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Assessment of knowledge, attitude and practice of female's employees about cholera at Sana'a university, Yemen

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Abstract
Cholera is an acute bacterial enteric disease characterized in its severe form by sudden onset, profuse painless watery stools, nausea, and vomiting. **Aim of Study:** to assess the knowledge, attitude and practice of female's employees about cholera at Sanaa university, Yemen. **Subject and Method:** descriptive cross sectional research design was carried out in the study. **Sample:** include 230 female's employees at Sanaa university Yemen. **Tools:** Interview questionnaire was used which include three tools have been used first tool which include two parts: part one includes sociodemographic characteristics, part two used to assess knowledge about cholera, second and third tools used to assess attitude and reported practice of females about cholera disease. **Result**: the study clear that age of female participant means ± SD was 32.85± 5.84, poor level of knowledge about cholera was observed among (75.5%), the majority of study sample had negative attitude toward cholera while only 30% of them had poor practice. Also, there is statistically significant difference between level of education of female's employee with their knowledge and practice. **Conclusion:** The study revealed that poor level of knowledge, negative attitude and poor practice about cholera among female's employees at Sanaa university in Yemen. **Recommendations:** The present study recommended implement awareness campaigns and educational programs in universities to estimate the level of knowledge toward cholera disease, also vaccination against cholera, and to warn from the hazards of cholera outbreaks.

Keywords: Attitude, Cholera , Knowledge & Practice

Introduction:
Cholera is defined as an acute bacterial infection that is caused by Vibrio Cholera. The main clinical feature for cholera is the watery diarrhea, although the causative bacteria has above 200 serotypes, only two serotypes are prevalent in poor sanitary and hygienic conditions **(Ali et al., 2021).**

Globally in 2017 WHO received 129064 reported cases of cholera from 47 countries in total. The actual reality of the cases is feared to be much higher **(Sharp, 2017).**

One of the major problems troubling the World Health Organization (WHO) is the Yemen conflict and crisis. For the WHO, the recent issue is the Cholera outbreak in Yemen and particularly Sana'a, the capital city of Yemen. The cholera outbreak in Yemen began in October 2016. It has been described as "the worst cholera outbreak in the world". By both WHO and UNICEF. It is characterized by an unusual rapid and wide geographical spread as well as a high case count **(WHO, 2017).**

Yemen is dealing with a severe and rapidly spreading cholera outbreak, which threatens to exacerbate the country's already dire humanitarian situation, the lack of a functioning health system, as well as limited access to safe water and hygiene, pose a threat to effectively controlling disease transmission. Yemen has a population of 18.9 million people, with 14.5 million in need of humanitarian assistance. with 14.5 million lacking access to safe water and environmental sanitation services. More than half of all health facilities in Yemen are closed or partially functioning as result of the conflict **(Sharp, 2017).**

Risk factors a) Poor social and economic environment and unstable living conditions, associated with: insufficient water supply (quantity and quality); poor sanitation and hygiene practices; high population density – refugees/internally displaced person's camps and urban slum populations are highly vulnerable; vulnerability – pregnant women, children under five, and immune compromised people (e.g. HIV & AIDS patients) have increased risk. b) Underlying diseases and conditions: as malnutrition and chronic diseases such as tuberculosis and AIDS can increase susceptibility to cholera. c) Gender: Women are often more at risk of cholera than men because they tend to be responsible for caring for those who are sick in the home and may not be aware of the necessary precautions to prevent transmission **(WHO, 2017)**

The primary symptoms of cholera are profuse diarrhea and vomiting of clear fluid, these symptoms usually start suddenly, half a day to five days after ingestion of the bacteria **(Mutreja A., 2020).**

Shock and severe dehydration are the most devastating complications of cholera, other problems can occur, such as hypoglycemia **(Martin et al., 2012) .**The spread of cholera is accelerated by poor sanitation, contaminated food, and contaminated water as result of a lack of knowledge, a negative attitude, and unsanitary living practices., all these scenarios are common in overcrowded areas **(Wahed et al., 2013).**

Caregivers, childcare workers, and others who regularly interact with vulnerable populations may be taught best practices for disease prevention. Presentations to local groups can teach individuals how to care for themselves, keep their families safe and prevent diseases from spreading. These and other campaigns need the specialized knowledge and skills of public health nurses **(CDC, 2016).**

Nurses have an important mission to convey information about risk factors, detection of early signs of cholera outbreak and encourage women to have a regular taught best practice for disease prevention. This can be achieved by conducting additional educational programs for nurses who is considered a vital role in the healthcare delivery system **(WHO, 2017)**

Significance of the Study:

The spread of cholera in Yemen is becoming more common as a result of a lack of clean water, which is regarded as one of the primary causes of the rise in diarrheal diseases, according to reports, contaminated water plays a significant role in the spread of diarrhea. According UNICEF (2019), 2,500 children under the age of five die globally every day because of diarrheal diseases. in which 90% of the deaths are directly linked to poor sanitation and contaminated drinking water.

