

Nutrition-Related Knowledge, Attitudes, and Practices (KAP) of Preschool Children's Mothers and Associated Factors

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ABSTRACT

This study aimed to assess the nutrition related (KAP) of mothers of preschool children in Jordan. A cross-sectional study was performed with 854 mothers utilizing a structured KAP questionnaire. The influential factors were investigated using multiple linear regression (p -value <0.05). 61.6% of the mothers had moderate nutrition-related knowledge; 73.3% had a good attitude and 53.6% of them had moderate practices. The mother's age, education level, and working status were associated significantly with the mother's knowledge and attitude (p -value <0.05). Kids' number was associated with the mother's nutrition practice, and the presence of the child in the nursery was positively associated with improving all the nutritional KAP dimensions. Social media was the main source of nutritional information for the mothers. There was a moderate knowledge, good attitude, and moderate practice of mothers regarding the balanced nutrition of children. Mothers' age, education level, and socioeconomic status constituted factors that affected the mother's knowledge and attitude level. The presence of the child among his peers in the nursery is one of the factors that determine the level of the nutrition KAP of the mothers.

Keywords: Attitude, Children, Knowledge, Mothers, Nutrition and Practice.

INTRODUCTION

Globally, at least one out of every three children under the age of five is stunted, wasting, or overweight and one of every two children suffers from hidden hunger due to vitamin and other important nutrient deficiencies^{1,2}. As for national scope, many studies reported that the majority of Jordanian preschool children aged from three to six years were suffering from severely wasting and severely undernourished, malnutrition, and macro and micronutrient deficiency³⁻⁶. What children consume has an impact on how they feel, behave, appear, and learn. Balanced nutrition plays an important role in a child's growth, development, and overall functioning^{7,8}. Adequate nutrients during childhood and adolescence are considered crucial factors of human health and decrease the risk of future chronic diseases like cardiovascular disease, obesity, type 2 diabetes, osteoporosis, and cancer⁸⁻¹⁰, and lower the risk of death¹¹.

Mothers are primary responsible for the type and quantity of food accessible to their children during the first six years of life^{10,12-14}. Therefore, the nature and quality of care provided to the kid are influenced by the mother's understanding of childcare⁹. Children are not accountable for their food supply or the quality of their diet, especially preschool children¹⁵. During feeding, mothers must pay close attention to what is the proper feeding for their children's age, physical circumstances, and cultural or religious traditions. The dining environment and interactions with the mother can foster a warm and welcoming attitude toward food, promoting healthy eating habits and a favourable attitude toward food¹⁵. In the health community, the KAP model has been widely utilized to influence health-related behaviour¹⁶. Therefore, improving knowledge improves attitudes and behaviours, reducing the human and economic prevalence of diseases¹⁶ and has a positive impact on the child's health^{10,17-23}. Knowledge in this

concept is the ability to remember and recall specific facts about the benefits of food and nutrition¹². Knowledge may be a critical aspect in establishing dietary changes, as it influences the mother's attitude and practice, and hence the family's nutrition status²⁴. In contrast, improper nutrition knowledge among the mother leads to negative attitude and poor practices toward her family^{9,12,16,18}. Meanwhile, eating attitude is the behaviour based on their emotional, motivational, perceptual, and cognitive views, regardless of whether or not they know²⁴. Health concerns, dietary practices, nutritional advice, dietary limitations, and dietary preferences can all influence a person's positive or negative attitudes toward food and nutrition. Attitudes, experience, knowledge, and norms influence children's eating habits²⁵. Therefore, the higher education level of the parents affects positively nutrition knowledge and consequently translated to a good attitude and good practices which will reveal the good health status of the children. The responsibility of parents and other caregivers in feeding is to provide good structure, age-appropriate assistance, and healthy food and beverage choices according to the principles of balanced nutrition¹². Mothers' KAP toward balanced nutrition and a healthy lifestyle is crucial in supporting their children's nutritional and health conditions. The Dietary Guidelines for the children must be introduced and implemented among pre-school children to promote their future nutritional status and intellectual progress. From this perspective, this research aimed to assess the nutritional Knowledge, Attitude, and Practice (KAP) of Jordanian mothers with preschool children and the influenced factors.

