



# The Relationship Between Knowledge and Drug Adherence in Hypertensive Patients: A Cross Sectional Study in UAE

Ahmed Abdalla Mohamed Gaili\*, Sundos Qasim Al-Ebraheem, Zakia M. Metwali , Nihal Abdalla and Sara Al –Akshar

College of pharmacy, Ajman University, UAE, Ajman

Date of Receipt- 02/01/2016  
Date of Revision- 20/01/2016  
Date of Acceptance- 08/02/2016

## ABSTRACT

**Objectives:** To Evaluate the relationship between Knowledge and Drug adherence in hypertensive patients in UAE.

**Methodology:** A questionnaire was delivered to random sample of 385 hypertensive patients in Abu Dhabi, Sharjah and Ajman. SPSS version 20 was used for data entry and analysis.

**Results:** Out of the 385 patients, 353 (91.7%) had high knowledge value and scored within the high knowledge category while 32 (8.3%) was considered as having poor knowledge and scored within the poor knowledge category. On the other hand, 325 (84.4%) of the study participants showed good adherence to medication and scored within the positive attitude category while only 60 (15.6%) showed poor adherence to medication and scored within the negative attitude category. Spearman rank order correlation coefficient ( $\rho$ ) between total knowledge score and total adherence score was used to indicate the association between knowledge and adherence among the study participants.

**Conclusion:** The result of the study clearly showed that there was positive correlation between knowledge and drug adherence among hypertensive patients in UAE. Despite this finding, it is believed that medication adherence is a multi-factorial phenomenon and knowledge is only one key of these factors.

**Keywords:** Hypertension, Medication Adherence, Knowledge, UAE.

## Address for Correspondence

College of pharmacy,  
Ajman University,  
UAE, Ajman

Tel. : +97-1506841174

**E-mail:**  
[a.gaili@ajman.ac.ae](mailto:a.gaili@ajman.ac.ae)

## INTRODUCTION

### Background

Hypertension (HTN) is an important public health challenge. Today it is considered as one of the most common chronic diseases in rural, urban and semi urban areas of the world that needs continuous monitoring and treatment throughout the life<sup>1</sup>. HTN is clinically defined as “blood pressure of 140/90 mmHg or more, based on at least two different readings at separate settings”<sup>2-6</sup>

### Prevalence of HTN

#### Worldwide

HTN is a worldwide concern that has a massive impact on population health as it is one of the major risk factors for cardiovascular mortality and morbidity<sup>7,8</sup>. HTN has been found to be the third cause of disability globally<sup>3,7</sup>. HTN affects approximately 1 billion people worldwide (340 million in economically developed countries and 639 million in economically developing countries)<sup>8-10</sup>. The global burden of disease study stated that HTN is the 4<sup>th</sup> contributor to premature death in developed countries and the 7<sup>th</sup> in developing countries<sup>5</sup>.

#### In United Arab Emirates (UAE)

The United Arab Emirates (UAE) has high rates of chronic diseases related to Sedentary lifestyle, such as obesity, diabetes, and cardiovascular diseases (CVDs). CVDs accounted for 36.7% of all death cases in 2013. Without major changes, these rates are set to increase further as the young population ages. Individuals thought to be at high risk of CVDs are being monitored and followed up<sup>11</sup>. The following table developed by the Ministry of Health (MOH) shows the annual percentage of HTN diagnosed in different public health

centres (P.H.C) in the northern emirates across the UAE<sup>12</sup>.

**Table 1:** Percentage of hypertensive cases at P.H.C.

	Du bai	Sharj ah	Aj ma n	U.A .Q	R.A .K	Fujai rah
Hypertensive Diseases	1.94	9.75	5.48	5.25	6.26	4.81

## MATERIALS AND METHODS

### Study design

The default questionnaire (HFQ) used in this study was obtained from a previous study done by *F. Saleem et al 2011*, and a little modification is done to the design so that it will meet UAE sampling criteria.

### Sampling method

Convenience sample was used as a sampling method which involved distribution of the study questionnaire to hypertensive patients that fulfil the inclusion criteria. The sampling method was selected because of their convenient accessibility.

### Sample size

The minimum sample size of the study was calculated using “Raosoft” online sample size calculator (Available from: <http://www.raosoft.com/samplesize.html>). Population of hypertensive patients in UAE (1200000), confidence level of 95% and 5% margin of error were used in calculation. Fifteen percent added to the minimum sample size to avoid decreased sample size than minimum (n=385). The final chosen sample size was 400 to overcome non response and failure to follow up.

### Pilot study

A pilot study of 10 hypertensive patient was conducted to test the validity

and reliability of the questionnaire designed to be used on the main study, determine the time needed by participant to finish the questionnaire and to reveal difficulties in understanding the theme and meaning of the questions. The data of the participants involved into the pilot study were not taken into account in the main study.

