pregnant because of Zika?	0.856
If Strongly agree or Agree (to previous Q), how should a woman avoid getting pregnant at this time?	0.855
If Disagree or Strongly Disagree (to previous Q), why should women not avoid getting pregnant at this time?	0.855
All women who get Zika during pregnancy should have access to safe, legal abortion.	0.856
What worries or concerns you most about Zika?	0.854
What is the likelihood that a woman who had Zika whilst she was pregnant will have a child with Microcephaly?	0.856
All women who get Zika during their pregnancy should have access to safe legal abortion services	0.855
Since you heard about Zika, have you taken any action to prevent yourself from getting Zika?	0.857
If Yes (to previous Q), what action have you taken to prevent yourself / your household from getting Zika?	0.857
What challenges / difficulties did you face in taking that action?	0.856
If No (to previous Q), why have you not taken any action to prevent yourself from getting Zika?	0.855
How can you reduce or remove mosquitos from your house / compound?	0.855
Before Zika, which of the following did you routinely do?	0.853
When did you last clean / scrub your water source / storage unit / water container(s)?	0.856
How did you last clean and protect your water source / storage unit / water container(s)?	0.857
If a person (not a pregnant woman) thinks they have Zika, what should they do?	0.85
If you or somebody else in your household (not a pregnant woman) had a mild fever now, what would you do?	0.855
If you or somebody in your household (not a pregnant woman) had a high fever now, what would you do?	0.855
If you had a fever now, would you consider having a test for Zika?	0.857
Since you heard about Zika, have you and / or your partner taken an action to prevent unintended pregnancy?	0.855
If Yes (to previous Q), what action have you and/or your partner taken to prevent unintended pregnancy?	0.854
If No (to previous Q), why have you / your partner not taken action to prevent unintended pregnancy?	0.857
All pregnant women should be tested for Zika.	0.855
If a woman gets a fever whilst she is pregnant, what should she do?	0.855
If a woman wanted to terminate a pregnancy, how would she do this?	0.864
From where / whom would you like to get information about Zika?	0.853
If you had a question about Zika, who would you ask?	0.864

If there was a vaccine available against Zika, would you consider having it?	0.859
If a woman gets Zika while she is pregnant, what should she do?	0.857

Table 2: the Arabic version of World Health Organization knowledge, attitude and practices (KAP) towards ZIKA virus questionnaire items loadings

	item Loading
K1	0.657
K2	0.786
K3	0.633
K4	0.447
K5	0.619
K6	0.634
K7	0.505
K8	0.56
K9	0.562
K10	0.689
K11	0.547
K12	0.57
K13	0.579
K14	0.563
K15	0.596
K16	0.764
K17	0.614
K18	0.677
K19	0.642
K20	0.658
A1	0.629
A2	0.615
A3	0.59
A4	0.753
A5	0.718
A6	0.654
A7	0.81
A8	0.752
A9	0.657
A10	0.531
A11	0.608
A12	0.596
A13	0.727
P1	0.726
P2	0.647
P3	0.825
P4	0.522
P5	0.679
P6	0.63
P7	0.549
P8	0.727
P9	0.612
P10	0.67
P11	0.695
P12	0.564
P13	0.615
P14	0.653
P15	0.736
P16	0.681
P17	0.524
P18	0.746
P19	0.65
P20	0.853
P21	0.62

P22

0.897

DISCUSSION

The current study aimed to validate the WHO-KAP instrument that was developed to assess the knowledge and attitude and practices of a participant towards Zika. Hajj is one of the highest gathering occasions that occurred annually which has high racial diversity with more than 163 countries pilgrims share in this religious event. Validation of such questionnaire mandates the understanding of Arabic speaking people from different countries due to the cultural differences between them. So, Hajj was the perfect time to validate such questionnaire. In addition, Hajj is one the mass-gathering events that multiple experts recommend a highly standards precautions to prevent Zika suspecting cases to enter the country at the Hajj time as it was preceded by an outbreak in South America Countries. So, it is a highly sensitive time that the awareness of the pilgrims regarding ZIKA have crucial role in managing the expected crises. Recruiting a relatively large sample of patients with DM from 6 areas in Mina (place in Makkah which most of the pilgrims spent their most of time) to ensure the representativeness of the sample, the generalizability of the study results and use of the WHO-KAP in future Arab studies in this field. The process of selection of questions from The WHO bank was based on many criteria: 1) It has to be not repeated. 2) It must has clear choices.3) it has to be a non –cultural conflicting nor religious conflicting 4) It has >0.4 corrected Item total correlation. The Total selected questions were 55.

The relationship between the sample size and items loadings or the factorial analysis results as a whole was examined by **Maccallum et al.** ⁽¹⁵⁾, they revealing that as the sample size is increased the loadings have to be decreased. However, This relationship is believed to be used to expect variation when the sample was increased. In our case most of the questions were had the choice "I don't Know" (in case the participant didn't know the answer to a question) . This is a major contributing factor to decrease the expected variation. In addition, this may change the level of cross loadings in terms of high sample size.

The construct validity of this questionnaire wasn't tested in this study due to the absence of scoring method that would be used in building a model and to test it via Confirmatory Factorial analysis (CFA) or Principal Factorial Analysis (PFA). However, the results of the current study support the use of the WHO-KAP and allow for future Arab studies in the different countries to use this measure to add to its psycho-metric properties.

CONCLUSION

The Arabic version of WHO-KAP questionnaire has a good internal consistency. Also, this test has high stability. So, the use of

such questionnaire in future works in the field of mass gathering places (Schools, university,..etc) would be more feasible after what had been shown in this study. Future study to ensure the construct validity after agreement on a scoring method (needs virologist to review the content of the WHO-KAP Questions with a psychometrist).

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