



health-care providers inside the study departments; a proportional weighted sample taken as follows 120 physician from educational hospital and 60 from non-educational hospitals. Surgical and medical departments included Internal medicine, general surgery, Obstetrics and Gynecology, Ophthalmology and Otorhinolaryngology chosen in relation to the frequency of operations for proper assessment. The study included both males and females. Inclusion criteria were physicians working in the chosen departments for at least six months assimilated with the hospital processes and system with no managerial role. Assistant lecturers or physician who took master degree, residents and residents visitors that are considered as junior physicians and the rest falling in the category of consultant physicians in the selected hospitals. These hospitals served patients came from both urban and rural areas in Sharkia government and admitted for invasive procedure. The study period was from July 2015-August 2016.

#### **Data collection and Study tools**

A pre-designed questionnaire included items about the occupational background of participants (department, job title, lifetime duration of work experience and history of medical training). The questions related to KAP included 48 items. The authors developed these items after reviewing similar published articles.<sup>10</sup> For knowledge, 27 items were included, e.g. ethics oath and ethics committee (3 items), ethics committee role (5 items), principles of healthcare ethics (4 items), main purposes of consent (9 items), familiarity with the informed consent process, with holding truth and respecting confidentiality (5 items).

Attitudes were assessed using 5 questions, e.g. are you interested in knowing more about healthcare ethics, I usually keep patients privacy, close relatives must know about a patient's condition, confidential information can only be disclosed if the patient gives explicit consent or if expressly provided for in the law, confidentiality cannot be applied in modern care and should be abandoned.

An observation checklist assessed how far the physicians adhered to specified principles of medical ethics: informed consent, privacy, confidentiality and collaboration of patients in the process of decision-making for treatment. Practices evaluated using 16 items; informing patient's rights, informing possible consequences of treatment, informing medical condition and treatment procedures, answer patient's questions. Provide information on risks and possible complications of treatment, informing length of hospital stay, ensured privacy during examination, follow guidelines in practice, complied with the rules of confidentiality, gaining more knowledge for healthcare ethics and law making seven items.

The questionnaire developed in Arabic using simple local language and tested in a pilot study with 20 persons of different job titles. The reliability of the questionnaire assessed by applying reliability test using Cronbach alpha (0.73).

#### **Scoring**

The KAP scores were calculated as follows: satisfactory knowledge was score 2 for yes and 1 for no making a total of 54 points; satisfactory attitude was scored into five levels (score 1: strongly disagree 2: disagree 3: uncertain 4: agree 5: strongly agree) considering reversed answers. A total score calculated whereas, correct agreement recorded five points and the incorrect zero, counting a total of 25 points ; satisfactory practice scored 2 points for yes and 1 for no totaled 32 points. The total knowledge, perception and compliance score calculated as a percentage of the maximum possible score.

#### **Data processing and analysis**

Collected data recorded and analyzed using SPSS (Statistical Package for the Social Sciences) version 22.0 and Epi info for windows version 3.5.3. A summary of data done where frequencies, percentages and Chi square used for qualitative data while for quantitative data, mean and standard deviations (SD), t-test and ANOVA were calculated.  $P < 0.05$  was considered statistically significant. The significance of the results judged at the 5% level of significance.

#### **Ethical consideration**

Approval from selected departments research review board and central hospital administration obtained to conduct the study. An oral consent gotten from participants after explaining the study objectives and assuring data confidentiality. To preserve confidentiality the questionnaire was anonymous and data kept confidential in a file that accessed only by the authors.

### **3. Results**

The study included 792 physicians having different grades and specialists. More than half are males, residents, in the age category from 21-30 years. Although physicians working in Non-educational hospitals 53.3% are having more years of experience from 6-10 years compared to 30% of those working in the Educational hospitals yet 50% received medical training compared to 18.3% only of the physicians working in the Non-educational hospitals ( $P < 0.001$ ) (Table 1). The majority acknowledged the presence of an ethics committee in the faculty. Only a few of them stated that they approached the committee for advice.

