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Araştırma Makalesi/ Research Article

# THE RELATIONSHIP BETWEEN ARTIFICIAL INTELLIGENCE CONCERNS AND PERCEIVED SPIRITUAL CARE IN INTERNAL MEDICINE NURSES

DAHİLİYE HEMŞİRELERİNİN YAPAY ZEKÂ KAYGILARI VE MANEVİ

BAKIM ALGILARI ARASINDAKİ İLİŞKİ

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#### Abstract

**Aim:** This study aimed to determine the relationship between artificial intelligence concerns and perceived spiritual care in internal medicine nurses.

**Methods:** This descriptive correlational study was conducted between October 13, 2021 and March 12, 2022. The sample of the study consisted of 477 internal medicine nurses. The data were collected using a 'Nurse Information Form', 'Artificial Intelligence Anxiety Scale' and 'Spirituality and Spiritual Care Rating Scale'. Data were analyzed by independent-samples t test, One-Way ANOVA, Bonferroni test, Pearson's correlation test and linear regression analysis.

**Results:** The majority of the nurses were 26-32 age group (33.3%), female (63.1%), married (54.9%), had bachelor's degree (58.7%) and professional experience of 6-10 years (35.6%). Their Artificial Intelligence Anxiety Scale and Spirituality and Spiritual Care Rating Scale total mean scores were  $95.35\pm4.02$  and  $63.50\pm3.14$ , respectively. A highly significant negative correlation was found between their AIAS and Spirituality and Spiritual Care Rating Scale total mean scores (r =-0.785, p = 0.041). Their artificial intelligence concerns negatively affected their perceived spiritual care (F= 36.140, p<0.05, R = .840).

**Conclusion**: Internal medicine nurses had moderate Artificial Intelligence Anxiety Scale mean score and high Spirituality and Spiritual Care Rating Scale mean score. As their Artificial Intelligence Anxiety Scale mean score increased, their Spirituality and Spiritual Care Rating Scale mean score decreased. **Keywords**: Internal Medicine, Nurse, Artificial Intelligence, Spiritual Care Perception.

#### Özet

Amaç: Bu araştırmanın amacı, dahiliye hemşirelerinin yapay zekâ konusundaki kaygıları ve manevi bakım algıları arasındaki ilişkinin belirlenmesidir.

**Yöntem:** Bu araştırma, tanımlayıcı ve ilişkisel olarak yapıldı. Örneklemi 13.10.2021-12.03.2022 tarihleri arasında 477 dâhiliye hemşiresi oluşturdu. Veriler, 'Hemşire Bilgi Formu, "Yapay Zekâ Kaygı Ölçeği" ve "Maneviyat ve Manevi Bakım Algılama Ölçeği" kullanılarak toplandı. Veriler, Independent-Samples t testi, One-Way ANOVA testi, Bonferroni testi, Pearson Korelasyon testi ve Linear Regresyon ile analiz edildi.

**Bulgular:** Hemşirelerin büyük çoğunluğu 26-32 yaş grubunda (%33.3), kadın (%63.1), evli (%54.9), üniversite mezunu (%58.7) ve 6-10 yıldır çalışmaktadır (%35.6). Hemşirelerin Yapay Zekâ Kaygı Ölçeği toplam puan ortalamasının 95.35±4.02, Maneviyat ve Manevi Bakım Algılama Ölçeği puan ortalamasının ise  $63.50\pm3.14$  olduğu bulundu. Hemşirelerin Yapay Zekâ Kaygı Ölçeği toplam puanı ile Maneviyat ve Manevi Bakım Algılama Ölçeği toplam puanı arasında negatif yönde yüksek derecede anlamlı bir ilişki olduğu saptandı (r =-0.785, p = 0.041). Hemşirelerin yapay zekâ kaygılarının manevi bakım algısı üzerinde etkili olduğu belirlendi (F= 36.140, p<0,05, R = .840).

**Sonuç**: Dahiliye hemşirelerinin Yapay Zekâ Kaygı Ölçek puan ortalamalarının orta düzeyde, Maneviyat ve Manevi Bakım Algılama Ölçek puan ortalamasının ise yüksek düzeyde olduğu bulundu. Hemşirelerin Yapay Zekâ Kaygısı Ölçeği puan ortalaması arttıkça Maneviyat ve Manevi Bakım Algılama Ölçeği puan ortalamasının azaldığı belirlendi.

Anahtar Kelimeler: Dahiliye, Hemşire, Yapay Zekâ, Manevi Bakım Algısı.

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#### INTRODUCTION

Artificial Intelligence (AI) is an abstract concept and has become an intriguing subject today. The term of artificial intelligence dates back to the 1950s and can be briefly defined as "the science of machines that can think like humans" (1, 2). In its broader definition, AI is considered a science that contributes to the development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages (1, 3).

Artificial intelligence is rapidly affecting the field of health, as it affects many fields today (2). AI takes place in many areas in health. AI technologies are used in several health-related fields such as early diagnosis, accurate diagnosis, clinical decision making, and maintenance of health (4, 5). In China, radiologists are using artificial intelligence technologies to improve medical diagnosis and identify suspicious lesions and nodules in lung while reading cancer patients brain tomography scans and x-rays (2, 3). An AI platform is used in the USA to analyze oncology treatments and to observe if artificial intelligence can design drugs with fewer side effects (3, 4). In addition, robot nurses have provided care to patients in isolation during the COVID-19 pandemic, thus eliminating the possibility of virus transmission between nurses and patients (5). Case studies report that AI, with its ability to process information, can largely eliminate the problem of misdiagnosis and medical errors in health, and can be used to reduce the rate of medical malpractice and increase healthcare productivity (6, 7).

Nurses constitute the majority of healthcare workers and play an active role in the provision of health services (8, 9). Nursing profession has to change and develop in order to meet healthcare needs of people in today's new world (8). Internal medicine nurses, who serve a wide range of patients, need to adopt innovative approaches and AI-supported technologies while providing health services in many different areas such as health promotion, education, counseling and research (7, 9). Several reasons such as increased nursing workload and shortage of nurses will increase the use of AI supported care robots in nursing, whereby these robots will support nurses' delivery of care services (4, 8, 10).

Nurses are worried that AI may have negative effects besides its positive contributions to patient treatment and care. Programming a robot by AI to imitate human movements and make clinical decisions may pose risks for the nursing profession (11, 12), including patient privacy, ethical issues, and discussions about the ability of providing spiritual care (5, 11).

A holistic care approach, considering people' physical, spiritual, economic, cultural, emotional and spiritual aspects, constitutes the essence of nursing in today's health care services (14, 15). Spiritual and psychosocial needs are intangible and complexes compared to physical needs, and are also difficult to measure. Therefore, physical needs, which can be measured more easily, are handled first in the health care of individuals, whereas spiritual needs can be overlooked (13,16). Spirituality affects one's health, illness, well-being and quality of life (8, 9).

Artificial intelligence robots can meet physical needs of patients during treatment and care processes. Therefore, one of the primary responsibilities of nurses is to meet spiritual care needs of patients and their relatives and will not be performed through artificial intelligence robots. In its history, nursing has never been perceived as a profession to provide only physical care (12, 13). Considering the need for emotions such as compassion and empathy for patients, AI robots will be lacking at this point (17, 18). There is no study on the relationship between AI concerns and perceived spiritual care in internal medicine nurses. Considering the power of spiritual care in patient recovery, this is a significant study as it evaluates the relationship between AI and spiritual care and examines the perceptions of internal medicine nurses regarding the use of AI in health and spiritual care.

This study aimed to determine the relationship between artificial intelligence concerns and perceived spiritual care in internal medicine nurses.

#### METHODS

#### Study Type

This is a correlational descriptive study.

#### **Population and Sample**

The population of the study consisted of all nurses (N:603) in the internal medicine clinics of one state hospital and one university hospital in Malatya, Turkey and the sample included those who worked in internal medicine clinics (internal medicine. cardiology, neurology, internal medicine intensive care, chest and dialysis) and agreed to participate in the study. No sampling method was used to reach the entire population. The sample consisted of a total of 477 internal medicine nurses who were not on leave between October 13, 2021 and March 12, 2022 and agreed to participate in the study. The participation rate was 79.0%.