MATERIALS AND METHODS

Study Design, Participants, and Setting

A cross-sectional study was conducted between June and September 2021 in Jordan by using an online questionnaire to determine the nutritional knowledge of the mothers with preschool children aged between 3-5 years. Convenience, non-probability sampling method was used to collect the sample according to their availability and accessibility due to the lack of a population sampling framework²⁶. Participants' online agreement to participate in this study was confirmed. The consent form, study's goal and inclusion and exclusion criteria were on the first page of the

web-based questionnaire. Participation was confirmed by clicking a button labeled (I accept to participate), which took them to the first portion of the questionnaire. Participants were free to leave the website without explaining and were under no obligation to do so. The inclusion criteria of the participants were mothers of preschool children aged from 3 to 5 years and living with their mothers. There were no monetary or non-monetary incentives offered in exchange for taking part in the study. The minimum required sample size (n=146) was estimated using the linear regression model equation to obtain 95% statistical power and a two-sided significance of 5% (i.e., a two-sided p-value less than 0.05)²⁷. More participants were surveyed to increase the statistical power of the study.

The Study Questionnaire

Data collection was completed in a collaboration with the National Council for Family Affairs (NCFA) in Amman, Jordan. A self-administered, online questionnaire was published by the study team on social media (e.g., Facebook, Instagram) pages, and on the nursery's web pages. The online questionnaire opened from June to September 2021 and all the questions were mandatory in the form to avoid missing data.

The questionnaire included two sections; the first one was the socio demographic characteristics of the mother and the second section of the questionnaire was designed based on the questionnaire developed by Prasetya & Khomsan (2021) to assess the mother's KAP regarding the balanced nutrition of the children¹². The questionnaire assessed mothers' KAP based on the Healthy People 2020 objectives in Nutrition²⁸ (increase the contribution of total vegetables and fruits to the diets, eat a variety of food, increase the contribution of whole grains to the diets, reduce consumption of calories from added sugars, reduce consumption of calories from solid fats and saturated fat, reduce consumption of sodium, drink enough water, read food labels, keep personal hygiene; and conduct regular physical activity). Some food items were changed to consider Jordanian food such as the vegetable types. The questionnaire covered 20 questions regards nutritional knowledge: nutritional attitudes (15 questions), and nutritional practices (19 questions). Response categories for the knowledge section include correct/not correct,

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for the attitudes, the response was included always, sometimes, never, and for the practice section it was agreed, neutral, and disagree. Separately, KAP domains were divided into three categories based on the tertiles of the mean score distribution: poor <50%, moderate 50–75%, and good >75%. A similar study followed the same trend ²⁹.

Psychometric Analysis of the Translated KAP Questionnaire

The research team translated the questionnaire into Arabic. As part of the methodology, psychometric validation and reliability were confirmed for the translated version. The forward-backwards approach was used to complete the translation ³⁰. The questionnaire was translated by a bilingual translator (Indonesian, Arabic), and then retranslated from Arabic to Indonesian by a second bilingual translator. To check that the items were translated correctly, the original and translated surveys were compared. A pilot sample of thirty moms was used to test the Arabic KAP questionnaire. Between April and May of 2021, pilot research was conducted. Ten working days after completing the tool, the mothers were called and sent the questionnaire again. The connection between the scale items was estimated to determine the construct validity (Correlation matrices). A panel of three nutritionists who are familiar with the construct of the questionnaire edited the Arabic questionnaire. Face validity was established in the pilot sample (mothers), and content validity was proven in the panel by determining that the questionnaire was: simple and easy to understand, covered most points in the subject, could be used again, and would not infringe on the privacy of participants.

Table 1. Sociodemographic characteristics of the participants (n=854)

| Characteristics | Categories | Participants n (%) |
|----------------------------|----------------------------------------------------|----------------------------------------|
| Mother age | | 29.93 (5.46) * |
| working status | Worker Housewife | 645 (75.5) 209 (24.5) |
| Marital status | Married Unmarried | 830 (97.2) 24 (2.8) |
| Education level | ≤Secondary school Undergraduate Postgraduate | 212 (24.8) 527 (61.7) 115 (13.5) |
| Family income (JD) monthly | ≤ 500 JD >500 JD | 188 (22.0) 666 (78.0) |
| Kids number | ≤ 3 children >3 children | 664 (77.8) 190 (22.2) |
| Childcare place | Home Nursery | 369 (43.2) 485 (56.8) |

BMI: Body Mass Index. **JD:** Jordanian Dinar. *Categorical variables; n (%).* *Continuous variables; mean (SD). Undergraduate: Bachelor's degree (BSc) and diploma degree Postgraduate: master and the Doctor of philosophy degree. unmarried includes divorced and/or widow.