#### **Knowledge items**

In concern to the Ethics oath and ethics committee, more than half of the physicians working in educational and Non-educational hospitals knew about the Hippocratic declaration. Only a significant low percent of those working in Educational hospitals stating that they knew about the Helsinki declaration (10.8%) ( $P < 0.05$ ). Physicians have more knowledge about most of the items related to the Ethics committee role. Concerning their knowledge about some items in the informed consent a significant percent of the Non-educational category are more knowledgeable ( $P < 0.001$ ). Whereas, a significant percent of the other category are more familiar with the informed consent process (62.2%) ( $P < 0.001$ ) and with most of the items in concern to

withholding truth and respecting confidentiality ( $P < 0.05$ ) (Table 2).

#### Attitude items

As regard, Physicians' perceptions towards healthcare ethics and consultation of ethical problems. A significant percentage of physicians working in Educational hospitals are interested in knowing more about healthcare ethics (37.5%). Mostly agreed that confidential information can only be disclosed if the patient gives explicit consent or if expressly provided for in the law (89.1%), and confidentiality cannot be applied in modern care and should be abandoned (46.2%) ( $P < 0.001$ ). Whereas, a higher significant percent of physicians working in Non-educational hospitals agreed that they must usually keep patients privacy. However, fewer physicians agreed to tell close relatives about a patient's condition (Table 3).

#### Practice items

Physicians' observed compliance to ethical practices during physician-patient interactions and their source of knowledge about health care Ethics and law are shown in table 4. In practice, patients sign the treatment consent at the hospital reception, possibly signed by relatives, obtained by junior doctor but unfortunately, most of the physicians knew that patients not allowed receiving a copy of signed consent (Table 4).

#### Total scores

By comparing the total satisfactory knowledge and practice scores, it was found that the percentage of physicians working in educational hospitals have significantly higher scores than those working in the Non-educational hospitals and was significant better in ophthalmology & ENT departments than others ( $P < 0.001$ ) (Table 5 & 6).

#### Multiple regression

Hierarchical multiple regression was used to assess the ability of two control measures (total knowledge score and total attitude score) to predict levels of total practice score, after controlling for the influence of age, gender, specialty and grouping variable as educational or non-educational hospital. In the final model, only two measures were statistically significant, total knowledge score and total attitude score,  $R$  square = 0.21, meaning that they explained 21.0% of variance in total practice score with the total attitude score recording a higher beta value ( $\beta = 0.37$ ,  $p < .001$ ) than the total knowledge score ( $\beta = 0.17$ ,  $p = 0.025$ ) (Table 7).

## 4. Discussion

In order to formulate an effective ethics curriculum for health care workers, the first step is to elucidate their current basic knowledge, perceptions and practices related to healthcare ethics and consultation of ethical problems. To identify the gaps between the current KAP among the health-care workers involved in healthcare ethics and the future desired state.

Ethics committees are the most prominent formal institutional mechanism for considering and resolving ethical dilemmas in medicine. In clinical practice,

Healthcare ethics needs more attention especially in LMICs such as Egypt. The present study and Mohamed et al., 2012<sup>11</sup> indicated that the majority of physicians acknowledged the presence of an ethics committee in their faculty. Despite this, only a few of them stated that they approached the committee for advice.

The fact that the majority of the participants had no knowledge regarding the Nuremberg Code and or the Helsinki Declaration indicates that there is very little knowledge regarding the ethics of research. Similarly Hariharan et al., 2006<sup>10</sup> detected the same findings in their research. The development of universal ethical and legal standards, including the Nuremberg Code, the Declaration Helsinki, and the Universal Declaration on Bioethics and Human Rights of UNESCO, seeks to limit and control the improper use of science and associated technologies and to promote and protect fundamental human rights.<sup>12</sup>

The findings of the present study clearly show the difference in the knowledge and practices between physicians working in Educational and Non-educational hospitals regarding the medical ethics and law. Obviously, they contact patients more frequently having an opportunity to gain hands on learning experience without adequate knowledge. Several previous studies have assessed the knowledge, attitudes, and practices of faculty staff members at their institutions in Egypt and Saudi Arabia. The results demonstrated that most of the educational programs in research ethics lacked training in practice (Kandeel et al., 2008)<sup>13</sup> and (Silverman et al., 2013).<sup>14</sup>

It is interesting to note that if physicians feel that their main source of knowledge of health care ethics is during experience at work, job experience should tailored to reinforce ethical knowledge and practice. Similarly Abdelhai et al., 2014<sup>15</sup> revealed improvement in knowledge and skills of trainee's postgraduate students as an effects of training course over a period of 3 weeks with pre/post assessment. That is why Integration of such course within the public health postgraduate curriculum is required as it provides prospects of capacity building among academic and research staff. In developing countries, training in medical research ethics is available on a limited scope.<sup>16</sup>

From another viewpoint, the attitude of doctors in general blamed as well. A materialistic mindset, low ethical and moral standards and communication gap between doctors and patients are also responsible for problems in the health care system.<sup>15</sup> In the present study, differences in opinions & misperceptions observed which probably reflects different levels of training and experience among respondents.