## **Data Collection Tools**

The data were collected using a nurse information form (5, 6, 8, 10, 12), the Artificial Intelligence Anxiety Scale (AIAS) and the Spirituality and Spiritual Care Rating Scale (SSCRS). A preliminary application was made with five nurses to finalize the questionnaire. The data were collected using face-to-face interview technique, following the mask, hygiene and social distance rules. Nurses first were informed about the purpose of the study and the questionnaire, and their written and verbal consents were obtained. The questionnaire lasted around 10-15 minutes to fill in.

## Nurse Information Form

The form consists of a total of 10 questions, including five about the characteristics of nurses (age, gender, marital

status, education level, work experience), three about their knowledge of artificial intelligence (status of having knowledge about artificial intelligence, status of having information about the use of artificial intelligence in health, status of using an application with artificial intelligence), and two about spiritual care (status of knowing about spiritual care and getting training about spiritual care) (5, 6, 8, 10, 12).

## Artificial Intelligence Anxiety Scale (AIAS)

The scale was developed by Wang & Wang (2019) and adapted into Turkish by Akkaya et al. (2021). This is a 7-point Likerttype scale that asks each participant to reflect their current experiences. It has four subscales: learning, job replacement, sociotechnical blindness, and artificial intelligence configuration. The lowest and highest scale scores are 21 and 147, respectively. A higher score indicates higher artificial intelligence anxiety (19). The Cronbach's alpha coefficient of the scale was found to be 0.93 (20). In this study, the Cronbach' alpha coefficient of the scale was determined as 0.92.

# Spirituality and Spiritual Care Rating Scale (SSCRS)

The scale was developed by Mcshreey Draper and Kendric (2002) (21). This is a fivepoint Likert-type scale, scoring from 1 to 5 and consisting of 17 items. Four items (3, 4, 13, 16) are scored in reverse. The lowest and highest scale scores are 17 and 85, respectively. A higher score indicates positive perception towards spirituality and spiritual care. The Cronbach' alpha coefficient of the scale was found to be 0.64 (21). Ergül and Temel (2007), who adapted this scale into Turkish, found the Cronbach's alpha coefficient of the scale as 0.76 (22). In this study, the Cronbach' alpha coefficient of the scale was determined as 0.78.

## **Data Evaluation**

The data were analyzed using the SPSS 24.0 (Statistical Package for the Social Sciences) and evaluated using descriptive

statistics. The Kolmogrow-Smirnow test was used to check the data for normal distribution. The Cronbach's alpha value was found using reliability analysis. Independent-samples t-test was used to compare two independent groups for normally distributed variables. One-Way ANOVA test was used to compare more than two independent groups. Bonferroni test, one of the post-hoc analysis methods, was used to determine which group caused the difference in more than two groups. Pearson's correlation test was used for correlation analysis. Linear regression analysis was used to examine the predictors of perceived spiritual care. A pvalue less than 0.05 was considered statistically significant.

## **Ethical considerations**

For conducting the study, a written permission was obtained from the author, who conducted the Turkish validity and reliability study of the scale, via e-mail. In addition, a written permission was obtained from the institutions where the study was conducted; verbal and written consents from nurses who agreed to participate in the study; and an approval from the Inönü University Non-Interventional Ethics Committee (Decision Number: 2021-29/10). The study complied with research and publication ethics.

## Limitations

This study cannot be generalized to all internal medicine nurses in Turkey and is limited to those who work in the hospitals where the study was conducted and agreed to participate in the study.

# RESULTS

The majority of the nurses were between 26-32 years old (33.3%), female (63.1%), married (54.9%) and had bachelor's degree (58.7%) and working experience of 6-10 years (35.6%). The vast majority of them did not know about artificial intelligence (58.5%), did not have knowledge about the use of artificial intelligence in health (66.2%), did not use an application with artificial intelligence (76.7%), knew about spiritual care

(83.4%), and did not receive training for spiritual care (65.6%) (Table 1). There was a statistically significant difference between the nurses' AIAS mean scores according to their knowledge about artificial intelligence and the use of artificial intelligence in health, where the difference was due to the those without such knowledge (p < 0.05). In addition, there was a statistically significant difference between the nurses' SSCRS mean scores in terms of gender, marital status, working experience, status of having knowledge about the use of artificial intelligence in health, status of knowing about spiritual care, and status of getting education about spiritual care (p<0.05). The difference between them was caused by female nurses, married nurses, nurses with working experience of 16 years or more, those who did not know about the use of artificial intelligence in health, those who knew spiritual care, and those who received training about spiritual care (p<0.05) (Table 1).

The nurses' mean scores were  $95.35\pm4.02$  for AIAS,  $39.17\pm4.00$  for learning,  $27.00\pm3.46$  for job replacement,  $16.92\pm4.18$  for sociotechnical blindness, and  $13.48\pm4.35$  for artificial intelligence configuration. Their SSCRS mean score was found to be  $63.50\pm3.14$  (Table 2).

There was a highly significant negative correlation between the nurses' AIAS and SSCRS total mean scores (r=-0.785, p= 0.041). There was no significant relationship between their SSCRS total mean score and AIAS subscales mean scores (p>0.05) (Table 3).

The nurses' artificial intelligence concerns affected their perceived spiritual care, where R<sup>2</sup>=0.71 (F= 36.140, p<0.05, R = .840). It was determined that 70.5% of the total variance in the nurses' SSCRS total score was explained by their AIAS total score, and the result was statistically significant (B=-0.188, SE=0.010,  $\beta$ =-0.455 t=-9.125, p<0.001) (Table 4).

| Table   | 1.   | Comparison    | of | AIAS | and | SSCRS | total | scores | according | to | nurses' | descriptive |
|---------|------|---------------|----|------|-----|-------|-------|--------|-----------|----|---------|-------------|
| charact | teri | stics (n=477) |    |      |     |       |       |        |           |    |         |             |