Finally, the precision was validated. The correlation coefficient (r^2) mean was 0.61, which reflects a strong correlation. Internal consistency (Cronbach's alpha) and test-retest reliability (Pearson's r) were used to examine the reliability. In terms of general internal consistency (Cronbach's alpha = 0.86) and test-retest reliability (Pearson (r2) = 0.98), the questionnaire was reliable. The coefficient alpha result demonstrates internal consistency. The stability coefficient revealed good reliability, indicating that the questionnaire's construct was stable.

Statistical Analysis

IBM SPSS 23.0 software (SPSS Inc., Chicago, IL, USA) was used to analyse data. All data entries were double-checked to prevent errors. All of the data was saved in a protected Google Drive that was only accessible by the main investigator. Descriptive data was shown as frequency (n), percentage, and mean (SD). Multiple linear regression models (enter method) were performed to assess factors that could affect the nutrition related KAP of the mothers. All statistics were evaluated with a two-sided test, and a p-value < 0.05 was used to determine statistical significance.

RESULTS

Participant's Characteristics

A total of 854 mothers were participating in this study. The mean age of the mothers is 29.93 ±5.46 years old, and most of them (75.5%) is worker, (97.2%) is married and 61.7% is holding undergraduate degree as shown in Table 1. Most participating mothers (78.0%) had more than 500 JD (\$705.23) as monthly income. 77.8% of the mothers had three children or less. More than half of the children (56.8%) are attending nursery.

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Knowledge, Attitudes, and Practices (KAP) of the Mothers

According to the findings, most mothers had moderate nutrition knowledge (61.6%), good attitudes (73.3%), and moderate practices (53.6%), as shown in Table 2.

Information Source

As shown in Figure 1, the dominant information source among the mothers was the social media (41.3%), and the least percentage of the mother were refer to the nutritionist (12.6%).

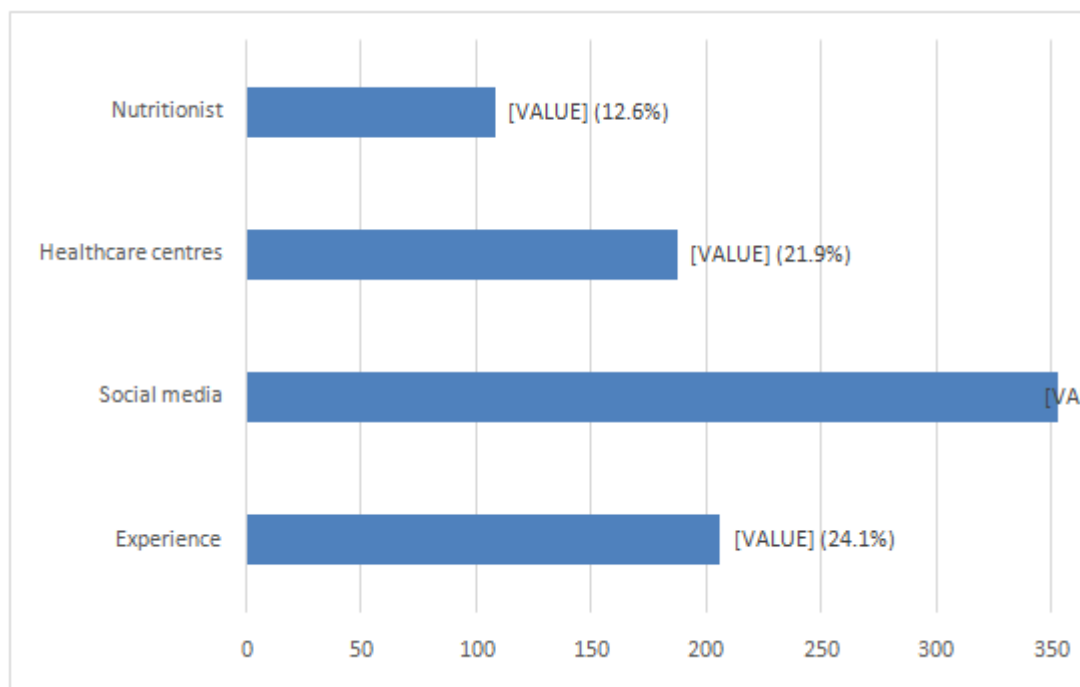


Figure1. The information source of the mothers regarding the children balanced nutrition