#### Data collection

A total of 385 sample questionnaire were collected in the period from September 2014 to January 2015. Patients willing to participate in the study were given the questionnaire to be filled; in addition they were requested to sign the consent form prior to filling the questionnaire. The questionnaire was available in both Arabic and English for those participants who are Arabic national. Participation was voluntary and no benefits or intensives were given to participants. The researcher requested from the participants to fill and submit the questionnaire at the same time to exclude the risk of using the internet and other sources to answer the knowledge questions. Intervening from the researcher where done only to clarify any difficulties in understanding a question and self-effort in answering the questions by the participants was applied.

#### Data analysis

All analyses were performed using SPSS version 20. Identification numbers were given for the collected questionnaire for counting and organizing purposes. All questions were coded and then imported to SPSS for analysis. All variables categories were coded with numbers (for example, gender: male as 1 and female as 2). Descriptive statistics were used to compute the demographic data and it included: mean, Standard deviation and frequency. Spearman rank correlation test was used to measure the

association between knowledge and drug adherence.

#### Ethical issues

Ethical letter to conduct the study was obtained from Ajman University of Science and Technology (AUST) to allow the researcher to distribute and collect the questionnaires among patients in hospitals after taking permission from the hospital manager. Written and signed consent form was obtained from the patients prior to data collection. Confidentiality of the participants was maintained at all time (as the patients were not asked to provide their names). Participants were informed that participation is voluntary and given the right to withdraw from the study at any time they needed.

## RESULTS

A total of 385 patients were included in the study, 209 (54.3%) were males and 176 (45.7%) were females. 32.0% of the study participants were 45-54 years old with the mean age of 46.48 years old. Most of the participants (78.7%) were Arabs (non-UAE national), followed by UAE nationals (13.2%) and 8.1% were from other nationalities. Regarding the educational level, most of the participants had "Bachelor degree" with total of 162 (42.1%), while 1.8% had "PhD". Different occupation were included in the study, 22.9% of the participants were "housewives" followed by "Labours" as 19.2%. About half of the participants were overweight (47.5%), (6.0%) underweight and (46.5%) have normal weight. In the range of family history and disease specification, "HTN" category were the most disease suffered by participants (14.0%), followed by "HTN and Diabetes Mellitus (DM)" category (12.7%) and "DM" category (12.2%). The demographic characteristics of the study participants are listed in **Table (2)**.

**Table (3)** shows the correct responses of the study participants to HFQ in descending order, starting with the question that scored the highest (91.2%) correct response (the question regarding effect of fatty food on cholesterol levels) and ending with the question that scored the least (36.9%) correct response (the question regarding the chances of both men and women to develop HTN).

Knowledge score ranged between 0 and 15. The overall mean of knowledge score was 11.1 with SD of 2.84 (**Figure 1**).

Out of the 385 participants, 353 (91.7%) scored within the high knowledge category, while only 32 (8.3%) scored within the poor knowledge category (**Figure 2**).

Also it has been seen that participants holding the bachelor degree within the level of education category scored the most within the high knowledge category (38%), followed by participants holding diploma or high school certificate (34%) and the lowest is seen in participants that are below secondary school (15%).

The response of the participants to DAI-10 is shown in **Table (4)**.

Starting with the question that scored the highest (83.6%) correct response (I take medications of my own choice.) and ending with the question that scored the least (37.1%) correct response (I take medication only when I am sick.). The overall mean of the adherence score was 6.65 with SD of 2.075 (**Figure 3**).

Out of the 385 participants, 325 (84.4%) scored within the positive drug adherence attitude category while only 60 participants (15.6%) scored within the negative drug adherence attitude category (**Figure 4**).

When we take the participants family history of HTN into account, it has been found that those who had family history of any CVD showed more positive drug adherence attitude in using antihypertensive

medications compared with those who did not experience family history of any CVD.

Spearman rank order correlation coefficient ( $\rho$ ) between total score of knowledge and total score of adherence attitude was used to indicate the association between knowledge and adherence attitude among the study participants. Preliminary analysis performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. According to the result of the equation,  $\rho = 0.182$ , which indicates a direct positive correlation between knowledge score and adherence score. This means that if the knowledge about HTN increases, the drug adherence attitude will also increase.