| Age Groups<br>18-2594<br>26-3219.7<br>33.4095.174-4.00<br>95.174-4.0063.50 $\pm$ 3.14<br>62.94 $\pm$ 3.57<br>63.55 $\pm$ 3.3<br>95.65 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.08<br>63.55 $\pm$ 4.01<br>63.55 $\pm$ 4.01<br>63.55 $\pm$ 4.01<br>63.55 $\pm$ 4.02<br>63.16 $\pm$ 3.02<br>67.22 $\pm$ 3.00<br>95.1014.28<br>10.025 p.00.811<br>10.025 p.00.811<br>10.025 p.00.811<br>10.025 p.00.811<br>10.025 p.00.23*Education level<br>High school<br>University<br>Post radue p103<br>21.6<br>9421.6<br>95.18 $\pm$ 4.65<br>95.18 $\pm$ 4.02<br>63.16 $\pm$ 3.22<br>63.16 $\pm$ 3.22<br>95.001.3.12<br>color p.0.023*63.18 $\pm$ 3.95<br>10.025 p.0.023*Education level<br>High school<br>University<br>Post radue p210<br>240<br>24021.6<br>95.18 $\pm$ 4.02<br>95.1014.28<br>53.70 $\pm$ 3.00<br>F2.1910.050163.18 $\pm$ 3.95<br>10.025 p.0.023*Married<br>Single<br>-10 vars262<br>242<br>245<br>24554.1<br>95.2014.13<br>95.2014.13<br>(22.904 $\pm$ 3.10<br>(22.94 $\pm$ 3.23<br>(22.94 $\pm$ 3.23<br>(22.94 $\pm$ 3.23<br>(22.94 $\pm$ 3.23<br>(23.96)<br>(23.95)64.02 $\pm$ 2.54<br>(23.96)<br>(23.96)<br>(23.96)Vears of work in the profession<br>0.5 years<br>(-10 years and up<br>Test value p20.75<br>10.24 ±1.96<br>(21.92 ±1.00)64.02 $\pm$ 2.54<br>(22.94 $\pm$ 3.23<br>(23.94)<br>(24.94)<br>(24.95).2063.57 $\pm$ 3.04<br>(22.94 $\pm$ 3.23<br>(23.95)Calming knowledge about the concept of<br>artificial intelligence<br>Yes<br>No<br>Test value p111<br>23.3<br>23.84<br>(23.92)<br>(24.41.04)<br>(24.92)<br>(24.92).201111<br>(23.36)<br>(24.92).2023.23.04<br>(24.92).23<br>(24.92).23<br>(24.92).23<br>(24.92).23<br>(24.92).23<br>(24.92).23<br>(24.92).23<br>(24.92).24<br>(25.92).24.10<br>(24.92).24.10  | Descriptive Characteristics  | n        | %    | AIAS                             | SSCRS                        |
|---|--|----------|------|----------------------------------|------------------------------|
| $18_{25}$ 94 $19,7$ $91,724,00$ $63,50\pm3,14$ $26-32$ $159$ $33,3$ $95,0\pm4,73$ $62,94\pm3,57$ $3-40$ $135$ $28,3$ $95,0\pm4,16$ $63,50\pm3,10$ $41$ and up $89$ $18,7$ $95,0\pm4,16$ $63,50\pm3,10$ $18x7$ $95,0\pm4,10$ $63,50\pm3,10$ $63,0\pm3,10$ $63,10$ $94,97\pm4,90$ $67,22\pm3,00$ $18abc$ $76,50+90$ $72,2\pm3,00$ $75,0\pm4,20$ $67,22\pm3,00$ $78,00+3,12$ $194,97\pm4,90$ $95,10\pm4,20$ $63,16\pm3,82$ $99,90,22^{3*}$ $79,00+3,12$ $70,005,p0,023^{3*}$ $103$ $21.6$ $95,18\pm4,65$ $63,18\pm3,95$ $63,16\pm3,82$ $95,00\pm3,75$ $64,02\pm2,54$ $95,00\pm3,75$ $64,02\pm2,54$ $64,02\pm2,54$ $62,00\pm3,10$ $10,306$ $p6,00\pm3,00$ $p1,602$ $10,306$ $p1,6014,10$ $10,306$ $p1,6014,10$ $10,306$ $p1,6014,10$ $10,306$ $p2,94,004,12$ $10,306$ $10,212,54$ $23,904,112$ $10,306$ $10,212,54$ $23,904,112$ $10,306,10,210$ $10,306,10,210$ $10,306,10,210$ $10,30,210,10$   | Age Groups   |          |      |                                  |                              |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $  | 18-25  | 94       | 19.7 | $95.17{\pm}4.00$                 | 63.50±3.14                   |
| 33-40       135       28.3       95.65±4.08       63.05±3.10         41 and up       89       18.7       95.19±4.16       63.56±3.26         Fit.0805       0.41       Fit.0805       0.41         Gender       301       63.1       94.97±4.90       67.22±3.00         Male       176       36.9       95.10±4.28       59.90±3.12         Condor Iveu       176       36.9       95.18±4.65       63.18±3.95         University       280       58.7       95.35±4.02       63.16±3.82         Posigraduate       94       19.7       94.7±3.84       63.70±3.00         Test value $p$ 103       21.6       95.18±4.65       63.18±3.95         Marital staus       64.02±2.54       95.00±3.75       64.02±2.54         Marital staus       262       54.9       95.00±3.75       64.02±2.54         Single       112       23.55       94.60±4.65       58.08±3.69         C-10 years       1170       35.6       94.13±4.02       62.4±3.23         11-5 years       115       24.1       96.00±3.20       65.3±3.04         Test value $p$ 70       35.6       94.15±4.20       62.3±2.04         Yes       198 </td <td>26-32</td> <td>159</td> <td>33.3</td> <td>95.02±4.73</td> <td>62.94±3.57</td>  | 26-32  | 159      | 33.3 | 95.02±4.73                       | 62.94±3.57                   |
| 41 and up<br>Test value $p$ 89       18.7       95,1944,16<br>F1.040       63,5643,26<br>F1.040       63,5643,26<br>F1.040       63,1643,26<br>F1.040       63,1643,26<br>F1.040       63,1643,26<br>F1.040       63,1643,26<br>F1.040       67,2243,00<br>67,2243,00         Gender       301       63,1       94,97144,90<br>94       67,2243,00       67,2243,00         High school       103       21,6       95,1844,65       63,1843,95         University       94       19.7       94,7343,84       63,7043,00         Fest value $p$ 262       54.9       95,0043,75       64,0242,54         Single       215       45.1       95,2044,13       62,2043,10         Test value $p$ 112       23.5       94,6044,65       58,8043,69         0-5 years       170       35,6       94,134,402       62,453,23         11-1-5 years       170       35,6       94,134,402       62,453,23         16 years and up       80       16.8       96,0043,20       65,3243,04         Test value $p$ 100       11.5       24,1       63,744,79       61,543,00         16 years and up       279       58,5       99,1644,10       63,743,46       63,6643,23         No       166       33,8       90,874,116<  | 33-40  | 135      | 28.3 | $95.65 \pm 4.08$                 | $63.05 \pm 3.10$             |
| Test value $p$ $rest value       p $  | 41 and up  | 89       | 18.7 | 95.19±4.16                       | 63.56±3.26                   |
| Gender<br>Female         301<br>Male         63.1<br>(76)         94.97 $\pm$ 4.90<br>(5.9)         67.22 $\pm$ 3.00<br>(57.22 $\pm$ 3.00)           Education level         176         36.9         95.10 $\pm$ 4.28         59.90 $\pm$ 3.12           High school         103         21.6         95.18 $\pm$ 4.65         63.18 $\pm$ 3.95           Diversity         280         58.7         95.35 $\pm$ 4.02         63.70 $\pm$ 3.00           Fest value         p         19.7         94.73 $\pm$ 3.84         63.70 $\pm$ 3.00           Married         262         54.9         95.00 $\pm$ 3.75         64.02 $\pm$ 2.54           Single         215         45.1         95.20 $\pm$ 4.13         62.90 $\pm$ 3.10           Test value p         2215         45.1         95.00 $\pm$ 3.75         64.02 $\pm$ 2.54           Single         215         45.1         95.20 $\pm$ 4.13         62.90 $\pm$ 3.10           Test value p         112         23.5         94.60 $\pm$ 4.65         58.08 $\pm$ 3.69           0-19 years         115         24.1         96.00 $\pm$ 3.20         65.32 $\pm$ 3.04           Test value p         80         16.8         96.00 $\pm$ 3.20         65.32 $\pm$ 3.04           Test value p         100         80         16.8         99.16 $\pm$ 4.10         63.37 $\pm$ 3.17           Test value p  | Test value p   |          |      | F:1.940 0.142                    | F:1.085 0.417                |