The Predictor Factors of the Mother's Nutrition KAP

A multiple linear regression model was run to determine the association factors with the nutrition KAP of the mothers.

The family income per month, mother's job, mother's age, and education level statistically significantly predicted the nutrition knowledge of the mother, p -value < 0.05 as shown in Table 3.

Table3. Multiple linear regressions to identify factors that associated with the nutrition knowledge of the mothers

| Variables | Unstandardized Coefficients | | t | Sig. | 95.0% CI for B | |
|--------------------|-----------------------------|------|-------|--------------|----------------|-------------|
| | B | SE | | | Lower Limit | Upper Limit |
| Kids number | -1.12 | 0.95 | -1.18 | 0.24 | -2.99 | 0.74 |
| Family income (JD) | 4.5 | 0.95 | 4.77 | ≤ 0.001 | 2.66 | 6.38 |
| childcare place | 1.99 | 0.81 | 2.46 | ≤ 0.001 | 0.40 | 3.57 |
| working status | 13.31 | 0.89 | 14.94 | ≤ 0.001 | 11.56 | 15.06 |
| Mother age | 0.55 | 0.07 | 7.79 | ≤ 0.001 | 0.41 | 0.69 |
| Marital status | 2.82 | 2.14 | 1.32 | 0.19 | -1.38 | 7.02 |
| Education level | 15.54 | 0.63 | 24.83 | ≤ 0.001 | 14.31 | 16.77 |

Independent variable: knowledge score; **Model:** (Enter) method on SPSS statistics; **B=** unstandardized regression coefficient; **CI:** Confidence Interval; **SE:** Standard Error; **Jordanian Dinar;** * statistical significance ($p < 0.05$).

The slope coefficient represents the change in the nutrition knowledge score of the mother for a one-time change in the independent variables. As such, this means that

predicted the knowledge score of the mother for families that received more than 500 JD monthly is 4.52 times greater than that predicted for families that received 500 JD

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monthly or less, and for the worker, mothers are 13.31 times greater than that predicted for housewife mother. An increase in the mother's age of one year is associated with an increase in the knowledge score of the mother by 0.55 times. As well as the predicted knowledge score for mothers who hold higher education scores is 15.54 times greater than that predicted for mothers who hold lower education levels (with all values of all other independent variables being held constant). Regards attitude, the result indicated that childcare place, mother's age, and

education level were associated significantly with the attitude score as shown in Table 4. The predicted attitude score of the mothers who send their child to the nursery is 1.93 times greater than that predicted for mothers who didn't send their child to the nursery. Similar to the knowledge results, an increase one year of the mother's age and mothers who hold higher education level is associated with an increase in attitude score of the mother of 0.24 and 2.29, respectively (with all values of all other independent variables being held constant).

Table4. Multiple linear regressions to identify factors that associated with the nutrition attitude of the mothers

| Variables | Unstandardized Coefficients | | t | Sig. | 95.0% CI for B | |
|--------------------|-----------------------------|------|-------|--------|----------------|-------------|
| | B | SE | | | Lower Limit | Upper Limit |
| Kids number | 1.27 | 0.97 | 1.33 | 0.18 | -.613 | 3.19 |
| Family income (JD) | -1.11 | 0.97 | -1.15 | 0.25 | -3.00 | 0.79 |
| childcare place | 1.93 | 0.82 | 2.34 | 0.02 | 0.31 | 3.54 |
| working status | 1.67 | 0.91 | 1.84 | 0.07 | -0.12 | 3.45 |
| Mother age | 0.24 | 0.07 | 3.28 | ≤0.001 | 0.10 | 0.38 |
| Marital status | -2.90 | 2.18 | -1.33 | 0.18 | -7.18 | 1.38 |
| Education level | 2.29 | 0.64 | 3.60 | ≤0.001 | 1.04 | 3.54 |

Independent variable: attitude score; Model: (Enter) method on SPSS statistics; B= unstandardized regression coefficient; CI: Confidence Interval; SE: Standard Error; JD: Jordanian Dinar; * statistical significance ($p < 0.05$).