The present study revealed that physicians were more compliant with the role of the ethics committee. In contrast, Tahira et al., 2013<sup>17</sup> in their study reported that most of the physicians had poor knowledge regarding autonomy. However, McGuire et al 2005<sup>18</sup> have reported that physicians had a consistently positive attitude towards patient's autonomy in their study.

Concerning physicians' knowledge about the main purpose and process of the informed consent. In agreement another

study done to assess Knowledge, practice and perception towards the informed consent process among physicians and patients at Cairo University Hospitals.<sup>19</sup>

Confidentiality is among the core issues of doctor patient relationship. The present study and **Hariharan et al, 2007**<sup>10</sup> reported that most of the respondents agreed that confidentiality and patient privacy to be important and few were in favor of informing relatives about patient's condition.<sup>17</sup>

This result suggests that medical ethics education in this study strengthened in topics where knowledge levels were low. Medical education should also address changing attitudes and perceptions of residents. Previous research suggested that positive attitudes of residents toward ethics preparation improved beneficial outcomes of educational innovations.<sup>20</sup> Such findings support the belief that assessing trainees' attitudes, views and preferences is important in developing curricular approaches attuned to their concerns and experiences.<sup>21</sup>

The implementation of the informed consent process differs markedly in-between countries and among different medical specialties. Although, it is as a standard procedure in developed countries for providing the patients with information about diagnostic and treatment procedures, benefits, risks and alternatives of treatment, it often fails to meet its goal in many developing countries.<sup>22</sup>

In the current study, more physicians correctly knew that patients not allowed receiving a copy of the signed consent form. In contrast, **Jukic et al. 2011**<sup>23</sup> found that a significantly higher percent of physicians ( $P < 0.001$ ) incorrectly knew that patients receive a copy of the signed informed consent. **Ashraf et al., 2014**<sup>24</sup> stated that the signed consent form should be obtained by the patient's physician after discussing all the required information. In this study, a significantly higher percent of physicians ( $P < 0.001$ ) thought that they should be responsible for obtaining the signed informed consent from their patients. However, in another study conducted in South Croatia to evaluate the differences in knowledge and attitudes of physicians and patients regarding the informed consent process, the majority of the of physicians were prone to delegate such process to other members of medical staff like their colleagues, nurses or administrative personnel.<sup>23</sup> The importance of physicians to take a consent by themselves, is that it opens a dialogue between the patient and provider so that the patient can ask questions, knows what to expect during and after procedure.<sup>25</sup>

In Egypt, the validity of the informed consent process in medical practice challenged by many factors like educational level and socioeconomic status of patients together with other legal and cultural factors.<sup>19</sup>

In the regression coefficients for the total practice score regarding with different predictors, the change in both attitude score and knowledge score recording change in practice score but attitude score recorded high beta change than knowledge and this explained the importance of providing more efforts to improve the attitude of healthcare

providers like the efforts done in improving knowledge of healthcare ethics this is agreed with **Peter et al., (2015)**<sup>26</sup> stated that assessment of junior doctors' attitudes toward medical professionalism as the first step in developing and modernizing the curriculum in medical professionalism and ethics is effective as knowledge, while in **Jukic et al., (2009)**<sup>23</sup> showed no difference in knowledge and practice score between physicians working in university hospitals and those working in community hospital ( $P > 0.05$ ).

## 5. Conclusion and Recommendations

Improving the resident's awareness and knowledge about basic principles of medical ethics corresponding with improving resident's attitude towards ethics through their medical education helping to improve their practice in their work. In order to bring services into line with the expectations of patients, the tolerance level of physicians for dealing with illiterate and poor patients should be improved, through learning expression management skills.