## DISCUSSION

HTN is a global health hazard that is frequently encountered in clinical practice<sup>13</sup>. It is considered as one of the most prevalent non-communicable disease worldwide, but still the control of the disease is suboptimal<sup>7,14</sup>. Up to our knowledge, this is the first study to be conducted in the UAE in terms of exploring the knowledge and drug adherence among hypertensive patients. The UAE has a diverse and expanding population that is estimated to be around 4.5 million with an average age range of 15-64 years old, the majority of which are expatriates (non-UAE nationals)<sup>15</sup>. There is evidence from the present study that knowledge can indeed have an influence on the level of drug adherence. A number of studies support such an association in which a relationship was found between knowledge and adherence<sup>19-22</sup>. In some cases, knowledge is highlighted to be associated with adherence but only under certain conditions<sup>23</sup>. In contrast, other studies stand against such positive relationship and instead found that knowledge and adherence are negatively correlated and inversely proportionate<sup>7</sup>. The apparent reason for the conflicting outcomes may be due to differences in the concept and definition of

adherence and knowledge. Also, the effect of other factors cannot be ignored too, since adherence is a multi-factorial phenomenon and success or failure of therapy is not dependent on a single factor. Other factors such as age, gender, low socioeconomic status, prescribed drugs, lack of social support, poor patient-provider relationship should also be kept in mind and evaluated before coming to a conclusion. This study found that out of the 385 patients included in the study, (54.3%) were males and (45.7%) were females. These findings are similar to the findings of other similar studies where most of the study population were males<sup>7-9</sup>. These findings come parallel to the fact that higher rates of HTN exists in male population. Moreover another study<sup>8</sup> concluded that HTN more in males than females. However, one of the interesting findings of their survey was that patients, particularly females tend to be more hypertensive with age. However, a number of studies conducted<sup>10,16,17</sup> found that most of the study participants were females. This is due to the fact that more females were recruited in the study than males. In terms of weight, our study found that out of the 385 patients included in the study, (47.5%) were overweight and (46.5%) were having normal weight. These findings were somewhat similar to the findings of another study where most of the study participants were overweight (45.2%) and (33.1%) were having normal weight<sup>18</sup>. This can be explained by the fact that increasing physical activity might reduce BP through decreased body weight or favourable changes in body fat distribution. However, another study conducted<sup>14</sup> showed that most of the study participants were having normal weight (50.2%) and only (38.3%) were overweight and this may be due to the small sample size (n=51) in the hypertension control group of their study. It was reassuring that a positive sign was revealed by this study as a large proportion of the study participants showed high knowledge

and adherence attitude towards HTN. Although a positive relationship was discovered between knowledge and attitude, still adherence is considered a multi-factorial phenomenon and success or failure of patient's adherence to therapy is not dependant on single key factor such as knowledge. Other factors such as age, gender, income, patient-provider relationship, medication cost and presence of psychological problems (especially stress and depression) should also be considered and evaluated before coming to conclusion<sup>7</sup>. The positive drug adherence attitude towards medication adherence of this study indicated that there is adequate and strong relationship between patient and healthcare provider which in turn revealed that the health care provider's vision and goal were all centred on the patient's needs. A study previous showed that when community pharmacists participated as members of health care team, patient satisfaction, BP control and quality of life were achieved<sup>5</sup>. Also the high knowledge score of this study revealed that nowadays patients are well educated toward their HTN and are eager and keen to learn more about it as it is one of the most common diseases in the UAE following DM. This also indicates that the UAE health care system is always concerned with awareness and education of public towards causes, management and control of HTN through different type of communication tools such as (educational campaign, lectures, field visits and much more). In addition, this study proved that the majority of the study participants know that fatty foods, age and obesity may increase the risk to develop HTN. However, a negative sign shown by this study is that over 30% of the study participants believed that salt and smoking have no effect in increasing the risk of developing HTN. Another negative sign of the study is that around 60% of the participants considered that HTN is a curable and treatable condition neglecting the fact that

it is a chronic condition that cannot be completely treated. Also, 50% of them think that medications alone can control and manage HTN.

## CONCLUSION

The results of this study clearly showed that there was positive correlation between knowledge and drug adherence attitude among hypertensive patients in UAE. Despite this finding, it is believed that medication adherence is a multi-factorial phenomenon and knowledge is only one key factor of these factors.

