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A Cross-Sectional Study of Knowledge, Attitude, Practice, and Barriers Regarding Blood Donation among General Population in Kuwait

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Abstract

Background: Public awareness regarding blood donation during life and after death is poor in many developing and developed countries. The prevalence of blood donation varies according to the demographics of the people. The objectives of this study were to assess the knowledge, attitude, practice, and barriers regarding blood donation among the general population in Kuwait.

Methods: A cross-sectional study of 915 people was conducted between March and April 2016. Data were collected by using a survey questionnaire among the general people working in five randomly selected ministries including the Ministry of Health, Ministry of Finance, Ministry of Justice, Ministry of Education, and Ministry of Social Affair. An ethical approval for the study was obtained from the Ethics Committee of Faculty of Medicine in Kuwait University and from the ministries.

Results: Overall, about 37% the study population ever donated blood. The proportion of life-time donors was significantly higher among males than females (57.9% vs. 25.2%, respectively, $p< 0.001$). However, the knowledge scores about blood donation were significantly higher among females ($p= 0.035$). Both knowledge scores and positive scores of attitude increased with increasing age and with higher educational levels. Of the barriers, women had significantly more fear of pain ($p<0.001$) and fear of seeing blood ($p= 0.002$) compared to men. In multivariate analysis, male gender, middle and older age, knowledge score, fear of getting new infection, and fear of anemia remained significant predictors of blood donation after controlling for the confounders.

Conclusion: The study showed a low rate of blood donation in Kuwait. More community outreach programs such as blood donation campaigns should be undertaken to improve the situation, and to alleviate people's perception about the barriers.

Introduction

Blood donors are life savers. The demand for blood transfusion is increasing over time because of increase in the number of serious unintentional injuries, advanced surgical procedures, and the treatment of hematological disorders and cancers [1]. On the other hand, because of a higher risk of transmitting infections from paid donors, the World Health Organization recommends to collect blood only from voluntary and unpaid donors, which makes it more challenging to meet the demand [1].

A survey conducted in the United States showed that the number of blood transfusion increased dramatically from 1.1 million in 1997 to 2.7 million in 2007, representing about 140% increase in demands for blood transfusion [2]. However, only about 5% of individuals in the United States donate blood each year, which cannot meet the large demand [3]. The blood donations rates of African Americans are 25-50% lower than that of white Americans [4]. In 2011, 389,340 blood donations were reported in the U.S. by donors aged from 16-69 years, of which 77.7% were white Americans. The percentage of donation was highest among people aged 40-49 years [4].

A study conducted in several European countries demonstrated a significant increase in blood donation in the following countries between 2002 and 2009: Austria (from 51% to 66%), France (from 38% to 52%), Greece (from 40% to 51%), Spain (from 25% to 41%), and Germany (from 31% to 41%)[5]. In another study conducted in 17 European countries [6], only five countries including Finland, Yugoslavia, Slovenia, Spain, and the United Kingdom have had exclusively voluntary blood donation and that donors received no incentives apart from light refreshment following donation. On the other hand, The Czech Republic, Greece, Italy, Macedonia, Romania,

Croatia, and France reported that their donors were voluntary, not being remunerated, but all of Greece, Macedonia, and Romania and part of them in Croatia, Czech Republic, and Italy received some sort of incentives. The incentives ranged from one or more day off from work and travel expenses to tax reliefs and other material gifts [7]. Another study showed that some free screening test such as measurement of cholesterol and prostate specific antigen (PSA) screening for males were incentives to encourage donation [8]. Younger donors aged 25 years or less reported that they would be 4-5 times encouraged if they were offered compensatory incentives including tickets to events, discounts, lottery, raffle tickets, gifts, or a token of appreciation [8].

The prevalence of blood donation in Saudi Arabia varied from 45.8% to 53.3% [1, 9]. In Iran, 23 per 1,000 population donated blood, of which only 43% were repeat donors [10]. About 52.3% of the people stated that the main source of information about blood donation was the mass media. In India, the majority of blood donors (93%) were males, and 46% were first-time donors. The motivation for their blood donation was the need of their friends or relatives [11].