The aim of the study:

The assess the level of knowledge, attitude, and reported practice of female employees about cholera at Sanaa University.

Research questions:

1. Is there low-level knowledge about cholera among Female's employees?
2. Female's employees may have poor level of practice related to cholera.
3. Female's employees may have negative attitude towards cholera.

Subject and Methods:

Study design: Descriptive study that was carried out in this study.

Time of the study:

The data collection carried out during the period from the 1st of January 2020 to 1st June 2020.

Setting: the study conducted at Sana'a university was established in 1970 as the first and the primary university in the Republic of Yemen, It is located in Sanaa, the capital of Yemen, and is currently organized with 13 faculties.

No	Name of Faculties	Sample Size	No	Name of Faculties	Sample Size
1	Faculty of Medicine	25	**8**	Faculty of Commerce & Economics	21
2	Faculty of Pharmacy	33	**9**	Faculty of law	14
3	Faculty of Dentistry	24	**10**	Faculty of Languages	13
4	Faculty of Engineering	17	**11**	Faculty of Science	15
5	Faculty of Agriculture	23	**12**	Faculty of Mass Media	17
6	Faculty of computer science	11	**13**	Faculty of Art	11
7	Faculty of Education	19		**Total**	**243**

Sample size: Sample size was calculated using odds ratio of different of low level of knowledge about cholera from previous studies, with the software EPI/Info, version 3.3 with 95% confidence interval (CI), and power 80% of the test. It was found to be 230 women.by convenient sample for female's employees who worked at Sanaa university, Yemen.

Tools of data collection

Interview questionnaire sheet was used based on reviewing of the relevant literature information usually taken directly face to face from the participants.

Three tools were used:

Tool (I) includes two parts:

Part (1): It was included socio-demographic characteristics as, age, marital status, residential, level of education numbers of rooms in the house, number of people in house and Source of information etc., according to Abdel Tawab scale **(AbdelTawab, 2012)**

Part (2): knowledge female's employees about cholera: It included 18 items about cholera disease. To measure knowledge, the score was given 1 point for correct answer, 0 point for incorrect answer. after summing up the total knowledge scores of respondents based on percentage, the knowledge level was classified into three levels as following: poor knowledge if the score is less than 50%, fair knowledge if score is 50%- 70%, and good knowledge if score is more than 70% **(AlKalidi, 2017).**

Tool (II): Attitude scale: according to Likert scale (**State., 2017).** It was designed to assess female's attitudes regarding cholera, it had twenty-two items and each item has three responses ranging from agree to disagree.

This section included statements concerning the risks of cholera and cholera immunization ("cholera is very serious for adult or children", "there may be sideeffects of cholera vaccination"), perceived efficacy of various prevention measures (e.g., hand washing and proper sanitation practices), and the benefits of cholera Immunization ("immunizations are effective in the prevention of disease"). There are many items toward cholera infection attitudes, and each item have modified to three responses ranging from agree, disagree and certain. The total score is classified into negative attitude if the score is less than 60% and positive attitude if the score is equal or more than 60%.

Tool (III) Reporting practice:

Reporting checklist was designed to observe practice of females' employees developed by the researchers to collect data related to female's reporting practice as regard the safety water, hand washing, waste disposal and method of food preservation …. etc . It includes ten questions, The total score is classified into poor practice if the score is less than 50%, fair practice if score is 50%- 70%, and good practice if score is more than 70% **(Wahed et al., 2013).**

The Validity of Tools:

The tools were translated to Arabic language and reviewed to ascertain their validity by the panel of five experts from community health nursing staff at Assiut University, who reviewed the tools for clarity, relevance, and comprehensiveness, understanding, and applicability.