Our findings also revealed a gap between current knowledge of healthcare ethics among health-care workers and that demanded by hospital management policies. We recommend there should be proper and intensive training programmes regarding awareness and practices of healthcare ethics for all health-care staff, with continuous monitoring at regular intervals. Moreover, research must seal existing gaps in the knowledge about healthcare ethics. The findings of this study will help to address the issue more appropriately, and inform plans for better training programmes and monitoring of the bioethics management systems in hospitals.

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## 7. Conflict of Interests Declaration

No

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**Table 1:** Socio-demographic characteristics of physicians in educational and non-educational hospital

| Socio-demographic characteristics | Educational |              | Non- educational |              | P-value |
|-----------------------------------|-------------|--------------|------------------|--------------|---------|
|                                   | No.         | %            | No.              | %            |         |
| <b>Age categories</b>             |             |              |                  |              |         |
| 21-30                             | 92          | 76.7         | 33               | 55.0         | 0.003*  |
| 31-40                             | 28          | 23.3         | 27               | 45.0         |         |
| <b>Gender</b>                     |             |              |                  |              |         |
| Male                              | 77          | 64.2         | 38               | 63.3         | 0.91    |
| Female                            | 43          | 35.8         | 22               | 36.7         |         |
| <b>Duration of workexperience</b> |             |              |                  |              |         |
| <5                                | 80          | 66.7         | 28               | 46.7         | 0.005*  |
| 6-10                              | 36          | 30.0         | 32               | 53.3         |         |
| 11-15                             | 4           | 3.3          | 0                | 0.0          |         |
| <b>Job title</b>                  |             |              |                  |              |         |
| Resident                          | 79          | 65.8         | 38               | 63.3         | 0.74    |
| Master degree                     | 41          | 34.2         | 22               | 36.7         |         |
| <b>Medical training</b>           |             |              |                  |              |         |
| Yes                               | 60          | 50.0         | 11               | 18.3         | 0.001*  |
| No                                | 60          | 50.0         | 49               | 81.7         |         |
| <b>Total</b>                      | <b>120</b>  | <b>100.0</b> | <b>60</b>        | <b>100.0</b> |         |

\*Significant P value

**Table 2:** Physicians' knowledge about medical ethics and informed consent

| Knowledge statement<br>(Items correctly answered)                             | Educational |            | Non-educational |            | P- value |
|---|-------------|------------|-----------------|------------|----------|
|   | No.         | %          | No.             | %          |          |
| <b>Ethics oath and ethics committee</b>                                       |             |            |                 |            |          |
| Hippocratic   | 75          | 62.5       | 35              | 58.3       | 0.75     |
| Nuremberg code  | 4           | 3.3        | 0               | 0.0        | 0.30     |
| Helsinki declaration  | 13          | 10.8       | 0               | 0.0        | 0.005*   |
| <b>Ethics committee role</b>  |             |            |                 |            |          |
| To ensure standard ethical practices  | 114         | 95.0       | 60              | 100        | 0.22     |
| To advise healthcare personnel when they encounter ethical/legal problem      | 105         | 87.5       | 57              | 95.0       | 0.23     |
| To approve and guide research   | 190         | 75.0       | 20              | 33.3       | 0.001*   |
| To settle conflicts between professional and patient relatives                | 92          | 76.7       | 60              | 100.0      | 0.001*   |
| To teach medical ethics to students   | 108         | 90.0       | 22              | 36.7       | 0.001*   |
| <b>Principles of healthcare ethics</b>  |             |            |                 |            |          |
| Justice   | 93          | 77.5       | 15              | 25         | 0.001*   |
| Autonomy  | 59          | 49.2       | 5               | 8.3        | 0.002*   |
| Tenderness  | 32          | 26.7       | 15              | 25.0       | 0.004*   |
| Beneficence   | 59          | 49.2       | 15              | 25.0       | 0.002*   |
| <b>Main purposes of consent</b>   |             |            |                 |            |          |
| Explain the benefits and probabilities of success for treatment               | 56          | 46.7       | 54              | 90.0       | 0.001*   |
| Telling the patient the known possible side effects and risk of the treatment | 103         | 85.8       | 48              | 80.0       | 0.32     |
| Giving them information about the treatment only                              | 22          | 18.3       | 14              | 23.3       | 0.43     |
| Inform the patient about alternative treatment option                         | 62          | 51.7       | 13              | 21.7       | 0.001*   |
| Provide the doctor with greater protection against medical litigation         | 60          | 50.0       | 54              | 90.0       | 0.001*   |
| Be able to understand the significance, risks and benefits of the procedures  | 86          | 72.3       | 5               | 8.3        | 0.003*   |
| Make decision that the physician would choose                                 | 35          | 29.4       | 26              | 43.3       | 0.064    |
| Age>18  | 82          | 68.9       | 16              | 26.7       | 0.001*   |
| Stable ,mental state and conscious level                                      | 83          | 69.7       | 58              | 96.7       | 0.001*   |
| Are you familiar with the informed consent process?                           | 74          | 62.2       | 7               | 11.7       | 0.001*   |
| <b>Withholding truth and respecting confidentiality</b>                       |             |            |                 |            |          |
| Suicidal treatment  | 80          | 67.2       | 53              | 88.3       | 0.002*   |
| Refusing treatment  | 36          | 30.3       | 5               | 8.3        | 0.001*   |
| Unstable personality with fatal disease                                       | 87          | 73.1       | 32              | 53.3       | 0.008*   |
| Is personal information in patient medical record                             | 76          | 63.9       | 12              | 20.0       | 0.001*   |
| Considered confidential   | 64          | 53.7       | 11              | 18.3       | 0.001*   |
| <b>Total</b>  | <b>120</b>  | <b>100</b> | <b>60</b>       | <b>100</b> |          |