In Nigeria, only about 5% of donor bloods came from voluntary donors while family replacements and paid donors were still the

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major sources of donor blood procurement [12]. In a study conducted in sub-Saharan Africa in 2012, 77.4% of blood donors were repeat donors [13]. There were several reasons for deferral of blood donation. The most frequent one was low hemoglobin level (42.5%), especially in females. Other reasons included change of or new sexual partner (34.3%) and short inter-donation interval (4.6%) [13].

Lack of blood donation was associated with some barriers, such as fear, distrust, lack of education, and insufficient knowledge of the people [14]. The more knowledge the person has had about blood donation, the more likely that he was a previous donor [9]. Studies also showed that altruism is one of the most motivating factors for donating blood [15]. Some people believe that it is a national and religious duty while others stated that they would only donate if a family member or a friend is in need. On the other hand, the most common negative attitude reported among non-donors was a sense of fear -- fear of anemia, fear about needle prick and pain, and fear of seeing blood, especially among females [9].

According to the available information from the Central Blood Bank in Kuwait, the average number for blood donations is 250-300 units per day, which is insufficient to meet the requirement of the country. However, there is paucity of published reports about blood donation in Kuwait. To fill this gap, this study was undertaken to: 1) determine the prevalence of blood donation among the general population; 2) assess the knowledge, attitude, and perceived barriers of blood donation; and 3) explore any association of the demographic variables, the knowledge, and barriers predicting blood donation.

Materials and Methods

Population

The names of the ministries were randomly selected from a list of all ministries. Participants for this study were selected by convenience selection technique, as a first-come first-serve basis. A team of investigators divided into two, with 2-3 members in each group, visited the ministries from 9 a.m. to 1 p.m., because most of the employees are available during this time.

Ethical approval

The study proposal has been approved by the ethical committee at the Faculty of Medicine, Kuwait University and the Ministry of Health. An informed consent was taken from each of the participants before enrollment.

Questionnaire

A self-addressed questionnaire was used for data collection. The content of the questionnaire was gathered from three similar studies done in Saudi Arabia, India, and Iran. The content validity of the study was done by a committee of two reviewers and upon consultation with two hematologists of the Central Blood Bank of Kuwait. The questionnaire included 39 questions covering 4 areas: demographic data (6 questions), blood donation knowledge (14 questions), attitude toward blood donation (10 questions), and practice, barriers, and motivation (9 questions). A pretest was done among 10 employees of a ministry. Based on the pretest, the word 'altruistic' was clarified as follows: Do you think that blood donation is altruistic (out of the goodness of our heart).The questionnaire needed 10 minutes to be completed. Filled questionnaires were collected, and checked for accuracy or any blank answers at the time of data collection.

Based on the information obtained from the American Red Cross (Donation FAQs) and the Central Blood Bank of Kuwait, lists of correct answers were developed for the 14 questions pertaining to knowledge. Those who had the correct answers were given '1' point for each correct answer and '0' point for incorrect or 'don't know' answers. A composite score of knowledge was computed by adding total points. For the questions related to attitudes were phrased in a 5-point Likert scale, with 5 for "Strongly agree" and 1 for "Strongly disagree". Those who answered "Strongly agree" and "Agree" were considered having a positive attitude and the others having a negative attitude toward blood donation. For each positive attitude, the respondent received '1' point and for each negative attitude, he/she received '0' point. Thus a composite score of attitude was computed.

Sample size estimation

The sample size was estimated using a software called GPower, version 3.0.10. Based on a study in Saudi Arabia [9], the prevalence of blood donation was 53.3%. With 95% confidence, 95% power, and a precision of 7%, the estimated sample size was 893.