Reliability Test:

Reliability is applied by the researchers for testing the internal of the tool, by administration of the same tools to the same subjects under similar conditions two times 15 days apart. Cronbach's Alpha reliability for knowledge was 8.21, attitude was 7.95 and for practice were 8.85.

Methodology:

Approval and official permission: An official approval letter was obtained from the Dean of Faculty of Nursing, Assiut University to the director of president of Sana'a University. This letter was included a brief explanation of purpose of the study.

Filed work:

Data collection and field of the work

The data collection carried out during the period from the 1st of January 2020 to 1st June 2020 at Sanaa university in Yemen.

Researcher took three days each week, 7 - 8questionnaire sheet per day. The researcher introduced himself to the vice deans for females employees at each selected faculties, and reminded them of the nature and purpose of the study. The researcher was taken oral permission from the females employees to participate in study . then the researcher asked them about preferred time for data collection, either in the first or last part of thir works. Researcher introduced himself to the female's employees and explained the purpose and nature of the study and explained the main parts of the questionnaire were distributed to them. After that, the questionnaire was distributed to the female's employees by the researcher. Filling of questionnaire took 20-25 minutes by the female's employees. Finally, the researcher thanked the female's employees and their faculties deans for their cooperation

Pilot Study:

Before beginning data collection, a pilot study was conducted on 10% include 23 of the female employees included in the sample. The goal of the pilot study was to identify any specific issues with the clarity of the statements, estimate the time required to complete the questionnaire, and assess the tool's applicability.

Ethical consideration:

The Ethical Committee of Assiut University's Faculty of Nursing approved the research proposal. During the application of the research, there is no risk to the study subject. The females' of the study's objectives was informed, and they are free to refuse participation in the current study. The target's oral consent was obtained. The confidentiality of the obtained information was used only for the purpose of the study. clarity of the tools and estimate the required time to fill the questionnaires.

Statistical analysis:

The obtained data was reviewed, prepared for complete entry coded, analyzed and tabulated by using SPSS version 21 (Statistical Package for Social Science). Data were presented as number, percentage, mean, standard deviation. Chi-square test was used to compare between qualitative variables. Pearson correlation was done to measure correlation between quantitative variables. Statistical significance was considered at p value were less than 0.005 ($P < 0.05$)

Result:

Table (1): Sociodemographic characteristic of female's employees in Sanaa University Yemen, 2020

Sociodemographic characteristic	No. (230)	%
Age: (years)		
< 30	72	31.3
30 - ≤35	78	33.9
> 35	80	34.8
Mean ± SD (Range)	**32.85 ± 5.84 (20.0-47.0)**	
Residence:		
Urban	88	38.3
Rural	142	61.7
Marital status:		
Single	56	24.3
Married	145	63.0
Divorced	15	6.5
Widowed	14	6.1
Level of education:		
Illiterate	19	8.3
Basic education	16	7.0
Secondary	57	24.8
University	107	46.5
Postgraduate	31	13.5
Social class:		
Low	117	50.9
Middle	75	32.6
High	38	16.5
Number of bedrooms:		
One	71	30.9
Two	71	30.9
Three	74	32.2
Four	14	6.1
Number of family members:		
2 – 3	56	24.3
sociodemographic characteristic	**No. (230)**	**%**
4 – 5	96	41.7
> 5	78	33.9
Source of information		
T.V or Radio	134	58.3
Books or Journals	37	16.1
Physician or Nurse	111	48.3
Net or Mass Media	77	33.5
Source of Water		
Shallow wells	32	13.9
Lake	43	18.7
Running water	123	53.5
water barriers	91	39.6

Table (2): knowledge of female's employees regarding Cholera in Sana'a university Yemen, 2020

Females' employee's knowledge	No	%
Cholera Definition		
Correct	106	46.1
Incorrect	124	53.9
Characteristics of cholera's bacteria		
Correct	97	42.2
Incorrect	133	57.8
Signs and symptoms of cholera		
Severe diarrhea	173	75.2
Severe vomiting	87	37.8
Excessive thirst	53	23.0
Low blood circulation	67	29.1
Anuria	51	22.2
Don't know	41	17.8
Mode of transmission of cholera infection		
Contaminated water	69	30.0
Contaminated food	135	58.7
By Flies	64	27.8
Don't know	73	31.7
Diagnosis of Cholera		
Signs and symptoms	118	51.3
Stool analysis	91	39.6
Don't know	64	27.8
Treatment of Cholera		
Rice saline	53	23.0
Diarrhea treatment center, hospital and clinic	63	27.4
ORS	157	68.3
Don't know	44	19.1
Cholera Vaccination		
Cholera control and reduce by vaccine.	80	34.8
Oral vaccine divided to two doses	97	42.2
Don't know	98	42.6
cholera Prevention:		
Use of potable water	173	75.2
Adequate sanitation Health education	88	38.3
Food safety	91	39.6
Basic hygiene practices	99	43.0
Don't know	21	9.1