## REFERENCES

1. Sunita Pawar, Kaveri D. Lokhande, Soumya Padma, Arundhati Diwan (2014). Effect of pharmacist mediated patient counselling in hypertensive patients interms of knowledge, compliance and lifestyle modification. *International Journal of Pharmacy and Pharmaceutical Sciences*, Vol 6, Issue 4.
2. Kayiranga Dieudonné (2010). Assessment of knowledge, attitude and practice of Kigarama community in prevention of risk factors leading to Hypertension.
3. Biradar S. S., Kapate jRajashekhhar, Reddy Srinivas, Raju S. A. (2012). Role of pharmacist towards knowledge, attitude and practice in compliance with Hypertension in north Karanataka in south Indian city: A brief overview. *International research journal of pharmacy*, 3(5).
4. Mlunde Linda (2006/2007). Knowledge, Attitude and Practices towards Risk Factors for Hypertension in Kinondoni Municipality, Dar es Salaam. *DMSJ Vol. 14 No. 2*.
5. Rahmathulla V., A. Srinivasan, S. Kannan, A. Shareef (2014). Impact of Hospital Pharmacist Education on Adherence, Knowledge, Attitude and Practice of Hypertensive Patients in a Private Multi-Specialty Hospital. *International Journal of Pharma Research & Review*, 3(10):14-25.
6. Ali Arazeem Abdullahi and Jimoh Amzat (2011). Knowledge of hypertension among the staff of University of Ibadan, Nigeria. *Journal of Public Health and Epidemiology* Vol. 3(5), pp. 204-209.
7. F. Saleem, M.A. Hassali, A.A. Shafie, A.G. Awad and S. Bashir (2011). Association between Knowledge and Drug Adherence in Patients with Hypertension in Quetta, Pakistan. *Tropical Journal of Pharmaceutical Research*, 10 (2): 125-132.
8. Godfrey B.S. Iyalomhe and Sarah I. Iyalomhe (2010). Hypertension-related knowledge, attitudes and life-style practices among hypertensive patients in a sub-urban Nigerian community. *Journal of Public Health and Epidemiology* Vol. 2(4), pp. 71-77.
9. Mumtaz Ali Shaikh, Dur-e-Yakta, Sadia, Raj Kumar (2012). Hypertension Knowledge, Attitude and Practice in Adult Hypertensive Patients at LUMHS. *JLUMHS*, Vol 11: No. 02.
10. Sultan Baliz Erkoc, Burhanettin Isikli, Selma Metintas and Cemalettin Kalyoncu (2012). Hypertension Knowledge-Level Scale (HK-LS): A Study on Development, Validity and Reliability. *Int. J. Environ. Res. Public Health* 2012, 9, 1018-1029.
11. HAAD health statistics 2013, Public health highlights (2014), online, Available at: [http://www.haad.ae/HAAD/LinkClick.aspx?fileticket=LrAOka\\_Zx3Q%3d&tabid=349](http://www.haad.ae/HAAD/LinkClick.aspx?fileticket=LrAOka_Zx3Q%3d&tabid=349)
12. MOH Statistics for 2013, Percentage of diseases diagnosed at P.H.C. by type of disease (2013), online, Available at: <http://www.moh.gov.ae/en/OpenData/Pages/OpenData.aspx?Category=Statistics>

13. Umar Gati Adamu, Idogonsit OkonIbok, Aisha Abdullahi, Isaac Olajide Ogundele, George Alaba Okuku (2014). Knowledge, Attitude and Practice of Physicians in the Treatment of Hypertension in North-Central Nigeria. *World Journal of Cardiovascular Diseases*, 2014, 4, 251-256.
14. Amonov Malik, Yoshitoku Yoshida, ToirovErkin, Davlatov Salimand Nobuyuki Hamajima (2014). Hypertension-related knowledge, practice and drug adherence among inpatients of a hospital in Samarkand, Uzbekistan. *Nagoya J. Med. Sci.* 76. 255 ~ 263.
15. Majd Dameh (2009). Pharmacy in the United Arab Emirates. PMC, PMID:3471164.
16. Khaleej times, Arab Health Congress to address hypertension cases in UAE (2014), online, Available at: [http://www.khaleejtimes.com/nation/inside.asp?xfile=/data/nationhealth/2014/October/nationhealth\\_October58.xml&section=nationhealth](http://www.khaleejtimes.com/nation/inside.asp?xfile=/data/nationhealth/2014/October/nationhealth_October58.xml&section=nationhealth)
17. Olusegun Adesola Busari, Timothy Olusegun, Olanrewaju, Olufemi, Olumuyiwa Desalu, Oladimeji George Opadijo, Ahmed Kayode Jimoh, Segun Matthew Agboola, Olusogo Ebenezer Busari, Olaleye Olalekan (2010). Impact of Patients' Knowledge, Attitude and Practices on Hypertension on Compliance with Antihypertensive Drugs in a Resource-poor Setting. *TAF Preventive Medicine Bulletin* 2010; 9(2):87-92.
18. Masoud M. Malekzadeh, Arash Etemadi., Farin Kamangar, Hooman Khademi, Asieh Golozar, Farhad Islami, Akram Pourshams, Hossein Poustchi, Behrouz Navabakhsh, Mohammad Naemi, Paul D. Pharoah, Christian C. Abnet, Paul Brennan, Paolo Boffetta, Sanford M. Dawsey, Alireza Esteghamati, and Reza Malekzadeh (2013). Prevalence, awareness and risk factors of hypertension in a large cohort of Iranian adult population. *Journal of Hypertension*.
19. Suliman A. Al Ghurair, Christine A. Hughes, Scot H. Simpson, Lisa M. Guirguis (2012). A Systematic Review of Patient Self-Reported Barriers of Adherence to Antihypertensive Medications Using the World Health Organization Multidimensional Adherence Model. *The Journal of Clinical Hypertension* Vol. 14, No 12.
20. Awotidebe, T.O., Adedoyin, R.A., Rasaq, W.A., Adeyeye, V.O., Mbada, C.E., Akinola, O.T., Ot wombe, K.N (2014). Knowledge, attitude and Practice of Exercise for blood pressure control: A cross-sectional survey. *Journal of Exercise Science and Physiotherapy*, Vol. 10, No. 1: 1-10.
21. Pragnesh Parmar, Gunvanti B. Rathod, Sangita Rathod, Rahul Goyal, Sachin Aggarwal and Ashish Parikh (2014). Study of knowledge, attitude and practice of general population of Gandhinagar towards hypertension. *International journal of current microbiology and applied sciences*, volume 3 Number 8 pp. 680-685.
22. Roca Bernardino, Nadal Elena, Rovira Rosa E, Valls Sonia, Lapuebla Consol, Lloria Néstor. Usefulness of a hypertension education program. *South Med J.* 2003 Nov;96(11):1133-7.
23. Viera Anthony J, Cohen Lauren W, Mitchell C Madeline, Sloane Philip D. High blood pressure knowledge among primary care patients with known hypertension: a North Carolina Family Medicine Research Network (NC-FM-RN) study. *J Am Board Fam Med.* 2008 Jul;21(4):300-8. doi: 10.3122/jabfm.2008.04.070254.