| Female       301       63.1       94.97±4.90       67.22±3.00         Male       176       36.9       95.10±4.28       59.90±3.12         Test value $p$ 103       21.6       95.15±4.28       59.90±3.12         Education level       103       21.6       95.15±4.02       63.16±3.82         Postgraduate       94       19.7       95.35±4.02       63.16±3.82         Postgraduate       94       19.7       94.73±3.84       63.70±3.00         Test value $p$ 262       54.9       95.00±3.75       64.02±2.54         Single       215       45.1       95.20±4.13       62.90±3.10         Test value $p$ 112       23.5       94.60±4.65       58.08±3.69         Vears of work in the profession       0.5       years       112       23.5       94.13±4.02       62.45±3.23         11-15 years       115       24.1       96.07±4.79       61.50±3.00       16 years and up       65.32±3.04         Test value $p$ 80       16.8       96.01±4.65       53.24±3.04       63.70±3.17         Yes       198       41.5       91.55±4.20       62.83±2.06       63.79±3.17         Test value $p$ 127       91.00.077  | Gender   |          |      |                                  |                              |
| Male<br>Test value         176         36.9         95.10 $\pm$ 4.28         59.90 $\pm$ 3.12           Education level         103         21.6         95.18 $\pm$ 4.65         63.18 $\pm$ 3.95           University         280         58.7         95.35 $\pm$ 4.02         63.16 $\pm$ 3.82           Postgraduate         94         19.7         94.73 $\pm$ 3.84         63.70 $\pm$ 3.00           Test value         p         19.7         94.73 $\pm$ 3.84         63.70 $\pm$ 3.00           Married         262         54.9         95.00 $\pm$ 3.75         64.02 $\pm$ 2.54           Single         215         45.1         95.00 $\pm$ 3.75         64.02 $\pm$ 2.54           Single         215         45.1         95.00 $\pm$ 3.75         64.02 $\pm$ 2.54           Single         215         45.1         95.00 $\pm$ 3.75         64.02 $\pm$ 2.54           Oroperation         0         0         0.05         0.228         0.011         10.30         0.101         10.512         10.308         0.01914           Yeas         0 years         112         23.5         94.60 $\pm$ 4.65         58.08 $\pm$ 3.69         65.32 $\pm$ 3.23         61.50 $\pm$ 3.20         65.32 $\pm$ 3.23         11.5         24.1         66.00 $\pm$ 3.20         65.32 $\pm$ 3.23         16.8         96.00 $\pm$ 3.20         65.32 $\pm$ 3  | Female   | 301      | 63.1 | 94.97±4.90                       | 67.22±3.00                   |
| Test value $p$ $c$  | Male   | 176      | 36.9 | 95.10±4.28                       | 59.90±3.12                   |
| Education level         103         21.6         95.184.4.65         63.1843.95           High school         103         21.6         95.184.4.65         63.1643.82         63.7043.00           Postgraduate         94         19.7         94.7343.84         63.7043.00         F1.660         0.959         F2.191         0.501           Married         262         54.9         95.0043.75         64.0242.54         62.0943.10           Test value $p$ 215         45.1         95.2044.13         62.9043.10         t0.368 pt.0.914           Years of work in the profession         0.5 years         112         23.5         94.6044.65         58.0843.69           6-10 years         1170         35.6         94.1344.02         62.454.323         11-15 years           11-1 Syears         115         24.1         96.074.479         61.5043.00         63.3243.04           Test value $p$ 70         35.6         94.1344.02         62.8342.06         63.7943.10           Gaining knowledge about the concept of artificial intelligence         Yes         91.554.420         63.8342.04         F2.106 0.077         F1.700 0.015*           Test value $p$ 70         164         33.8         90.8744.16         63.5743.46  | Test value p   |          |      | t:0.065 p:0.811                  | t:0.026 p: <b>0.023</b> *    |
| Link and the transmission10321.695.18±4.6563.18±3.95University28058.795.35±4.0263.16±3.82Postgraduate9419.794.73±3.8463.70±3.00Test value $p$ F1.6600.959F2.1910.501Married26254.995.00±3.7564.02±2.54Single21551.995.20±4.13c2.90±3.10Test value $p$ 11223.594.60±4.6558.08±3.690-5 years17035.694.13±4.0262.45±3.2311-15 years11524.196.07±4.7961.50±3.0016 years and up8016.890.60±3.2065.32±3.04Test value $p$ 11524.196.07±4.7961.50±3.0016 years and up8016.899.16±4.1063.79±3.17Test value $p$ 11841.591.55±4.2062.83±2.06No27958.599.16±4.1063.57±3.46No31666.2100.38±4.8363.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46Yes11123.395.91±3.9763.57±3.46No31666.2100.38±4.8363.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46No39883.495.34±4.0668.05±3.01Test value $p$ 11123.395.91±3.9763.57±3.46No10695.00±4.3258.1±3.00t1.1013 p.0.105Knowing Spiritual Care  | Fducation level  |          |      |                                  | 1                            |
| Toge of the second s | High school  | 103      | 21.6 | 95 18+4 65                       | 63 18+3 95                   |
| Designation<br>Test value<br>$p$ P4 <td>University</td> <td>280</td> <td>58.7</td> <td>95 35+4 02</td> <td>63 16+3 82</td>  | University   | 280      | 58.7 | 95 35+4 02                       | 63 16+3 82                   |
| Test valuepIF:1.660 $p$ F:2.191 $0.501$ Married26254.9 $95.0\pm3.75$ $64.02\pm2.54$ Single215 $45.1$ $95.20\pm4.13$ $62.90\pm3.10$ Test valuep112 $23.5$ $94.60\pm4.65$ $58.0\pm3.69$ $0-5$ years112 $23.5$ $94.60\pm4.65$ $58.0\pm3.69$ $6-10$ years1170 $35.6$ $94.13\pm4.02$ $62.4\pm3.23$ $11-15$ years115 $24.1$ $96.07\pm4.79$ $61.50\pm3.00$ $16$ years and up8016.8 $96.00\pm3.20$ $65.32\pm3.04$ Test value $p$ $p$ $p$ $p$ $p$ $p$ Gaining knowledge about the concept of artificial intelligence $p$ $p$ $p$ Yes $198$ $41.5$ $91.55\pm4.20$ $62.83\pm2.06$ No $279$ $58.5$ $99.16\pm4.10$ $63.79\pm3.17$ Test value $p$ $p$ $t1.720$ $p0.003^{\circ}$ $t0.490$ Yes $161$ $33.8$ $90.87\pm4.16$ $63.57\pm3.46$ No $316$ $62.2$ $100.38\pm4.83$ $63.66\pm3.23$ Using an application that uses artificial intelligence $t1.920$ $p0.0017^{\circ}$ $t1.013$ Yes $151$ $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No $366$ $76.7$ $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ $t1.11$ $23.3$ $95.91\pm3.97$ $63.65\pm3.24$ Yes $10.61$ $76.7$ $96.22\pm4.10$ $63.66\pm3.23$ No $76.7$ $96.22\pm4.10$ $63$   | Postgraduate   | 94       | 19.7 | $94.73\pm3.84$                   | $63.70\pm3.00$               |
| Marital status         Marital status         Intervention         Intervention           Marital status         Marital status         262 $54.9$ $95.00\pm3.75$ $64.02\pm2.54$ Single         215 $45.1$ $95.00\pm3.75$ $64.02\pm2.54$ $62.90\pm3.10$ Test value $p$ 112 $23.5$ $94.60\pm4.65$ $58.08\pm3.69$ $61.0years$ $112.5years$ $112.5years$ $96.07\pm4.79$ $61.50\pm3.00$ $61.50\pm3.00$ 16 years and up         80 $16.8$ $96.00\pm3.20$ $65.32\pm3.04$ $F1.200.0.077$ $F1.1700.0.015^{**}$ Gaining knowledge about the concept of artificial intelligence         198 $41.5$ $91.55\pm4.20$ $62.83\pm2.06$ No         279 $58.5$ $99.16\pm4.10$ $63.79\pm3.17$ $c1.490 p:0.062$ To have knowledge about the use of artificial intelligence in health         161 $33.8$ $90.87\pm4.16$ $63.57\pm3.46$ No         316 $66.2$ $100.38\pm4.83$ $63.66\pm3.23$ $c1.0490 p:0.062$ Ves         111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ $62.6\pm3.23$ No <td>Test value <i>n</i></td> <td><i>,</i></td> <td>17.7</td> <td>F:1.660 0.959</td> <td>F:2.191 0.501</td>   | Test value <i>n</i>  | <i>,</i> | 17.7 | F:1.660 0.959                    | F:2.191 0.501                |
| Married<br>Single262<br>Single54.9<br>21595.0 $\pm 3.75$<br>95.2 $\pm 4.13$<br>(5.0 $\pm 3.10$ )64.0 $\pm 2.54$<br>62.9 $\pm 3.10$<br>(2.0 $\pm 3.10$ )Years of work in the profession<br>0-5 years91.2<br>117094.6 $\pm 4.65$<br>35.688.8 $\pm 3.69$<br>94.13 $\pm 4.02$<br>96.0 $\pm 3.20$<br>94.13 $\pm 4.02$<br>96.0 $\pm 3.20$<br>94.13 $\pm 4.02$<br>96.0 $\pm 3.20$<br>94.13 $\pm 4.02$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>97.994.6 $\pm 4.65$<br>94.13 $\pm 4.02$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>96.0 $\pm 3.20$<br>97.988.8 $\pm 3.69$<br>96.0 $\pm 3.20$<br>97.9Gaining knowledge about the concept of<br>artificial intelligence<br>Yes<br>No<br>Yes<br>Yes<br>198<br>Yes<br>  | Marital status   |          |      |                                  |                              |