Statistical analysis

The data were entered in SPSS, version 23 (Chicago, IL). After cleaning the data for errors, descriptive analysis (such as proportion) was performed for the demographic variables, persons with correct answers of the knowledge questions, and the prevalence of blood donation. Major outcome variables such as prevalence rate, knowledge scores, attitude scores, barriers, and motivations for blood donation were compared by gender, nationality, education, and income. Distribution of the data was assessed and appropriate nonparametric tests were used for variables with non-normal distribution. Categorical data were compared by using Chi-square test. Blood donation experience was classified into two groups: those who donated ever in life and those who did not. Univariate and multivariate logistic regression tests were performed to find out the predictors of blood donation from a number of demographic variables, knowledge scores, and barriers. A p-value of 0.05 or less was considered statistically significant.
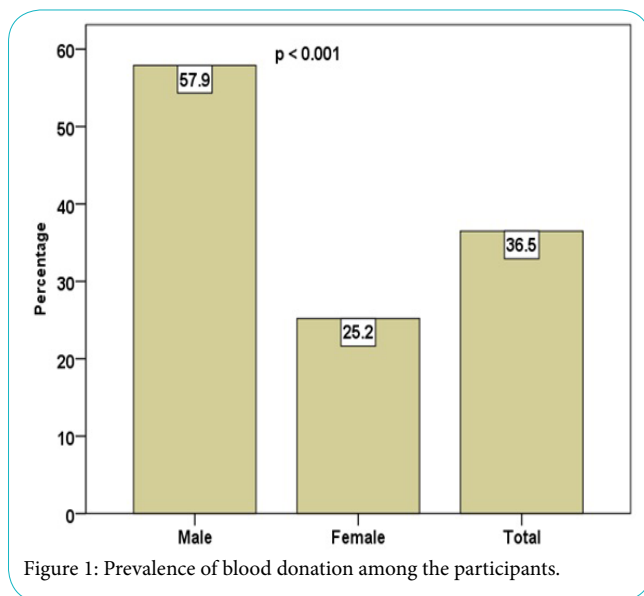
Results

Demographic characteristics

The study included 920 participants and 5 were excluded because of incomplete data. The results are presented for 915 people. Their demographic characteristics are presented in Table 1. The mean ± *SD* of age was 32.8 ± 8.7, ranging from 18 to 75 years. Only 20% of the participants were below 25 years of age, 69% were from 25 to 44 years, and 11% were more than 45 years. Females (65%) and Kuwaitis (86%) predominated the respondents. Majority (86%) of the people had either a diploma or a bachelor or higher degree. Seventy one percent of the people had a monthly income of more than 1,000 *KD* (1KD = 3.3 US$).

Prevalence of blood donation

Figure 1 shows that 36.5% of the study population ever donated blood. The proportion of life-time donors was significantly higher among males than females (57.9% vs. 25.2%, respectively, *p*< 0.001).

Figure 1: Prevalence of blood donation among the participants.

Variables	No. (%)
Age (year), mean ±*SD* (range)	32.8 ± 8.7 (18 – 75)
Age group (year)	
<25	173 (20.0)
25 – 44	595 (68.8)
≥45	97 (11.2)
Gender	
Male	318 (34.8)
Female	595 (65.2)
Nationality	
Kuwaiti	784 (85.8)
Non-Kuwaiti	130 (14.2)
Education level	
High school or below	128 (14.0)
Diploma	356 (38.9)
Bachelor or more	430 (47.0)
Family income (KD)	
<1,000	264 (29.0)
1,000 – 1,499	323 (35.5)
1,500 – 1,999	134 (14.7)
≥2,000	188 (20.7)

Table 1: Demographic characteristics of the participants (n = 915).

1 Kuwaiti Dinar (KD) = US $3.3

Among those who donated blood, 40.2% donated once, followed by 25.5% twice, 14% three times, and 20.2% more than three times during their life. Non-Kuwaitis had significantly higher prevalence of donating blood compared to Kuwaitis (57.0% vs. 33.2%, respectively, p< 0.001).

The rate of blood donation increased with the increase in the educational level of the participants. It was highest among of individuals with bachelor degree and higher level of education (42.6%), followed by individuals with diploma (32.9%) and the least among individuals with high school and lower level of education (27.3%) (p = 0.001).

For the first-time donors, the main reason for donation of blood was volunteering (81.8%), followed by pleasing God by doing a humanitarian work (66.6%), family or friend's need (44.5%), response to a call from an organization (30.8%), and for medical reason (unspecified) (16.9%).