\*Significant P value

**Table 3:** Physicians' perceptions towards healthcare ethics and consultation of ethical problems

| Perception Domain   | Educational |            | Non-educational |            | P-value |
|---|-------------|------------|-----------------|------------|---------|
|   | No.         | %          | No.             | %          |         |
| <b>Are you interested in knowing more about healthcare ethics</b>   |             |            |                 |            |         |
| Strongly agree/agree  | 45          | 37.5       | 7               | 11.7       | 0.001*  |
| Not sure  | 61          | 50.9       | 53              | 88.3       |         |
| Disagree/strongly disagree  | 14          | 11.6       | 0               | 0.0        |         |
| <b>Total</b>  | <b>120</b>  | <b>100</b> | <b>60</b>       | <b>100</b> |         |
| <b>I usually keep patients privacy</b>  |             |            |                 |            |         |
| Strongly agree/agree  | 94          | 79.0       | 54              | 90         | 0.001*  |
| Not sure  | 0           | 0          | 0               | 0.0        |         |
| Disagree/strongly disagree  | 25          | 21         | 6               | 10.0       |         |
| <b>Total</b>  | <b>119</b>  | <b>100</b> | <b>60</b>       | <b>100</b> |         |
| <b>Close relatives must know about patient's condition</b>  |             |            |                 |            |         |
| Strongly agree/agree  | 18          | 15.1       | 2               | 3.3        | 0.052*  |
| Not sure  | 33          | 27.7       | 14              | 23.3       |         |
| Disagree/strongly disagree  | 68          | 57.2       | 44              | 73.4       |         |
| <b>Total</b>  | <b>119</b>  | <b>100</b> | <b>60</b>       | <b>100</b> |         |
| <b>Confidential information can only be disclosed if the patient gives explicit consent or if expressly provided for in the law</b> |             |            |                 |            |         |
| Disagree/strongly disagree  | 106         | 89.1       | 16              | 26.7       | 0.001*  |
| Not sure  | 9           | 7.6        | 1               | 1.6        |         |
| Strongly agree/agree  | 4           | 3.3        | 43              | 71.7       |         |
| <b>Total</b>  | <b>119</b>  | <b>100</b> | <b>60</b>       | <b>100</b> |         |
| <b>Confidentiality cannot be applied in modern care and should be abandoned</b>   |             |            |                 |            |         |
| Strongly agree/agree  | 55          | 46.2       | 7               | 11.7       | 0.001*  |
| Not sure  | 22          | 18.5       | 53              | 88.3       |         |
| Disagree/strongly disagree  | 42          | 35.3       | 0               | 0.0        |         |

|              |            |            |           |            |  |
|--------------|------------|------------|-----------|------------|--|
| <b>Total</b> | <b>119</b> | <b>100</b> | <b>60</b> | <b>100</b> |  |
|--------------|------------|------------|-----------|------------|--|