The model of the practice revealed that the predicted practice score for the mother who has more than three children and sends their children to the nursery is 3.86 and 4.16, respectively greater than that predicted for the

mother who has less than three children and didn't send their children to the nursery (with all values of all other independent variables being held constant) as shown in Table 5.

Table5. Multiple linear regressions to identify factors that associated with the nutrition practice of the mothers

| Variables | Unstandardized Coefficients | | T | Sig. | 95.0% CI for B | |
|--------------------|-----------------------------|------|-------|--------|----------------|-------------|
| | B | SE | | | Lower Limit | Upper Limit |
| Kids number | 3.86 | 1.27 | 3.05 | 0.002 | 1.38 | 6.34 |
| Family income (JD) | -0.821 | 1.26 | -0.65 | 0.52 | -3.30 | 1.66 |
| childcare place | 4.16 | 1.08 | 3.86 | ≤0.001 | 2.05 | 6.27 |
| working status | 0.11 | 1.19 | 0.090 | 0.93 | -2.22 | 2.44 |
| Mother age | 0.024 | 0.09 | 0.26 | 0.80 | -0.16 | 0.21 |
| Marital status | -4.35 | 2.85 | -1.53 | 0.13 | -9.95 | 1.25 |
| Education level | 0.08 | 0.83 | 0.10 | 0.92 | -1.55 | 1.72 |

Independent variable: practice score; Model: (Enter) method on SPSS statistics; B= unstandardized regression coefficient; CI: Confidence Interval; SE: Standard Error; Jordanian Dinar; * statistical significance ($p < 0.05$).

DISCUSSION

In Jordan, this is the first study that assessed the nutrition KAP of the mothers and influenced factors, although a large number of the studies record the health status of children in Jordan³⁻⁵.

The majority of mothers had moderate knowledge, a good attitude, and moderate practices. Family income, mother's age, childcare place, mother's job and education level were significant predictors of the mother's nutrition knowledge. Regarding the nutrition attitude, childcare place, mother age,

and education level of the mother were predictors of the nutrition attitude of the mother. The nutritional practices of mothers have been associated with the presence of children in nurseries and the increase in the number of children in the family. There is concordance between these results and the number of studies^{10,18,31} that will be argued in the discussion. Vereecken and Maes found that mothers under the age of 30 and with a low educational level had the lowest knowledge level²³. As well, Özdoğan et al found that young moms (under 20 years old) had the lowest degree of knowledge, followed by women over 40 years old¹⁰. Moreover, a cross-sectional study in Ankara found that mothers' knowledge levels increase with an increase in the parent's education level, maternal age (between 31 and 35 years), and the number of children¹⁰. In this study low family income and the job status of the mother affected negatively on the knowledge levels of the mother due to the sociocultural beliefs³². Furthermore, those with a high degree of education are more likely to have better jobs and greater salaries, as well as be able to offer better health care for themselves and their families³³. This result is in agreement with Agyei et al (2021) who reported that had higher income levels women were more likely to have higher nutrition knowledge scores³⁴. In addition, Alkerwi et al (2015) concluded that nutritional knowledge influences diet quality directly and is influenced by socioeconomic factors such as education and income³⁵. A similar cross-sectional study was in agreement that the low socioeconomic is associated with the poor knowledge level of the preschool children's families¹⁴.

One of the important results of this study is that the presence of children in nurseries had a significant association with increasing the nutritional knowledge, sound attitudes and moderate practices of mothers, and this study is the first study in the Middle East that discussed this factor. More than half of the mothers in this study send their children to nurseries, and this approach improves the level of nutritional KAP among mothers and consequently may have positive effects on the health status of the child^{10,17-23}. The awareness information and the advice that the mother receives from the caregivers of the nursery such as meal preparation methods, and healthy food patterns enrich the mothers KAP¹¹.