Knowledge about blood donation

As shown in table 2, 74% of the people (679/915) answered correctly that someone with an infectious disease (such as hepatitis, malaria, or syphilis) should not donate blood. More than 50% of the people also mentioned the following statements correctly: those persons with any blood group type can donate blood; anemic people are not allowed to donate blood; blood donation does not cause anemia; lab testing for donor's blood is mandatory before transfusion; and that pregnant women should not donate blood. Less than 25%

Variable	Correct answer[1]	No. (%) correct answer
Someone with an infection can donate blood	No	679 (74.2)
Any blood group can donate blood	Yes	634 (69.4)
Someone with anemia can donate blood	No	611 (66.8)
Blood donation can cause anemia	No	603 (66.0)
Lab testing for donor's blood is mandatory	Yes	587 (64.2)
Pregnant women can donate blood	No	487 (53.3)
Women can donate blood while menstruating	No	450 (49.4)
Someone with diabetes and taking insulin can donate blood	No	365 (40.0)
Blood donation can cause infection to the donor	No	359 (39.4)
Earliest age for blood donation	18 years	356 (39.0)
Someone with high uncontrolled blood pressure can donate blood	No	225 (24.6)
Blood donation can cause infection to recipient	No	135 (14.8)
How often one can donate blood	2 months	112 (12.4)
Volume of blood usually taken for blood donation	450 ml	87 (9.7)

Table 2: Blood donation knowledge of the participants (n = 915)

[1]Based on information from American Red Cross and the Central Blood Bank of Kuwait.

of the people responded it correctly that someone with high and uncontrolled blood pressure is not allowed to donate blood, and that blood donation does not cause infection to the recipient as the blood is screened before transfusion. They also had poor knowledge about the time interval between two times of donation and the amount of blood taken each time for donation.

When compared with the demographic variables, knowledge scores were significantly higher among females ($p = 0.035$). The scores also increased with increasing age of the people ($p<0.001$), and with education ($p< 0.001$).

Attitude towards blood donation

Table 3 shows gender differences in attitudes toward blood donation. Of the 10 questions, 90% of the people considered that his/her donation will encourage others to donate blood. A similar proportion of people expressed that blood donation make them happy as they are helping others. About 88% considered blood donation as altruistic, that means it is out of the goodness of one's heart. Over 75% considered blood donation as a national duty, and 62% viewed it as a religious duty. Only 37% expressed the need of incentives or rewards for donating blood. Females expressed significantly higher attitude toward blood donation if they are given leave from work ($p = 0.006$) or if a lab test is done to evaluate their own health ($p = 0.001$), when compared with their male counterparts.

Attitude	Gender		P-value[2]	Total
	Male n (%)	Female n (%)		
Your donation will encourage others to donate blood	279/318 (87.7)	541/592 (91.4)	0.082	820/910 (90.1)
Blood donation make you feel happy as you are helping a friend or a family member	271/307 (87.7)	535/591 (90.5)	0.21	806/900 (89.6)
A lab test is done with the donated blood to evaluate your health	259/314 (82.5)	533/589 (90.5)	0.001	792/903 (87.7)
Blood donation is altruistic	262/314 (83.4)	521/591 (88.2)	0.052	781/905 (86.5)
Would you donate if you are assured that the blood will be given to you or your family in the future	252/318 (79.2)	499/591 (84.4)	0.054	751/909 (82.6)
Blood donation is a national duty	234/313 (74.8)	446/591 (75.5)	0.81	680/904 (75.2)
Encouraged by your family members or friends	232/314 (73.9)	407/589 (69.1)	0.15	639/903 (70.8)
Blood donation is a religious duty	210/311 (67.5)	351/589 (59.6)	0.02	561/900 (62.3)
Encouraged to donate blood if you are given leave from work	150/312 (48.1)	342/591 (57.9)	0.006	492/903 (54.5)
Will donate blood if there were incentives or rewards	108/313 (74.8)	224/591 (37.9)	0.35	332/904 (36.7)

Table 3: Difference in positive attitudes[1] toward blood donation by gender.

[1]Those who answered "Strongly agree" or "Agree" were considered having positive attitudes;
[2]Chi-Square Test.

Barriers of blood donation

Table 4 demonstrates the major barriers of blood donation as follows: fear of getting new infections (46%), not having enough time for donation (44%), medical issues (40%), fear of pain (38%), fear of anemia (33%), family discourage (32%), fearof seeing blood (30%), and difficulty in accessing blood donation center (29%). Of these barriers, women had significantly more fear of pain ($p<0.001$) and fear of seeing blood ($p= 0.002$) compared to men.