| Single<br>Test value $p$ 21545.195.20±4.13<br>t.0.501 p:1.61262.90±3.10<br>t.0.368 p:0.914Years of work in the profession<br>0-5 years11223.594.60±4.6558.08±3.69<br>6.413±4.026-10 years11035.694.13±4.0262.45±3.2311-15 years11524.196.07±4.7961.50±3.0016 years and up<br>Test value $p$ 8016.896.00±3.2065.32±3.04Fest value $p$ 8016.899.16±4.1063.79±3.17Caining knowledge about the concept of<br>artificial intelligence91.55±4.2062.83±2.06No27958.599.16±4.1063.79±3.17Test value $p$ 16133.890.87±4.1663.57±3.46No31666.2100.38±4.8363.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46No36676.796.22±4.1063.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46No36676.796.22±4.1063.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46No36676.795.22±4.1063.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46No36676.795.22±4.1063.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46No36676.795.34±4.0668.05±3.01Test value $p$ 10.695.00±4.3258.14±3.00 <t< td=""><td>Married</td><td>262</td><td>54 9</td><td>95 00+3 75</td><td>64 02+2 54</td></t<>  | Married  | 262      | 54 9 | 95 00+3 75                       | 64 02+2 54                   |
| Darge<br>Test value $p$ The form<br>rest value $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the probability<br>the state $p$ Description of the the state  | Single   | 215      | 45.1 | 95 20+4 13                       | 62.90+3.10                   |
| Years of work in the professionInterpretationReverse provideReverse provide0-5 years11223.594.60±4.65 $58.08\pm3.69$ 6-10 years17035.694.13±4.02 $62.45\pm3.23$ 11-15 years11524.196.07±4.79 $61.50\pm3.00$ 16 years and up8016.8 $96.00\pm3.20$ $65.32\pm3.04$ Test value $p$ 11524.1 $96.00\pm3.20$ $65.32\pm3.04$ Gaining knowledge about the concept of artificial intelligence198 $41.5$ $91.55\pm4.20$ $62.83\pm2.06$ No279 $58.5$ $99.16\pm4.10$ $63.79\pm3.17$ $t0.490 p:0.062$ Test value $p$ 16133.8 $90.87\pm4.16$ $63.57\pm3.46$ No316 $66.2$ $100.38\pm4.83$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $95.20\pm4.10$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $95.20\pm4.20$ $58.14\pm3.00$ Test value $p$ 111 $23.3$ $95.91\pm3.27$ $58.5\pm3.01$ Test value $p$ 111 $23.6$ $95.34\pm4.06$ $68.05\pm3.01$ Test value $p$ 10.6 $95.00\pm4.32$ $58.14\pm3.00$ $t1.013 p:0.105$ Knowing Spiritual Care7916.6 $95.00\pm4.32$ $58.14\pm3.00$ <   | Test value <i>n</i>  | 210      | 10.1 | t:0.501 p:1.612                  | t:0.368 p:0.914              |
| Test sol work in the profession11223.594.60±4.6558.08±3.690-5 years17035.694.13±4.02 $62.45\pm3.23$ 11-15 years11524.196.07±4.79 $61.50\pm3.00$ 16 years and up8016.896.00±3.20 $65.32\pm3.04$ Test value $p$ rest value $p$ rest value $p$ rest value $p$ $rest value p$ $62.83\pm2.06$ Caining knowledge about the concept of artificial intelligence19841.5 $91.55\pm4.20$ $62.83\pm2.06$ No27958.5 $99.16\pm4.10$ $63.79\pm3.17$ $t0.490 p.0.062$ To have knowledge about the use of artificial intelligence in health161 $33.8$ $90.87\pm4.16$ $63.57\pm3.46$ No31666.2100.38\pm4.83 $63.66\pm3.23$ $t1.920 p.0.017*$ $t1.013 p.0.105$ Using an application that uses artificial intelligence111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.65\pm3.23$ Ves398 $83.4$ $95.34\pm4.06$ $68.05\pm3.01$ No366796.22\pm4.10 $63.66\pm3.23$ Test value $p$ 116.6 $95.00\pm4.32$ $58.14\pm3.00$ Ves116.6 $95.00\pm4.32$ $58.14\pm3.00$ No398 $83.4$ $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ 16.6 $95.00\pm4.32$ $58.14\pm3.00$ Ves16.6 $96.20\pm4.30$ $57.66\pm3.88$ No16.6 $96.0$   | Voor of more in the medeanien  |          |      | tione of princing                |                              |
| 112       23.3 $94.0144.02$ $58.0025.09$ 6-10 years       115       24.1 $96.0144.02$ $62.454.32.3$ 11-15 years       115       24.1 $96.00744.79$ $61.50\pm3.00$ 16 years and up       80       16.8 $96.0043.20$ $65.3243.04$ Test value $p$ F:1.700 $0.015*$ F:1.700 $0.015*$ Gaining knowledge about the concept of artificial intelligence $79$ $58.5$ $91.55\pm4.20$ $62.83\pm2.06$ No       279 $58.5$ $99.16\pm4.10$ $63.79\pm3.17$ t:0.490 p:0.062         To have knowledge about the use of artificial intelligence in health $112$ $33.8$ $90.87\pm4.16$ $63.57\pm3.46$ No       316 $66.2$ $100.38\pm4.83$ $63.66\pm3.23$ t:1.013 p:0.105         Using an application that uses artificial intelligence $1111$ $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No $166$ $79$ $62.24\pm1.0$ $63.66\pm3.23$ t:1.013 p:0.105         Knowing Spiritual Care $79$ $116.6$ $95.00\pm4.32$ $58.1\pm3.00$ t:1.013 p:0.105         Knowing Spiritual Care $79$ $96.2$  | 1 ears of work in the profession   | 112      | 22.5 | 04 60 14 65                      | 59 09 12 60                  |
| 10-10 years17053.094.134+0.2 $02.43\pm3.23$ 11-15 years11524.1 $96.07\pm4.79$ $61.50\pm3.00$ 16 years and up1016.8 $96.00\pm3.20$ $65.32\pm3.04$ Test value $p$ 1016.8 $96.00\pm3.20$ $65.32\pm3.04$ Gaining knowledge about the concept of<br>artificial intelligence198 $41.5$ $91.55\pm4.20$ $62.83\pm2.06$ No27958.5 $99.16\pm4.10$ $63.79\pm3.17$ Test value $p$ 161 $33.8$ $90.87\pm4.16$ $63.57\pm3.46$ No316 $66.2$ $100.38\pm4.83$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No $366$ $76.7$ $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No $366$ $76.7$ $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 116.6 $95.00\pm4.32$ $58.14\pm3.00$ Ves $79$ $16.6$ $95.00\pm4.32$ $58.14\pm3.00$ Ves $79$ $16.6$ $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ $79$ $16.6$ $95.00\pm4.30$ $57.66\pm3.88$ No $79$ $16.6$ $96.20\pm4.30$ $57.66\pm3.88$ </td <td>6 10 years</td> <td>112</td> <td>25.5</td> <td><math>94.00\pm4.03</math><br/>04.12±4.02</td> <td><math>58.08\pm 3.09</math></td>   | 6 10 years   | 112      | 25.5 | $94.00\pm4.03$<br>04.12±4.02     | $58.08\pm 3.09$              |
| 11-15 years       115       24.1 $90.0744.79$ $01.30\pm 3.00$ 16 years and up       80       16.8 $96.00\pm 3.20$ $65.32\pm 3.04$ Test value $p$ 198       16.8 $96.00\pm 3.20$ $65.32\pm 3.04$ Gaining knowledge about the concept of artificial intelligence       198 $41.5$ $91.55\pm 4.20$ $62.83\pm 2.06$ No       279       58.5 $99.16\pm 4.10$ $63.79\pm 3.17$ $t1.720 \text{ p.}0.030^*$ $t0.490 \text{ p.}0.062$ To have knowledge about the use of artificial intelligence in health       161 $33.8$ $90.87\pm 4.16$ $63.57\pm 3.46$ No       316 $66.2$ $100.38\pm 4.83$ $63.66\pm 3.23$ $t1.920 \text{ p.}0.017^*$ $t1.013 \text{ p.}0.105$ Using an application that uses artificial intelligence       111 $23.3$ $95.91\pm 3.97$ $63.57\pm 3.46$ No       366       76.7 $96.22\pm 4.10$ $63.66\pm 3.23$ $t1.013 \text{ p.}0.105$ Wes       386       83.4 $95.34\pm 4.06$ $68.05\pm 3.01$ $t1.598 \text{ p.}0.300$ $t1.013 \text{ p.}0.105$ No       Test value $p$ 79 $16.6$ $95.00\pm 4.32$ $58.14\pm 3.00$ $t1.013 \text{ p.}0.105$ <   | 0-10 years   | 1/0      | 33.0 | $94.15 \pm 4.02$                 | $02.43\pm 3.23$              |