\*Significant P value

**Table 4:** Physicians' observed compliance to ethical practices during physician–patient interactions

| Compliance practice<br>(Items correctly performed)                          | Educational |              | Non-educational |              | P-value |
|---|-------------|--------------|-----------------|--------------|---------|
|   | No.         | %            | No.             | %            |         |
| <b>Informing patient's rights</b>   |             |              |                 |              |         |
| Yes   | 38          | 31.9         | 11              | 18.3         | 0.011*  |
| <b>Informing possible consequences of treatment</b>                         |             |              |                 |              |         |
| Yes   | 100         | 84           | 47              | 78.4         | 0.21    |
| <b>Informing medical condition and treatment procedures</b>                 |             |              |                 |              |         |
| Yes   | 40          | 33.6         | 7               | 11.7         | 0.001*  |
| <b>Answer patient's questions</b>   |             |              |                 |              |         |
| Yes   | 47          | 39.5         | 17              | 28.3         | 0.002*  |
| <b>Provide information on risks and possible complications of treatment</b> |             |              |                 |              |         |
| Yes   | 76          | 63.9         | 32              | 53.3         | 0.001*  |
| <b>Informing length of hospital stay</b>                                    |             |              |                 |              |         |
| Yes   | 64          | 53.8         | 31              | 51.7         | 0.79    |
| <b>Ensured privacy during examination</b>                                   |             |              |                 |              |         |
| Yes   | 79          | 66.4         | 32              | 53.3         | 0.001*  |
| <b>Do you follow any guidelines in practice?</b>                            |             |              |                 |              |         |
| Yes   | 49          | 41.2         | 22              | 36.7         | 0.001*  |
| <b>Complied with rules of confidentiality</b>                               |             |              |                 |              |         |
| Yes   | 53          | 44.5         | 16              | 26.7         | 0.05*   |
| <b>How did you get your knowledge of healthcare ethics and law?</b>         |             |              |                 |              |         |
| <b>Undergraduate lecture</b>  |             |              |                 |              |         |
| Yes   | 30          | 25.0         | 14              | 23.3         | 0.001*  |
| <b>During training</b>  |             |              |                 |              |         |
| Yes   | 54          | 45.0         | 28              | 46.7         | 0.83    |
| <b>Experience at work</b>   |             |              |                 |              |         |
| Yes   | 93          | 77.5         | 51              | 85.0         | 0.24    |
| <b>Lecture</b>  |             |              |                 |              |         |
| Yes   | 24          | 20.0         | 4               | 6.7          | 0.02*   |
| <b>Own reading</b>  |             |              |                 |              |         |
| Yes   | 36          | 30.0         | 6               | 10.0         | 0.003*  |
| <b>Others</b>   |             |              |                 |              |         |
| Yes   | 20          | 16.7         | 3               | 5.0          | 0.03*   |
| <b>Religion</b>   |             |              |                 |              |         |
| Yes   | 69          | 57.5         | 57              | 95.0         | 0.001*  |
| <b>Questions related to consent</b>   |             |              |                 |              |         |
| <b>Where did patient sign the treatment consent form?</b>                   |             |              |                 |              |         |
| In a clinic   | 10          | 8.4          | 0               | 0.0          | 0.07    |
| At hospital reception   | 89          | 74.9         | 52              | 86.6         |         |
| In a patient room   | 20          | 16.8         | 8               | 13.3         |         |
| <b>Who are the relatives possible to sign the consent?</b>                  |             |              |                 |              |         |
| Patient family  | 104         | 87.39        | 57              | 95.0         | 0.11    |
| Patient friend  | 9           | 7.6          | 0               | 0.0          |         |
| Colleague friend  | 6           | 5.04         | 3               | 5.0          |         |
| <b>Who obtain the informed consent?</b>                                     |             |              |                 |              |         |
| Operating surgeon himself   | 21          | 17.6         | 0               | 0.0          | 0.001*  |
| Junior doctor   | 75          | 63.0         | 7               | 11.7         |         |
| Staff nurse on duty   | 23          | 19.3         | 53              | 88.3         |         |
| <b>Do patients receive a copy of signed consent form?</b>                   |             |              |                 |              |         |
| No  | 83          | 69.7         | 50              | 83.3         | 0.006*  |
| I don't Know  | 18          | 15.1         | 0               | 0.0          |         |
| Yes   | 18          | 15.1         | 10              | 16.7         |         |
| <b>Total</b>  | <b>119</b>  | <b>100.0</b> | <b>60</b>       | <b>100.0</b> |         |