Table (3): Total score of Female's Employees Knowledge regarding cholera in Sanaa University Yemen,2020

Knowledge level	No.	%
Good	0	0.0
Fair	56	24.3
Poor	174	75.7
Mean ± SD	**20.96 ± 3.95**	

Table (4): Total score of Female's Employees attitude regarding cholera in Sanaa University Yemen, 2020

Attitude Level	No.	%
Positive	14	6.1
Negative	216	93.9
Mean ± SD	15.38 ± 4.37	

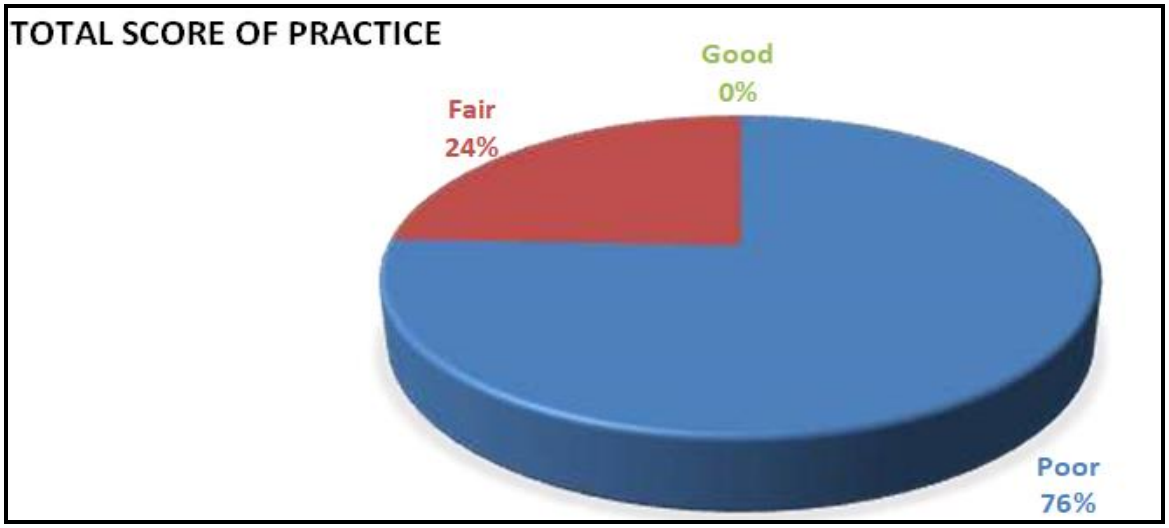

Figure (1): Total score of Female's Employees practice regarding cholera in Sanaa University Yemen,2020

Table (5): Association between socio Demographic characteristic of Female's Employees with knowledge, attitude, and practice about cholera at Sanaa University ,2020

Demographic characteristic	Knowledge score	Attitude score	Practice score
	Mean ± SD	Mean ± SD	Mean ± SD
Age: (years)			
< 30	18.65 ± 3.46	14.44 ± 4.13	9.31 ± 2.05
30 - ≤35	20.17 ± 3.79	15.11 ± 3.98	9.42 ± 1.61
> 35	21.11 ± 4.41	16.53 ± 4.74	9.44 ± 2.06
P-value	0.014*	0.011*	0.899
Residence:			
Urban	21.32 ± 4.16	16.02 ± 4.22	9.53 ± 2.03
Rural	19.38 ± 3.53	13.99 ± 4.42	9.30 ± 1.82
Demographic characteristic	Knowledge score	Attitude score	Practice score
	Mean ± SD	Mean ± SD	Mean ± SD
P-value	0.027*	0.020*	0.372
Marital status:			
Single	21.34 ± 3.97	14.63 ± 4.28	9.16 ± 1.98
Married	20.68 ± 3.93	15.51 ± 4.36	9.47 ± 1.92
Divorced	20.73 ± 3.15	17.47 ± 4.36	8.93 ± 1.62
Widowed	22.64 ± 4.72	14.86 ± 4.47	10.00 ± 1.71
P-value	0.279	0.143	0.341
Level of education:			
Illiterate	17.84 ± 3.67	12.81 ± 3.31	8.48 ± 1.86
Basic education	18.25 ± 3.04	13.26 ± 3.45	9.11 ± 1.70
Secondary	19.47 ± 3.78	13.39 ± 4.59	9.53 ± 2.03
University	20.61 ± 4.01	14.03 ± 4.64	9.50 ± 1.90
Postgraduate	21.06 ± 4.46	16.97 ± 3.79	9.89 ± 1.87
P-value	0.002*	0.011*	0.030*
Social class:			
Low	18.26 ± 3.86	15.12 ± 4.09	9.38 ± 1.98
Middle	20.41 ± 4.13	15.45 ± 4.74	9.43 ± 1.75
High	21.11 ± 3.88	16.05 ± 4.47	9.34 ± 2.00
P-value	0.037*	0.514	0.974