| 16 years and up8016.896.00 $\pm 3.20$ 63.32 $\pm 3.04$ Test value $p$ F:2.016 0.077F:1.700 0.015*Gaining knowledge about the concept of<br>artificial intelligence19841.591.55 $\pm 4.20$ 62.83 $\pm 2.06$ No27958.599.16 $\pm 4.10$ 63.79 $\pm 3.17$ Test value $p$ t:1.720 p:0.030*t:0.490 p:0.062To have knowledge about the use of artificial<br>intelligence in health16133.890.87 $\pm 4.16$ 63.57 $\pm 3.46$ No31666.2100.38 $\pm 4.83$ 63.66 $\pm 3.23$ t:1.013 p:0.105Using an application that uses artificial<br>intelligence11123.395.91 $\pm 3.97$ 63.57 $\pm 3.46$ No36676.796.22 $\pm 4.10$ 63.66 $\pm 3.23$ t:1.013 p:0.105Knowing Spiritual Care<br>   | 11-15 years  | 115      | 24.1 | $96.07\pm4.79$                   | $01.30\pm 3.00$              |
| Test value $p$ 19841.591.55 $\pm$ 4.2062.83 $\pm$ 2.06Gaining knowledge about the concept of<br>artificial intelligence19841.591.55 $\pm$ 4.2062.83 $\pm$ 2.06No27958.599.16 $\pm$ 4.1063.79 $\pm$ 3.17Test value $p$ 16133.890.87 $\pm$ 4.1663.57 $\pm$ 3.46No31666.2100.38 $\pm$ 4.8363.66 $\pm$ 3.23Test value $p$ 16133.890.87 $\pm$ 4.1663.57 $\pm$ 3.46No31666.2100.38 $\pm$ 4.8363.66 $\pm$ 3.23Test value $p$ 11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value $p$ 11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value $p$ 11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value $p$ 116.639.883.495.34 $\pm$ 4.0668.05 $\pm$ 3.01Test value $p$ 7916.695.00 $\pm$ 4.3258.14 $\pm$ 3.00Ves16.634.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365.696.20 $\pm$ 4.3057.66 $\pm$ 3.88Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365.696.20 $\pm$ 4.3057.66 $\pm$ 3.88Test value $p$ 10431.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365.696.20 $\pm$ 4.3057.66 $\pm$ 3.88   | To years and up  | 80       | 10.8 | $96.00\pm 3.20$<br>E:2.016.0.077 | 03.32±3.04<br>E:1 700 0 015* |
| Gamma knowledge about the Concept of<br>artificial intelligence<br>Yes198<br>27941.5<br>58.591.55 $\pm$ 4.20<br>99.16 $\pm$ 4.10<br>t:1.720<br>   | $\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2}          |      | F.2.010 0.077                    | F.1.700 0.015                |
| a initial intelligence19841.591.55 $\pm$ 4.2062.83 $\pm$ 2.06No27958.599.16 $\pm$ 4.1063.79 $\pm$ 3.17Test value $p$ 10111.720p:0.030*t:0.490To have knowledge about the use of artificial<br>intelligence in health16133.890.87 $\pm$ 4.1663.57 $\pm$ 3.46No31666.2100.38 $\pm$ 4.8363.66 $\pm$ 3.2311.013p:0.105Using an application that uses artificial<br>intelligence11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.231.013p:0.105Knowing Spiritual Care<br>Yes39883.495.34 $\pm$ 4.0668.05 $\pm$ 3.01No7916.695.00 $\pm$ 4.3258.14 $\pm$ 3.001.0905Getting Education for Spiritual Care<br>Yes16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365696.20 $\pm$ 4.3057.66 $\pm$ 3.88Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365696.20 $\pm$ 4.3057.66 $\pm$ 3.88Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63Test value $p$ 16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63 <td>artificial intelligence</td> <td></td> <td></td> <td></td> <td></td>  | artificial intelligence  |          |      |                                  |                              |
| 133<br>No<br>Test value $p$ 136<br>27941.3<br>58.591.1524.10<br>99.164.10<br>t:1.720 p.0.030*02.0522.00<br>63.79±3.17<br>t:0.490 p:0.062To have knowledge about the use of artificial<br>intelligence in health<br>Yes161<br>33.833.8<br>90.87±4.1699.164.10<br>63.57±3.46No<br>No<br>Yes161<br>31633.8<br>66.290.87±4.16<br>100.38±4.8363.66±3.23<br>t:1.013 p:0.105Using an application that uses artificial<br>intelligence<br>Yes111<br>36623.3<br>76.795.91±3.97<br>96.22±4.10<br>t:1.598 p:0.30063.57±3.46<br>t:1.013 p:0.105Knowing Spiritual Care<br>Yes<br>No<br>Test value $p$ 398<br>7983.4<br>16.695.34±4.06<br>95.00±4.32<br>t:1.654 p:0.08668.05±3.01<br>t:0.905 p:0.040*Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 398<br>16434.4<br>34.494.04±4.14<br>94.04±4.1469.49±3.63<br>57.66±3.88<br>t:1.068 p:0.07069.49±3.63<br>t:0.085 p:0.021*  |  | 198      | 41.5 | 91 55+4 20                       | 62 83+2 06                   |
| Tot value $p$ 21.730.597.102.11003.792.17Test value $p$ t:1.720 p:0.030*t:0.490 p:0.062To have knowledge about the use of artificial<br>intelligence in healtht:1.720 p:0.030*t:0.490 p:0.062Yes16133.890.87±4.1663.57±3.46No31666.2100.38±4.8363.66±3.23Test value $p$ 11123.395.91±3.9763.57±3.46Using an application that uses artificial<br>intelligence11123.395.91±3.9763.57±3.46Yes11123.395.91±3.9763.57±3.46No36676.796.22±4.1063.66±3.23Test value $p$ 11123.395.34±4.0668.05±3.01No36676.796.32±4.1063.66±3.23Test value $p$ 16.695.34±4.0668.05±3.01Knowing Spiritual Care<br>Yes39883.495.34±4.0668.05±3.01No39839883.495.00±4.3258.14±3.00Cetting Education for Spiritual Care<br>Yes16434.494.04±4.1469.49±3.63No31365.696.20±4.3057.66±3.88Test value $p$ 16434.494.04±4.1469.49±3.63Yes16434.494.04±4.1469.49±3.63Test value $p$ 16431.365.696.20±4.3057.66±3.88   | No   | 279      | 58.5 | 99 16+4 10                       | 63.79+3.17                   |
| To have knowledge about the use of artificial<br>intelligence in health<br>Yes16133.890.87 $\pm$ 4.1663.57 $\pm$ 3.46No31666.2100.38 $\pm$ 4.8363.66 $\pm$ 3.23Test value p11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46Ves11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value p11123.395.91 $\pm$ 3.9763.66 $\pm$ 3.23Ves11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value p11639883.495.34 $\pm$ 4.0668.05 $\pm$ 3.01Knowing Spiritual Care<br>Yes39883.495.34 $\pm$ 4.0668.05 $\pm$ 3.01Test value p7916.695.00 $\pm$ 4.3258.14 $\pm$ 3.00Cetting Education for Spiritual Care<br>Yes16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365.696.20 $\pm$ 4.3057.66 $\pm$ 3.88Test value p16431.494.04 $\pm$ 1.1469.49 $\pm$ 3.63   | Test value n   | 21)      | 50.5 | t·1 720 p· <b>0 030</b> *        | t:0.490  n:0.062             |
| Intelligence in health<br>Yes16133.890.87 $\pm$ 4.1663.57 $\pm$ 3.46No31666.2100.38 $\pm$ 4.8363.66 $\pm$ 3.23Test value p10123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46Using an application that uses artificial<br>intelligence11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46Yes11123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value p10111123.395.91 $\pm$ 3.9763.57 $\pm$ 3.46No36676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Test value p16676.796.22 $\pm$ 4.1063.66 $\pm$ 3.23Knowing Spiritual Care<br>Yes16.695.04 $\pm$ 3.20t:1.013 p:0.105Knowing Education for Spiritual Care<br>Yes16.695.00 $\pm$ 4.3258.14 $\pm$ 3.00Test value p16434.494.04 $\pm$ 4.1469.49 $\pm$ 3.63No31365.696.20 $\pm$ 4.3057.66 $\pm$ 3.88Test value p16431.494.02 $\pm$ 4.1010.256 p:0.021 $\pm$  | To have knowledge about the use of artificial  |          |      | 0.11.720 p.01020                 | 1.0.190 p.0.002              |
| Yes16133.890.87±4.16 $63.57\pm3.46$ No316 $66.2$ $100.38\pm4.83$ $63.66\pm3.23$ Test value $p$ $11.920 \text{ p:} 0.017^*$ $t1.013 \text{ p:} 0.105$ Using an application that uses artificial<br>intelligenceYes111 $23.3$ $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ $t1.598 \text{ p:} 0.300$ $t1.013 \text{ p:} 0.105$ Knowing Spiritual Care<br>YesYes398 $83.4$ $95.34\pm4.06$ $68.05\pm3.01$ No398 $79$ $16.6$ $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ $t1.654 \text{ p:} 0.086$ $t0.905 \text{ p:} 0.040^*$ Getting Education for Spiritual Care<br>YesYes164 $34.4$ $94.04\pm4.14$ $69.49\pm3.63$ No313 $65.6$ $96.20\pm4.30$ $57.66\pm3.88$ Test value $p$ 164 $31.4$ $94.04\pm4.14$ $69.49\pm3.63$  | intelligence in health   |          |      |                                  |                              |