Joining the child in the nursery means the mother's integration into an environment of specialists which gives her correct knowledge regarding her child in terms of psychological, health, and social aspects¹⁵. In addition, Mothers with more than three children were more likely to have a good nutritional knowledge and practice level due to the the experience acquired by the mother over time. Finally, the social media was the most information sources among the study respondents about children's nutrition lead to generates neutral and disapproval opinions^{17,36}. Unfortunately, internet resources frequently provide parents with outdated, erroneous, and/or contradicting information which perplexes and frustrates mothers who feed their children without knowing the proper quantities and qualities³⁷. Unfortunately, low percentage of the mothers, in this study, were referred to health professionals. The qualified health care professionals, mostly dieticians, have a broad scientific background in food composition, nutritional needs, preparation information, socioeconomic and psychologic factors that influence people's food choices and nutrition practices, as well as counselling skills to translate scientific information into layman's terms and they are able to give the patient with full nutrition information required to have a healthy child³⁷. However, most people find social media or public sources available and easy to get nutritional information instead of attending education sessions or going to the clinic or nutrition centre³⁸. Finding fast and applicable education methods such as online education or awareness mobile chatting is an urgent necessity to increase the mother's nutrition knowledge as previous studies have indicated that new media-based training programs can be effective to encourage the KAP concept³⁹⁻⁴¹.

To our knowledge, this is the first study in Jordan and Middle East that assessed mothers' nutrition KAP levels and the associated factors. The study enrolled 854 women, which is a good sample size in this study. Using multiple linear regression models to investigate factors that could be predictors for the nutrition KAP of the mothers found some remarkable results and all these factors gave the study strength. The outcome addressed most of the potential factors that may affect the mother's nutritional KAP in her children. This study added scientific evidence to the

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contributing factors, which in turn will direct the governmental and private sectors to take measures based on a scientific study that resulted from a large sample. The pre-school child needs great care, as it is a transitional stage between home and school, but education or nursery school in Jordan and the Arab countries is not mandatory at this stage. Therefore, this study included the element of the presence of the child in the nursery among the elements that affect the mother's nutritional knowledge.

CONCLUSIONS

Under the study condition, in conclusion, the study's findings fulfilled the study's objectives. The key findings revealed that the majority of the mothers obtained moderate knowledge, good attitude, and moderate practice concerning children's balanced nutrition. This study showed that the mother's nutrition knowledge and attitude were associated with the mother's age, job status and education level. However, the level of family income was associated with the level of nutritional knowledge of the mothers. More kids were associated with the nutrition practice level of the mothers and the presence of the children in the nurseries was associated with all KAP domains. Encouraging mothers to place their children in nursery school may improve the nutrition KAP of mothers toward their children. On the other hand, focusing on planning nutritional and awareness programs for low-income families, those who are less fortunate in education and who are who cannot send their children to nurseries could be one of the recommendations of this study for the authorities responsible for health care for families in Jordan, the most important of which are field training centres. The finding has several major implications for future practice toward the online nutritional programs and directing the mothers to send their child to the nurseries and using reliable scientific pages to gain correct nutrition knowledge regarding their families. More studies are required to find the other influencing factors on the family nutrition KAP such as the education level of the father and the shopping knowledge of the parents must be investigated further. In

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On the other hand, the cross-sectional design did not permit the determination of the effect and cause like the intervention studies. The mothers' opinions could have been skewed by their wish to be seen as socially responsible. As a result, the observations made about unfavourable variables could be interpreted as an underestimating of genuine values. Moreover, the evaluation was subjective, because the outcomes of this study may have been influenced by using self-administered questionnaires.

addition, more studies that include all caregivers, and find the correlation of the caregivers KAP with the child's health status are required.

INSTITUTIONAL REVIEW BOARD STATEMENT

This study was approved and registered by the Research Ethics Committee of the Faculty of Pharmacy and Medical Sciences at the University of Petra in Amman, Jordan (ID: Q1/5/2021). All ethical criteria of the Helsinki statement and its amendments from 1964 were observed in this inquiry. The Standards for Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) were followed in the preparation of this study⁴³.

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DATA AVAILABILITY STATEMENT

The data used to support the findings of this study can be obtained from the corresponding author. The Arabic/English KAP questionnaire is available under request.

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This study was not funded.

CONFLICTS OF INTEREST

None.

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