**statistically significant differences*

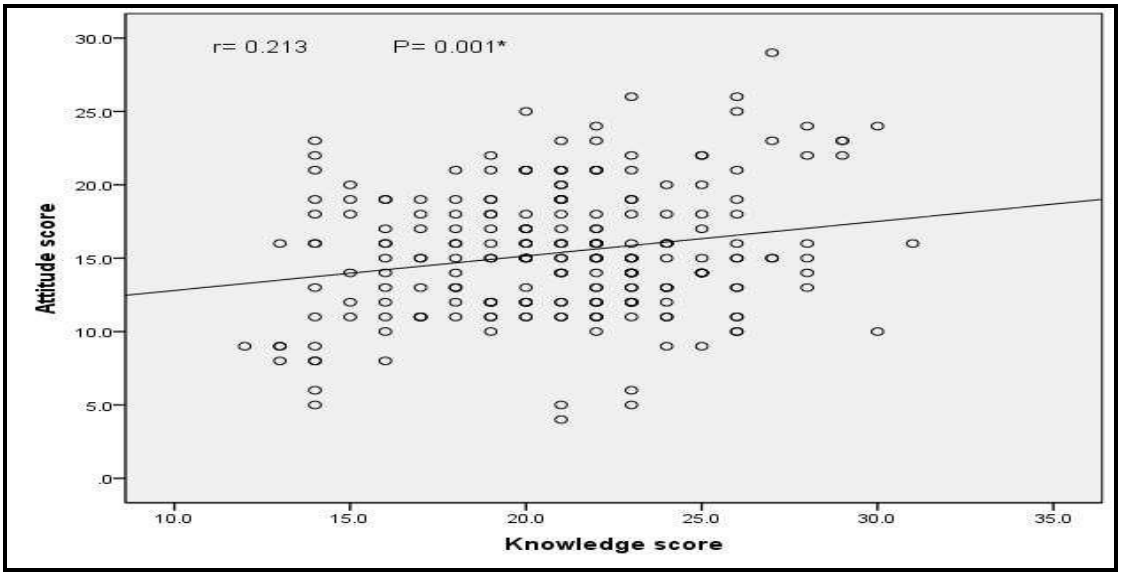

Figure (2): Correlation between total score of knowledge and attitude about cholera among Female's Employees in Sanaa University ,2020