| No<br>Test value $p$ 31666.2100.38±4.83<br>t:1.920 p:0.017*63.66±3.23<br>t:1.013 p:0.105Using an application that uses artificial<br>intelligence11123.395.91±3.97<br>96.22±4.1063.66±3.23<br>t:1.013 p:0.105Yes<br>No<br>Test value $p$ 11123.395.91±3.97<br>96.22±4.1063.66±3.23<br>t:1.598 p:0.300t:1.013 p:0.105Knowing Spiritual Care<br>Yes<br>No<br>Test value $p$ 398<br>7983.4<br>16.695.34±4.06<br>95.00±4.32<br>t:1.654 p:0.08668.05±3.01<br>t:0.905 p:0.040*Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 164<br>31334.4<br>65.694.04±4.14<br>94.04±4.1469.49±3.63<br>57.66±3.88  | Yes  | 161      | 33.8 | 90.87±4.16                       | 63.57±3.46                   |
| Test value $p$ Image: constraint of the second symbolsImage: constraint of the second symbolst:1.020 p:0.017*t:1.013 p:0.105Using an application that uses artificial intelligenceImage: constraint of the second symbolsImage: constraint of the second symbolsImage: constraint of the second symbolsImage: constraint of the second symbolsImage: constraint of the second symbolsYes11123.395.91±3.9763.57±3.46No36676.796.22±4.1063.66±3.23Test value $p$ 11123.895.34±4.0668.05±3.01No39839883.495.34±4.0668.05±3.01Test value $p$ 7916.695.00±4.3258.14±3.00Cetting Education for Spiritual Care16434.494.04±4.1469.49±3.63Yes16431365.696.20±4.3057.66±3.88Test value $p$ 16431365.696.20±4.3057.66±3.88  | No   | 316      | 66.2 | $100.38 \pm 4.83$                | 63.66±3.23                   |
| Using an application that uses artificial<br>intelligence11123.3 $95.91\pm3.97$ $63.57\pm3.46$ Yes11123.3 $96.22\pm4.10$ $63.66\pm3.23$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 11123.3 $95.91\pm3.97$ $63.57\pm3.46$ Knowing Spiritual Care<br>Yes398 $83.4$ $95.34\pm4.06$ $68.05\pm3.01$ Test value $p$ 7916.6 $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ 7916.6 $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ 7916.6 $96.20\pm4.30$ $t:0.905$ Getting Education for Spiritual Care<br>Yes164 $34.4$ $94.04\pm4.14$ $69.49\pm3.63$ No313 $65.6$ $96.20\pm4.30$ $57.66\pm3.88$ Test value $p$ 1164 $31.4$ $94.04\pm4.14$ $69.49\pm3.63$   | Test value p   |          |      | t:1.920 p: <b>0.017*</b>         | t:1.013 p:0.105              |
| intelligence11123.3 $95.91\pm3.97$ $63.57\pm3.46$ Yes36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ 1111.598 p:0.300 $t:1.013 p:0.105$ Knowing Spiritual Care39883.4 $95.34\pm4.06$ $68.05\pm3.01$ Yes3987916.6 $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ 7916.6 $95.00\pm4.32$ $58.14\pm3.00$ Cetting Education for Spiritual Care164 $34.4$ $94.04\pm4.14$ $69.49\pm3.63$ Yes164 $31.3$ $65.6$ $96.20\pm4.30$ $57.66\pm3.88$ Test value $p$ 164 $51.6$ $96.20\pm4.30$ $57.66\pm3.88$   | Using an application that uses artificial  |          |      |                                  | •                            |
| Yes11123.3 $95.91\pm3.97$ $63.57\pm3.46$ No36676.7 $96.22\pm4.10$ $63.66\pm3.23$ Test value $p$ $t1.598 p:0.300$ $t:1.013 p:0.105$ Knowing Spiritual Care398 $83.4$ $95.34\pm4.06$ $68.05\pm3.01$ Yes $79$ $16.6$ $95.00\pm4.32$ $58.14\pm3.00$ Test value $p$ $79$ $16.6$ $95.00\pm4.32$ $58.14\pm3.00$ Cetting Education for Spiritual Care $164$ $34.4$ $94.04\pm4.14$ $69.49\pm3.63$ No $313$ $65.6$ $96.20\pm4.30$ $57.66\pm3.88$ Test value $p$ $164$ $31.4$ $94.04\pm4.14$ $69.49\pm3.63$ State $p$ $164$ $16.6$ $96.20\pm4.30$ $57.66\pm3.88$   | intelligence   |          |      |                                  |                              |
| No<br>Test value $p$ 36676.796.22±4.10<br>t:1.598 p:0.30063.66±3.23<br>t:1.013 p:0.105Knowing Spiritual Care<br>No<br>Test value $p$ 398<br>7983.4<br>16.695.34±4.06<br>95.00±4.32<br>t:1.654 p:0.08668.05±3.01<br>58.14±3.00<br>t:0.905 p:0.040*Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 164<br>31334.4<br>65.694.04±4.14<br>96.20±4.30<br>t:1.068 p:0.07069.49±3.63<br>t:0.256 p:0.021*  | Yes  | 111      | 23.3 | 95.91±3.97                       | 63.57±3.46                   |
| Test value $p$ Image: constraint of the systemtext (1.598 p: 0.300)text (1.013 p: 0.105)Knowing Spiritual Care<br>Yes<br>No<br>Test value $p$ 398<br>7983.4<br>16.695.34±4.06<br>95.00±4.32<br>text (1.654 p: 0.086)68.05±3.01<br>58.14±3.00<br>text (0.905 p: 0.040*)Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 164<br>31334.4<br>65.694.04±4.14<br>94.04±4.1469.49±3.63<br>57.66±3.88<br>tr 1.068 p: 0.070Test value $p$ 164<br>text (0.905 p: 0.040*)164<br>text (0.905 p: 0.040*)164<br>text (0.905 p: 0.040*)   | No   | 366      | 76.7 | 96.22±4.10                       | 63.66±3.23                   |
| Knowing Spiritual Care<br>Yes<br>No<br>Test value $p$ 398<br>39883.4<br>7995.34 $\pm$ 4.06<br>95.00 $\pm$ 4.32<br>t:1.654 p:0.08668.05 $\pm$ 3.01<br>58.14 $\pm$ 3.00<br>t:0.905 p:0.040*Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 164<br>31334.4<br>65.694.04 $\pm$ 4.14<br>96.20 $\pm$ 4.30<br>57.66 $\pm$ 3.88<br>t:1.068 p:0.07069.49 $\pm$ 3.63<br>57.66 $\pm$ 3.88<br>t:0.256 p:0.021*  | Test value p   |          |      | t:1.598 p:0.300                  | t:1.013 p:0.105              |
| Yes<br>No<br>Test value $p$ 398<br>7983.4<br>16.695.34 $\pm$ 4.06<br>95.00 $\pm$ 4.32<br>t:1.654 p:0.08668.05 $\pm$ 3.01<br>58.14 $\pm$ 3.00<br>t:0.905 p: <b>0.040*</b> Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 164<br>31.334.4<br>65.694.04 $\pm$ 4.14<br>96.20 $\pm$ 4.30<br>57.66 $\pm$ 3.88<br>t:1.068 p:0.07069.49 $\pm$ 3.63<br>57.66 $\pm$ 3.88<br>t:0.256 p: <b>0.021*</b>   | Knowing Spiritual Care   |          |      |                                  |                              |
| No<br>Test value $p$ 398<br>7983.4<br>16.695.34±4.06<br>95.00±4.32<br>t:1.654 p:0.08668.05±3.01<br>58.14±3.00<br>t:0.905 p:0.040*Getting Education for Spiritual Care<br>Yes<br>No<br>Test value $p$ 164<br>31334.4<br>65.694.04±4.14<br>96.20±4.30<br>t:1.068 p:0.07069.49±3.63<br>57.66±3.88<br>t:0.256 p:0.021*  | Yes  |          |      |                                  |                              |
| Test value $p$ 7916.695.00±4.32<br>t:1.654 p:0.08658.14±3.00<br>t:0.905 p:0.040*Getting Education for Spiritual Care<br>Yes16434.494.04±4.1469.49±3.63No31365.696.20±4.3057.66±3.88Test value $p$ t:1.068 p:0.070t:0.256 p:0.021*   | No   | 398      | 83.4 | 95.34±4.06                       | 68.05±3.01                   |
| Getting Education for Spiritual Care         t:1.654         p:0.086         t:0.905         p:0.040*           Yes         164         34.4         94.04±4.14         69.49±3.63           No         313         65.6         96.20±4.30         57.66±3.88           Test value         n         t:0.256         p:0.021*  | Test value p   | 79       | 16.6 | 95.00±4.32                       | 58.14±3.00                   |
| Getting Education for Spiritual Care         164         34.4         94.04±4.14         69.49±3.63           No         313         65.6         96.20±4.30         57.66±3.88           Test value         n         t1068 p:0.070         t:0.256 p:0.021*   |  |          |      | t:1.654 p:0.086                  | t:0.905 p: <b>0.040*</b>     |
| Yes164 $34.4$ $94.04\pm4.14$ $69.49\pm3.63$ No313 $65.6$ $96.20\pm4.30$ $57.66\pm3.88$ Test value $n$ $t \cdot 1 \ 068 \ p \cdot 0 \ 070$ $t \cdot 0 \ 256 \ p \cdot 0 \ 021*$  | Getting Education for Spiritual Care   |          |      |                                  |                              |
| No       313       65.6       96.20 $\pm$ 4.30       57.66 $\pm$ 3.88         transform       transform       transform       transform       0.21*   | Yes  | 164      | 34.4 | 94.04±4.14                       | 69.49±3.63                   |
| Test value $p$ tri 068 pri 070 tri 0.256 pri 0.021*   | No   | 313      | 65.6 | 96.20±4.30                       | 57.66±3.88                   |
|   | Test value p   |          |      | t:1.068 p:0.070                  | t:0.256 p: <b>0.021</b> *    |