Barriers	Gender		P-value	Total
	Male n (%)	Female n (%)		
Fear of pain	79 (27.7)	229 (42.6)	<0.001	308 (37.5)
Fear of getting new infections	126 (43.8)	261 (47.5)	0.296	387 (46.2)
Fear of seeing blood	66 (23.2)	181 (33.5)	0.002	247 (29.9)
Fear of anemia	91 (31.6)	183 (33.5)	0.587	274 (32.8)
Family discourage	86 (29.7)	183 (33.4)	0.270	269 (32.1)
No access to the blood bank	87 (29.9)	151 (27.7)	0.520	238 (28.5)
Not enough time	127 (43.3)	248 (44.8)	0.692	375 (44.3)
Medical issue	96 (32.8)	243 (43.9)	0.002	339 (40.0)

Table 4: Difference in barriers of blood donation by gender.
Chi-Square Test

Most of the factors that the people thought would motivate people toward blood donation included relative's or friend's need of blood (96.5%), having blood donation clinic in primary polyclinics (91.2%), campaign or advertisement in the social media (91.0%), and having more blood bank branches with a membership program (88.6%).

Univariate and multivariate models for determinants of blood donation

Table 5 shows both univariate and multivariate models for the predictors of blood donation. Those who ever donated blood was coded "1" and those who did not donate blood was coded "0", and the association of blood donation was assessed for the demographic variables, knowledge score, and perceived barriers. The variables that were significant in the univariate model included: male gender, non-Kuwaiti nationality, age-group 25-44 and older, bachelor degree and more education, and knowledge scores. Of the barriers which negatively predicted blood donation were fear of pain, fear of seeing blood, fear of anemia, and no access to the blood bank.

In multiple logistics regression model, the variables that remained significant after controlling for the confounders included male gender ($p< 0.001$), age group 25-44 ($p = 0.006$), age group 45 and older ($p<0.001$), knowledge scores ($p< 0.001$), fear of getting new infection ($p = 0.05$), and fear of anemia ($p = 0.002$).

Discussion

In this study, the prevalence of blood donation was 36.5%. Among those who ever donated blood, 40.2% donated once, followed by 25.5% for two times, 14% three times, and 20.2% for more than three times. Male gender, increasing age, a better knowledge score, and some barriers independently predicted the decision of blood donation.

Variables	Univariate		Multivariate	
	Crude *OR* (95% *CI*)	*P*-value	Adjusted *OR*[1] (95% *CI*)	*P*-value
Gender				
Female (reference)				
Male	4.09 (3.05, 5.47)	<0.001	5.41 (3.69, 7.93)	<0.001
Nationality				
Kuwaiti (reference)				
Non-Kuwaiti	2.67 (1.83, 3.91)	<0.001	1.13 (0.66, 1.93)	0.66
Age group (year)				
< 25 (Reference)				
25 – 44	3.00 (1.81, 4.98)	<0.001	2.28 (1.26, 4.14)	0.006
≥ 45	7.27 (3.88, 13.61)	<0.001	3.76 (1.77, 7.97)	<0.001
Education level				
High school or below (reference)				
Bachelor or more	1.97 (1.28, 3.04)	0.002	1.18 (0.63, 2.21)	0.60
Knowledge score	1.17 (1.11, 1.24)	<0.001	1.23 (1.14, 1.33)	<0.001
Fear of pain				
No (reference)				
Yes	0.73 (0.54, 0.98)	0.038	1.04 (0.67, 1.68)	0.86
Fear of getting infection				
No (reference)				
Yes	0.97 (0.74, 1.31)	0.92	1.49 (1.1, 2.22)	0.05
Fear of seeing blood				
No (reference)				
Yes	0.69 (0.50, 0.95)	0.02	0.67 (0.42, 1.06)	0.08
Fear of anemia				
No (reference)				
Yes	0.56 (0.41, 0.76)	<0.001	0.49 (0.32, 0.76)	0.002
Lack of access to the blood bank				
No (reference)				
Yes	0.70 (0.51, 0.97)	0.031	0.99 (0.63, 1.55)	0.96

Table 5: Univariate and multivariate factors associated with blood donation.

CI, confidence intervals; [1]Adjusted for demographic variables, age, education, knowledge score and barriers.

The prevalence of blood donation among the ministry employees in this study was similar to the blood donation practice observed in Pondicherry, India [16]. Males dominated in blood donation inseveral studies [9, 16-19] including ours. In Saudi Arabia, the rate of blood donation in males was five times as common as in females (66% vs. 13.3%, respectively, p<0.001) [9]. Another study in Saudi Arabia [20]showed that 76% of the donors were males. Similarly, males outnumbered the females in blood donation (67% vs. 33%, respectively) in Iranian population [15].