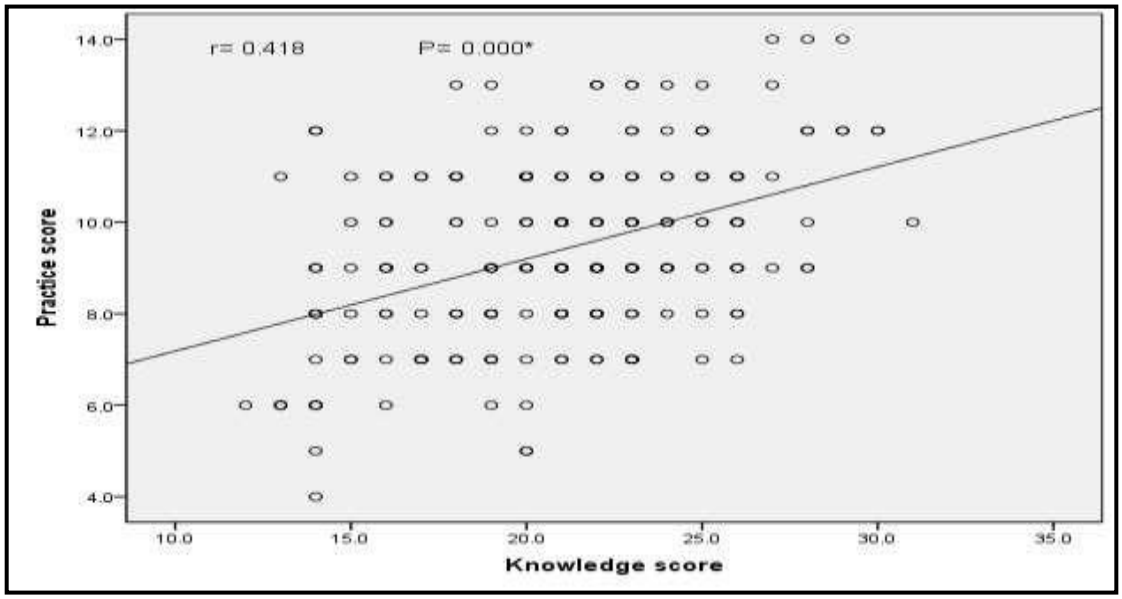

Figure (3): Correlation between total score of knowledge and practice about cholera among Female's Employees in Sanaa University, 2020

Table (1): Illustrates the distribution of some socio-demographic characteristic of studied female's employees. It was cleared that 33.9% of studied female's their age from 30 to 35 years old, also (34.8%)of them was more than 35 years, with mean = 32.85 ± 5.84. Also, the table showed that 61.7% of studied female's employees was from rural areas. As regard to education of female's employees. It was found that 46.5%of studied female's employees was university, and24.8% was secondary school. Concerning to number of bedrooms, it was observed that more than half (32.2%) of studied female's employees lived in 3 rooms, and 41.7% of studied female's employees was four to members in family. Moreover, the table showed that regarding source of water, it was observed that 53.5% of studied female's employees running water is the first source of water.

Table (2): Illustrates that knowledge of females' employees' regarding cholera disease. It reveals that(53.9%) of females' employees' have incorrect response about the definition of cholera disease. Regarding mode of transmission, 31.7% of participants knew about cholera transmitted by contaminated food. Also, more than half of

participants (51.3%) knew that the diagnosis of cholera by signs and symptoms. Concerning to signs and symptoms of cholera, the findings reveals that (75.7%) of studied female's employees knew about the severe diarrhea is sign of cholera disease, followed by 37.8% knew the severe vomiting, moreover three quarters of participants 75.5.0%, knew cholera is prevented by use of potable water.

Table (3): Shows the total knowledge score of the female's employees about Cholera disease, it was observed that 75.7% of female's employees had poor knowledge and 24.3% from them had fair knowledge.

Table (4): Shows the total attitude score of the female's employees about Cholera disease, it was observed that about two thirds 93.9% of female's employees had negative attitude and 6.1% of them had positive attitude.

Figure (1): Shows the total practice score of the female's employees about Cholera disease, it was observed that about 30% of female's employees had poor practice, 74.8% of them had fair practice and 5.2% from them had good practice.

Table (5): Statistically significant differences were found between female's employee demographic characteristic and female's employee's knowledge, attitude and practice about cholera epidemic. Regarding level of education, it was observed that high Statistically significant difference (P=0.002,0.011,0.030) respectively. Reveals the relation between total score of the female's employee's knowledge, attitude and practice about Cholera and demographic characteristics .

Figure (2): In this figure, there was positive correlation between the score of knowledge and score of attitudes in the study sample with statically significant (r= 0.213 & P= 0.001).

Figure (3): In this figure, there was positive correlation between the score of knowledge and score of practices in the study sample with statically significant (r= 0.418 & P= 0.000).

Discussion:

Cholera disease is a bacterial infection of humans caused by V. cholera, a Gram- negative bacillus divided into more than 200 different serogroups, Cholera continues to be an under-recognized and underreported problem in many endemic countries across the world. Several factors contribute to this underreporting, such as some countries reporting only laboratory-confirmed cases and other countries not reporting cases at all **(AlKalidi, 2017).** Regarding demographic characteristics of the female's employees, the findings of the present study revealed that around one third of participants belong to the age group more than 35years. This finding agreed with other study conducted in Saudi Arabia by **Ali et al., 2021** who reported fifty-fife percent of participants were in the age group 20–40 years. In the current study, around half of participants has university education. The educated persons less affected by faulty knowledge presented by the society and general media. This result agreed with **Al-Sakkaf et al .,2020**, who conducted Cholera knowledge, socioeconomic and wash characteristics in Aden, reported that more than half of participants have university education.