\*p<0.05 AIAS: Artificial Intelligence Anxiety Scale, SSCRS: Spirituality and Spiritual Care Rating Scale

#### **Table 2.** AIAS and SSCRS mean scores (n=477)

| Scales                                      | Mean             | Min-Max |
|---|------------------|---------|
| AIAS Total                                  | 95.35±4.02       | 21-147  |
| AIAS -Learning                              | 39.17±4.00       | 8-56    |
| AIAS -Job Replacement                       | $27.00 \pm 3.46$ | 6-42    |
| AIAS -Sociotechnical Blindness              | $16.92 \pm 4.18$ | 4-28    |
| AIAS -Artificial Intelligence Configuration | $13.48 \pm 4.35$ | 3-21    |
| SSCRS Total                                 | 63.50±3.14       | 17-85   |

AIAS: Artificial Intelligence Anxiety Scale, SSCRS: Spirituality and Spiritual Care Rating Scale, Min: Minimum, Max: Maximum.

| Table 3. Correlation between nurses | AIAS total and sub-dimension scores and SSCRS ( | (n=477) |
|-------------------------------------|---|---------|
|-------------------------------------|---|---------|

| Scales                                      |   | SSCRS  |
|---|---|--------|
| AIAS Total                                  | r | -0.785 |
|   | р | 0.041* |
| AIAS -Learning                              | r | 0.006  |
|   | р | 0.982  |
| AIAS -Job Replacement                       | r | 0.224  |
|   | р | 0.763  |
| AIAS -Sociotechnical Blindness              | r | 0.195  |
|   | р | 0.060  |
| AIAS -Artificial Intelligence Configuration | r | 0.012  |
|   | р | 0.259  |

Pearson correlation analysis \*p < 0.05; AIAS: Artificial Intelligence Anxiety Scale, SSCRS Spirituality and Spiritual Care Rating Scale

| Table 4. Linear Regression | Analysis of the effect of AIAS on SSCRS ( | (n=477) |
|----------------------------|---|---------|
|                            |   | ()      |

| Variable | В       | S.E. | β       | t    | р   |
|----------|---------|------|---------|------|-----|
| Constant | 62.78   | .25  |         | 3.00 | .00 |
| AIAS     | - 0.221 | .15  | - 0.018 | 2.19 | .03 |

 $F = 36.140, p < .05; R = .840, R^2 = .705;$  AIAS: Artificial Intelligence Anxiety Scale

#### DISCUSSION

Artificial intelligence makes it easier for nurses to support clinical decision-making in complex care practices or to conduct remote tasks that require one-to-one interaction with patients, such as documentation processes (4, 8). However, the idea that artificial intelligence robots will replace nurses in the future will cause the problems of meeting physical and spiritual care needs of patients together (17, 18). Based on this idea, the results of our study were discussed in the light of the literature. Internal medicine nurses had moderate anxiety about the use of AI in the field of health. This may be because they do not have sufficient knowledge about AI applications and have not encountered such a technology yet. Although health professionals generally agree on the benefits of using AI in the field of health, most healthcare professionals do not fully understand the principles of AI and are concerned about the possible consequences of its widespread use in clinical practices (23, 24). They concern about privacy and inability of AI robots to meet patients' spiritual care needs (23, 25). Our study found a significant difference between the nurses' AIAS mean scores according to their knowledge about artificial intelligence and its usage in health. Those who did not have knowledge about AI and its usage in health had higher AIAS. Studies have reported that knowing about AI and its use reduces anxiety about AI (4, 25). Experts using AI technology should explain this technology to nurses to relieve their anxiety and confusion on this issue. In addition, nurses should make an individual effort to reach accurate and reliable information about AI (26, 27).

As the lowest and highest scores on SSCRS are 17 and 85, the nurses' perceived spiritual support was found to be high in this study. The nurses' perceived spiritual support mean score was found as 52.48±6.51 by Timmins and Caldeira (28), 44.151±10.83 by Veloza-Gómez et al., and 47.70±9.95 by Riahi et al., suggesting that they had high perceived spiritual care (29, 30). Perceived spiritual support is important for patients to recover from their illness or to accept their illness. Employees with high perceived spirituality will provide spiritual support to patients and contribute to their treatment processes through a more hopeful perspective (31, 32). These will also have positive effects on the job satisfaction of health service providers and the effectiveness and efficiency of health institutions.

The present study determined significantly higher perceived spiritual care in female nurses. As female nurses constitute the majority of nursing profession and are more sensitive in approaching patients emotionally, this may have played an active role in the emergence of this difference. Compared to male nurses, female nurses have more emotional sensitivities and better ability to share their feelings with patients, have higher sense of compassion, and are more sensitive to the needs of others (47). Female nurses also have high spiritual care sensitivity (48, 49). Our study found higher perceived spirituality and spiritual care in nurses who had a working experience of 16 years or above, suggesting that a longer

professional experience in clinics affects nurses' perceived spiritual care positively.

Studies reported that nurses who did not know about spirituality and spiritual care had lower SSCRS mean scores (8, 9), and that nurses who received training on spiritual care practice spiritual care more frequently (13, 14). According to the results of our study, the nurses who did not know about spiritual care and those who did not receive training on this subject was found to have lower SSCRS mean scores. These results show that training for both nursing students and nurses about spirituality and spiritual care increases their knowledge, perception and practices about the subject (15, 16). Considering the results of our study and those in the literature; the most important reason for the unmet spiritual care needs of patients is the nurses' lack of knowledge about spirituality and spiritual care (16, 22)

There was an elevated level of negative correlation between the AIAS and the SSCRS, and the nurses' AIAS significantly affected their perceived spiritual care scores. Those with high AI anxiety had lower perceived spiritual care. These results suggest that nurses consider the use of AI in health insufficient in terms of meeting spiritual care needs of patients. Studies have emphasized that the majority of nurses agree that AI robots will not be able to meet moral and emotional needs of patients because they will not have feelings such as love and compassion (12, 34). Nurses believe that meeting spiritual care needs of patients, one of the important duties of nurses, cannot be fulfilled by AI health robots.

## CONCLUSION

Internal medicine nurses obtained moderate AIAS mean score and high SSCRS mean score. As their AIAS mean score increased, their SSCRS mean score decreased. Therefore, it is important to increase the awareness of nurses on AI technologies through trainings, examine their attitudes towards artificial intelligence, and create harmonization strategies between nurses and AI applications. It is necessary to develop holistic and transparent AI systems that can solve spiritual care problems, eliminate related risks in health and have spiritual care sensitivity. In addition, further comprehensive and qualitative studies should be conducted to understand nurses' concerns about AI.

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The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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