**Table 2.** Characteristics of the study participants (N=385)

Characteristics	Sub group	Frequency	Percentage
Age	25-34	77	20.1
	35-44	88	23.0
	45-54	123	32.0
	55 -64	74	19.4
	65 and more	23	6.4
Gender	Male	209	54.3
	Female	176	45.7
Nationality	UAE nationals	51	13.2
	Arabs	303	78.7
	Others	31	8.1
Marital status	Single	77	20.0
	Married	280	72.7
	Divorced	9	2.3
	Widow	19	4.9
Education level	Below high school	59	15.3
	High school or diploma	145	37.7
	Bachelor	162	42.1
	Master	12	3.1
	PhD	7	1.8
Salary(AED)	Below 10,000	224	58.2
	More than 10,000	161	41.8
Attended workshops on HTN	Yes	66	17.1
	No	319	82.9
Smoking/not-smoking	Ex-smoker	36	9.4
	Yes	99	25.7
	No	250	64.9
Weight	Over weight	183	47.5
	Under weight	23	6.0
	About right	179	46.5
Family history of HTN	Yes	261	67.8
	No	124	32.2



**Table 3.** Correct responses to HFQ in descending order

HTN Knowledge Item	Correct answer	
	N	%
1. Eating fatty food affects blood cholesterol level which is a risk factor for developing hypertension	351	91.2
2. Being overweight increases the risk of hypertension	351	91.2
3. Regular physical activity will lower a person's chance of getting hypertension	345	89.6
4. Hypertension is a condition which can progress with age	330	85.7
5. The older the person is, the greater his risk of developing hypertension	330	85.7
6. Elevated BP is called hypertension	329	85.5
7. Hypertension can lead to other life-threatening diseases?	328	85.2
8. Smoking is a risk factor for hypertension	323	83.9
9. Eating more salt has no effect on blood pressure	294	76.4
10. Do you know the normal values of blood pressure?	288	74.8
11. Hypertension is a treatable condition	261	67.8
12. Dietary approaches to reduce hypertension are not good	245	63.6
13. Medication alone can control hypertension?	202	52.5
14. White meat is as good as red meat in hypertension?	154	40.0
15. Both men and women have equal chances of developing hypertension	142	36.9

**Table 4.** Correct responses to DAI-10 in descending order

HTN Knowledge Item	Correct answer	
	N	%
1. I take medications of my own choice.	322	83.6
2. By staying on medications, I can prevent getting sick.	304	79.0
3. For me, the good things about medication outweigh the bad	299	77.7
4. Medications make me feel more relaxed.	295	76.6
5. Medications make me feel tired and sluggish.	294	76.4
6. I feel uncomfortable on medication.	260	67.5
7. My thoughts are clearer on medication.	242	62.9
8. I feel more normal on medication.	218	56.6
9. It is unnatural for my mind and body to be controlled by medications.	183	47.5
10. I take medication only when I am sick.	143	37.1