Regarding knowledge of female's employees regarding cholera, the current study revealed that more than half of participants knew the cholera is a bacterial disease transmitted by contaminated food. Other study by **Ogbeyi & Bito, 2017**, who conducted determinants of knowledge, attitude and preventive practices relating to cholera in Nigeria, encouraged this result and stated that the more than half of respondents knew the cholera is a bacterial disease and transmitted by contaminated food.

Regarding diagnosis of cholera , the current study presented that more than half of participants knew that diagnosis of cholera by signs and symptoms ,This result was in the same line with **Alkalidi et al., 2017** who conducted knowledge , attitude and practice on cholera epidemic in al-diwaniya province ,reported that the majority of participants knew that the diagnosis of cholera by signs and symptoms .

The current study found that more than half of the participants had poor knowledge, about cholera disease. This results consistent with a study performed by **Wahed . et al. 2013,** who reported that the majority of participant had poor knowledge regarding Cholera . whether the researcher explained that poor knowledge score might be attributed to the fact of poor educational programs adopted by the national media regarding the general knowledge about infectious disease and cholera in particular and lack of primary health care plays an important factor in education regard prevention of cholera. However, these results disagree with **(Mpazi & Mnyika, 2017)** who reported that the most majority of participants had good knowledge.

The attitude score of the participants enrolled in this study, the majority of participants have a negative attitude, this interpretation of a highly negative value is consistent with **Wahed et al., 2013**. The general population's belief about the negative consequences of ignoring such an infectious disease explains the motivation for this negative attitude score.

Regards reported practice related to hand washing after used toilet the findings of female's employees revealed that more than one-third of participant's hand washing after used toilet. Our study area could have benefitted from health education and advocacy

on hand hygiene conducted during past cholera outbreaks hence the high proportion of respondents who washed hands after defecation and before eating. these present results agreed with **Rochars et al., 2011** who showed that the majority of participant's hand washing after used toilet.

Concerning the relation of knowledge with demographic characteristics, the current study showed that there was statistically significant difference between knowledge of participants and their demographic data. The older age, higher education of them has an effect on the knowledge level ,it appears that the level of education is a prime player in establishment of personal attitude, Practice score proved to be affected by level of education of the person.. This result was in contrast with **Alkalidi et al., 2017** who reported that significant association between knowledge and of level of education. Also, this result disagree with **Wahed et al. 2013**, who reported there was no significant association between knowledge and age.

Regarding the correlation between the female's employee's knowledge and attitude about cholera disease, the present study demonstrated a significant positive correlation between the female's employee's attitude and their knowledge about cholera (r=0.213 &p=0.001). This outcome was consistent with **Ogbeyi & Bito, 2017** who mentioned that the correlation of KAP scores overall revealed a significant positive correlation among knowledge and attitude.

Regarding the correlation between the participant's knowledge and practice about Cholera, the present study demonstrated a significant positive correlation between the females employees knowledge and practice. This outcome was consistent with **Alkalidi et al.,2017**who mentioned that the correlation of KAP scores overall revealed a significant positive correlation among knowledge and practice (r = 0.061 p = 0.001).

Conclusion

The level of knowledge of the female's employees is poor and requires educational program to be improved. Also, the attitudes and practices of female's employees in Sana, a university are considered unsatisfactory. Statistically significant differences were found between female's employee demographic characteristic and female's employee's knowledge, attitude, and practice about cholera epidemic.

Regarding level of education, it was observed that high Statistically significant difference (P=0.002 ,0.011 ,0.030) respectively. There was positive correlation between the score of knowledge and score of attitudes in the study sample with statically significant (r= 0.213 & P= 0.001), also there was positive correlation between the score of knowledge and score of practices in the study sample with statically significant (r= 0.418 & P= 0.000).

Recommendation

The present study recommended that targeted health education to the all employees in Sana,a university about cholera and regular health education in the community to improve knowledge, attitude and preventive practices of cholera. Further similar studies in other areas in Yemen are highly recommended to figure out the real picture for knowledge about cholera in Yemen.

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