\*Significant P value

**Table 5:** Knowledge, attitude and practice scores and percent among educational and non-educational hospitals:

|                       | Groups          | N   | Mean    | Std. Deviation | p value |
|-----------------------|-----------------|-----|---------|----------------|---------|
| Total knowledge score | Educational     | 118 | 31.5530 | 4.33938        | 0.001*  |
|                       | Non-educational | 60  | 28.8813 | 2.59435        |         |
| Knowledge percent     | Educational     | 118 | 70.1177 | 9.64307        | 0.001*  |
|                       | Non-educational | 60  | 64.1806 | 5.76521        |         |
| Total practice score  | Educational     | 115 | 28.5913 | 3.21972        | 0.012*  |
|                       | Non-educational | 60  | 27.6833 | 2.52104        |         |
| Practice percent      | Educational     | 115 | 63.5362 | 7.15493        | 0.012*  |
|                       | Non-educational | 60  | 61.5185 | 5.60231        |         |
| Total attitude score  | Educational     | 119 | 23.3529 | 2.26838        | 0.85    |
|                       | Non-educational | 60  | 23.2333 | 1.49991        |         |
| Attitude percent      | Educational     | 119 | 72.9779 | 7.08870        | 0.85    |
|                       | Non-educational | 60  | 72.6042 | 4.68721        |         |

\*Significant P value

**Table 6:** Knowledge, attitude and practice score by specialties

|                       | Specialty |      |           |      |                    |      |          |      | P-value  |
|-----------------------|-----------|------|-----------|------|--------------------|------|----------|------|----------|
|                       | Surgery   |      | obstetric |      | Ophthalmology& ENT |      | medicine |      |          |
|                       | Mean      | SD   | Mean      | SD   | Mean               | SD   | Mean     | SD   |          |
| Total knowledge score | 29.30 b   | 3.39 | 29.46 b   | 3.52 | 32.58 a            | 3.94 | 31.28 ab | 4.39 | < 0.001* |
| Total practice score  | 27.49 b   | 3.22 | 28.39 ab  | 2.30 | 29.36 a            | 2.16 | 27.96 ab | 3.81 | 0.028*   |
| Total attitude score  | 22.71     | 2.05 | 23.60     | 2.64 | 23.68              | 1.47 | 23.27    | 1.71 | 0.098    |

\*Significant P value

Groups sharing same letter are not significantly different by Anova test

**Table 7:** Regression Coefficients a for total practice score with different predictors

| Model |                       | Unstandardized Coefficients |            | Standardized Coefficients | T       | p value |
|-------|-----------------------|-----------------------------|------------|---------------------------|---------|---------|
|       |                       | B                           | Std. Error | Beta                      |         |         |
| 1     | (Constant)            | 24.764                      | 3.390      |                           | 7.304   | .000    |
|       | Gender                | .209                        | .514       | .033                      | .406    | .686    |
|       | Age                   | .135                        | .115       | .103                      | 1.178   | .241    |
|       | Groups                | -1.113-                     | .508       | -.175-                    | -2.191- | .030    |
|       | Specialty             | .299                        | .234       | .112                      | 1.277   | .203    |
| 2     | (Constant)            | 20.086                      | 3.727      |                           | 5.389   | .000    |
|       | Gender                | .230                        | .505       | .037                      | .455    | .650    |
|       | Age                   | .104                        | .113       | .080                      | .926    | .356    |
|       | Groups                | -.594-                      | .532       | -.093-                    | -1.117- | .266    |
|       | Specialty             | .108                        | .240       | .040                      | .450    | .653    |
|       | Total knowledge score | .174                        | .063       | .228                      | 2.778   | .006*   |
| 3     | (Constant)            | 8.631                       | 4.118      |                           | 2.096   | .038    |
|       | Gender                | .861                        | .485       | .137                      | 1.773   | .078    |
|       | Age                   | .083                        | .105       | .063                      | .785    | .433    |
|       | Groups                | -.580-                      | .496       | -.091-                    | -1.171- | .243    |
|       | Specialty             | -.055-                      | .225       | -.020-                    | -.242-  | .809    |
|       | Total knowledge score | .133                        | .059       | .174                      | 2.255   | .025*   |
|       | Total attitude score  | .552                        | .107       | .374                      | 5.170   | .000*   |

a. Dependent Variable: Total practice score

\*Significant P value