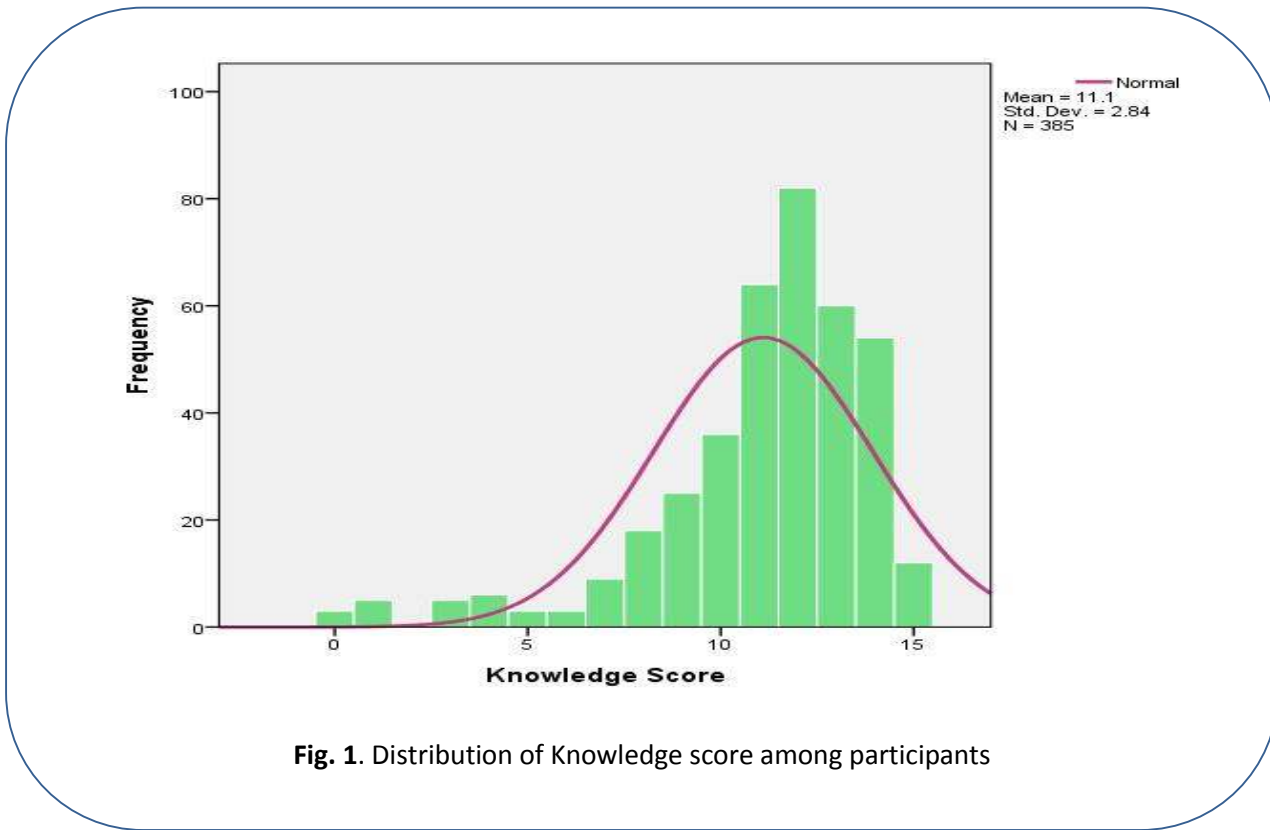


Fig. 1. Distribution of Knowledge score among participants

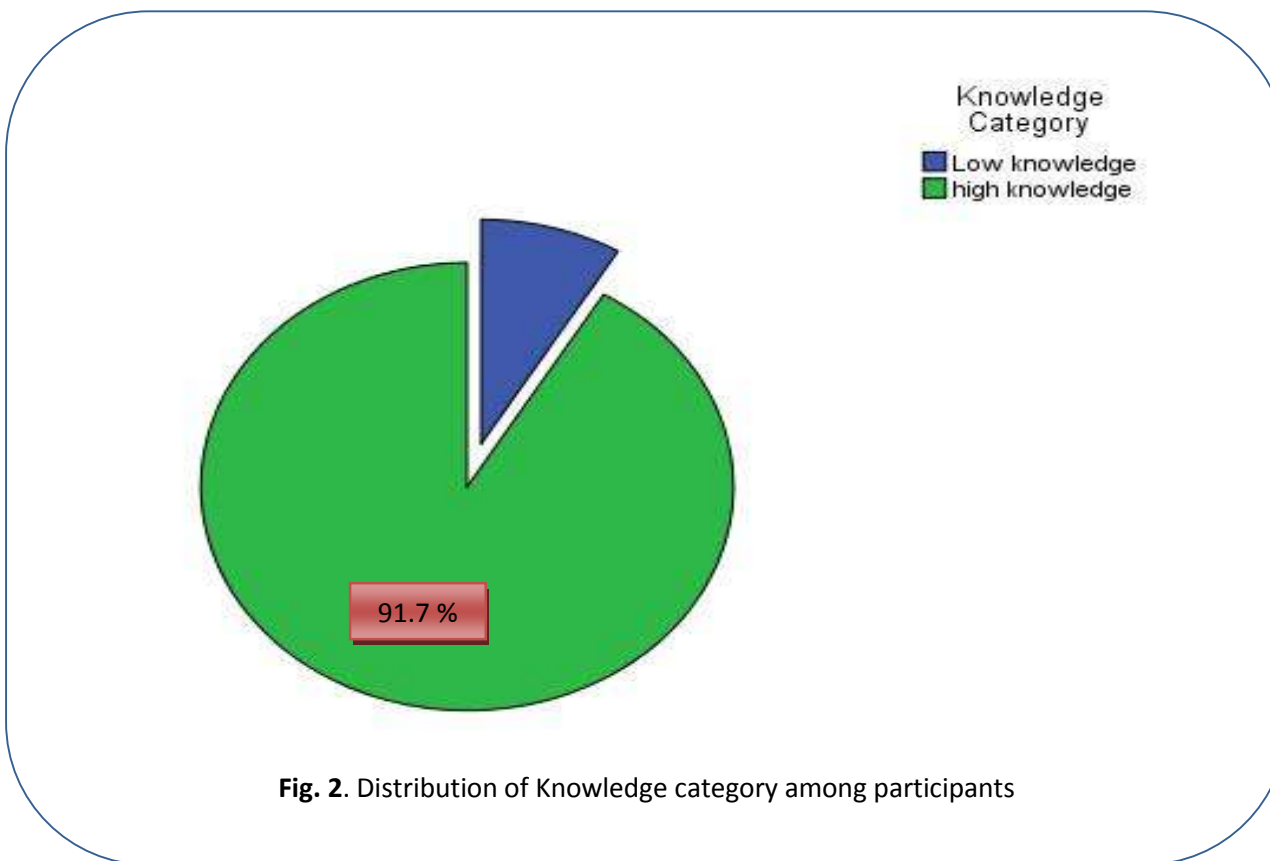