Rate of blood donation increased with increasing age in our study. A study in Saudi population showed similar results, with 31.8% of donors being between 15-30 years, 41.5% between 30-45 years, and 61.1% between 45-60 years of age [20].

The present study showed an overall poor rate of knowledge regarding blood donation among the general population, which highlights the importance of educating people further by organized outreach approaches, possibly targeting local polyclinics where most of the people attend for their health care, and through educational campaigns and blood donation campaigns organized through the Central Blood Bank in the country.

Specific problem areas of lack of knowledge identified in this study were about transmission of infections, time gap between each blood donation, eligibility of the donors with or without specific health problems, and eligibility of women during pregnancy and menstruation. Unfortunately, there is inconsistent information about some of these issues in the available resources. Another interesting finding was that females presented with better knowledge scores than their male counterparts despite the fact that the prevalence of blood donation was less common among females. This could reflect an overall better educational status of females in this country.

In our study, the knowledge scores increased significantly with education in univariate analysis. However, the association of blood

donation with educational levels was not statistically significant when adjusted for the confoundersin multivariate model. The study conducted in Pondicherry, India mentioned earlier [16] compared knowledge of the health workers with that of the general population. In that study, as expected, the authors found a significant difference in knowledge about blood donation between health professionals and the general population. However, there was no difference in attitude toward blood donation between the two groups. Another study in Nigeria [19], targeting health workers at the University of Benin showed that healthcare workers had a good knowledge and positive attitude towards blood donation, but no significant association was observed between level of education and blood donation in that study.

The results of our study showed that in general there is a positive attitude towards blood donation among the general population. Similar to our study, Waheed et al. (2015) [17] showed a positive attitude towards blood donation in Pakistan, which was attributed to altruism and motivation by friends and family or blood donors. Only 36.8% in our study opined in favor of incentives or rewards, and 54.5% strongly suggested for a short leave from their work for blood donation. Policy makers may consider some of these suggestions for further improvement of the situation based on the nature of work of the people.

One of the unique findings in our study was the identification of several barriers which prevented people from donating blood. These barriers included the fear of getting new infections, fear of anemia, family discourage, and difficulty in accessing blood donation centers, most of which are amenable for intervention in the country. The results of this study were similar to a study done in the United States targeting African American students [21]. The later showed that the major reasons for not donating blood were ineligibility due to medical reasons, fear of needles and pain, and inconvenience. Blood donation agencies should take serious attempts to lessen the myths, fears, and wrong conceptions about dangers of blood donation [22]. As suggested by almost the entire participants in our study, policy makers may consider using campaigns/advertisements in the social media, opening makeshift blood bank caravans near or inside the shopping malls, and having more blood bank branches with a membership program in each primary polyclinic in Kuwait.

This study had some limitations. Our data collection instrument was not an objective measure since it relied on self-reported response of the people, which may be susceptible to information bias. Temporal association of knowledge and attitude on blood donation practice cannot be definitely established due to the nature of the cross-sectional study design. However, the process of a random selection of five ministries from a list of all ministries for this study could eliminate any selection bias. Moreover, because the employees of the ministries represent a wider range of general population, and because the sample size was quite large, the study results are generalizable to the Kuwaiti population.

Conclusion

This study results demonstrated a low prevalence of blood donation among the general population in Kuwait. Although the people's average knowledge about blood donation was only 44.5%, females had a better knowledge score than the males. The decision of blood donation was significantly associated with male gender, increased age, better knowledge scores, and negatively related with fear of getting new infection and fear of anemia.

Policy Implications

Based on the findings of this study, it is recommended that appropriate national education programs regarding the benefits and needs of blood donation should be advocated. This will improve population' knowledge on blood donation, alleviate the perceived barriers, and increase the practice. Since the media has an important role in motivating the population, the study recommends using the education campaign through the social media, as mentioned by most of the study participants.

Acknowledgement

Competing Interests

The authors declare that they have no competing interests.

Author Contributions

The main hypothesis and the research idea was initiated by AM, who was the mentor and the supervisor of this research. Each author contributed substantially in data collection, analyses, and preparation of the first draft. The final draft was prepared by AM, and was edited by each author before submission.

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