Fig. 2. Distribution of Knowledge category among participants

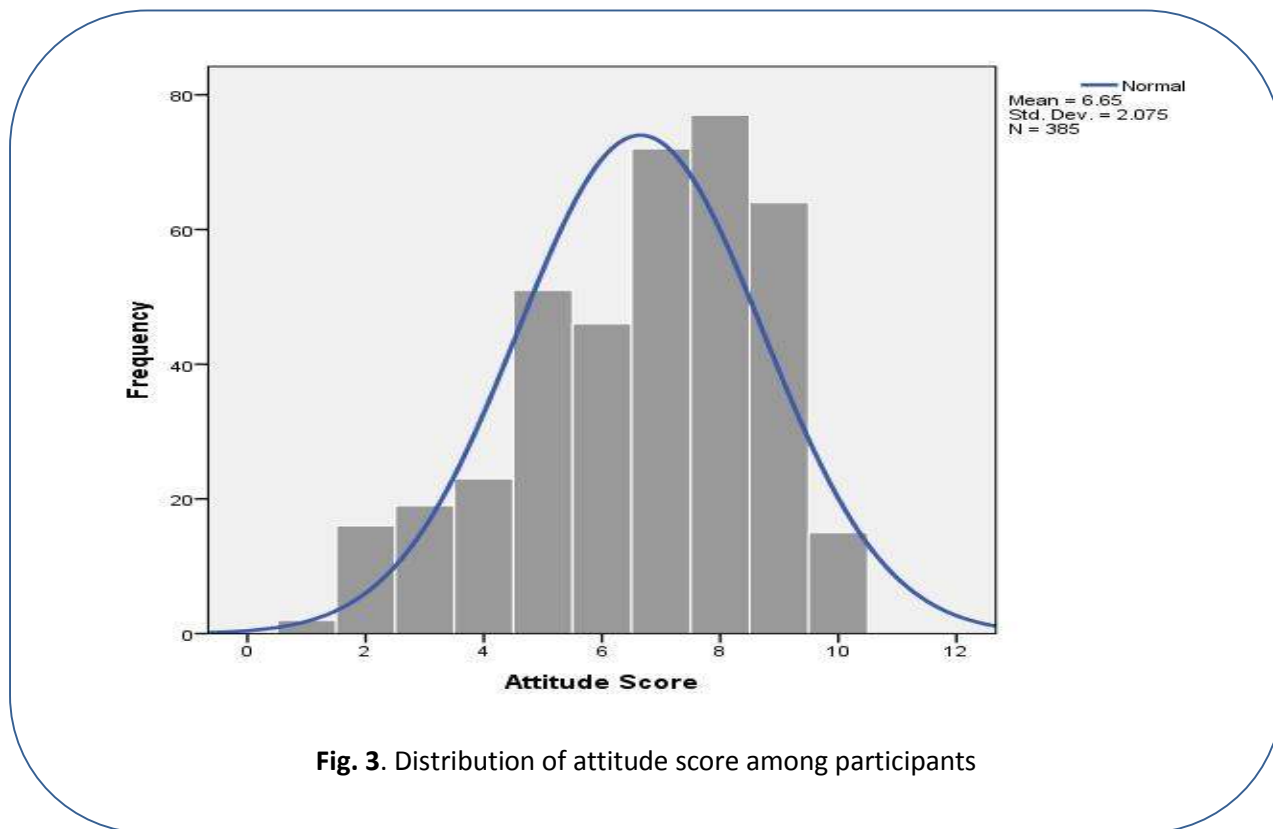


Fig. 3. Distribution of attitude score among participants

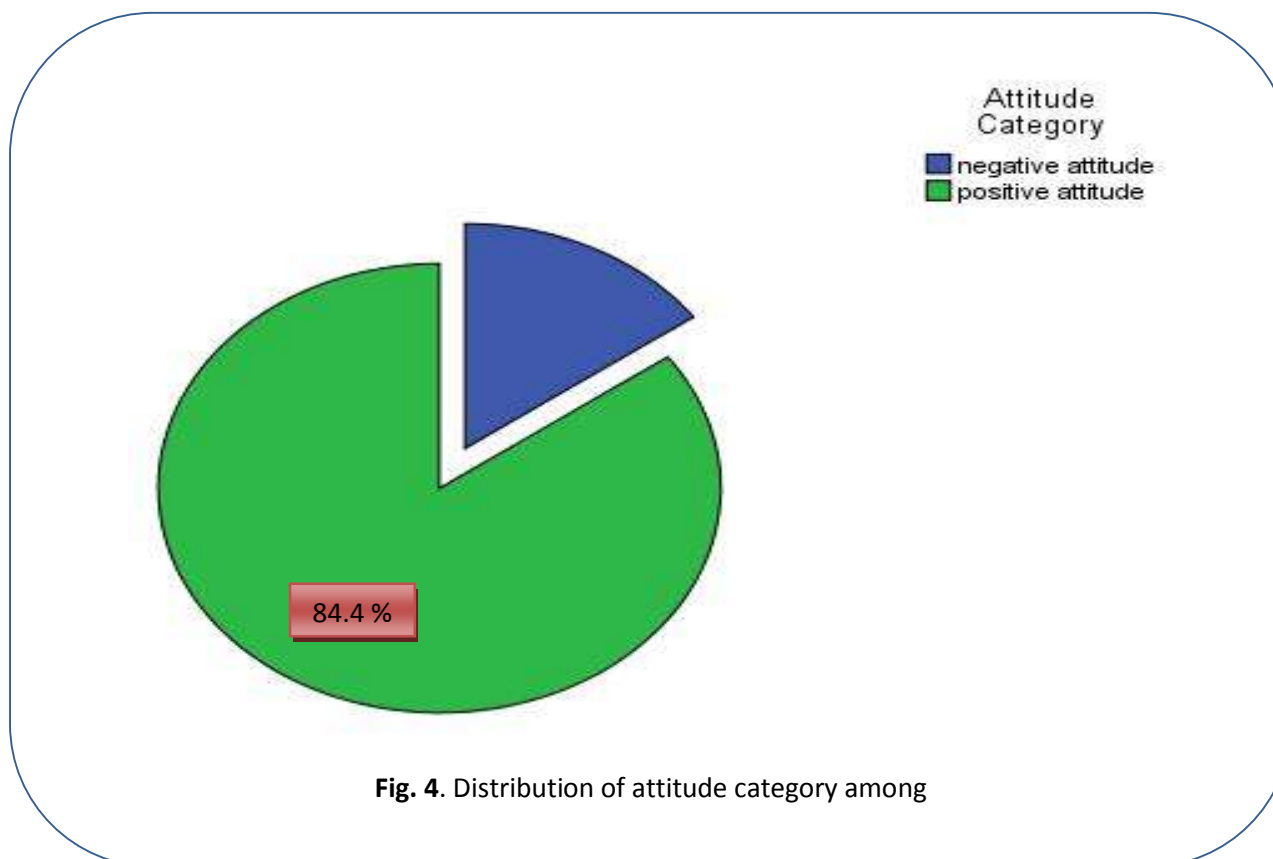


Fig. 4. Distribution of attitude category among