Effect of Training Program About COVID-19 on Staff Nurses' Resilience

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Abstract

Background: Universally, nurses are a major force in the fight against COVID-19 which may have been reflected in nurses' resilience affects the quality and safety of the care for patients afflicted with the virus. Aim: This study aimed to the effect of training program About COVID-19 on staff nurses' resilience. Design: A quasi-experimental one-group pretest-post-test design was conducted in this study. Setting: Banha University Hospital. Subjects: A simple random sample of 150 staff nurses. Tools: Data for this study were collected by using two tools, namely: knowledge, attitude, and practice (KAPs) concerning the COVID-19 questionnaire, and the resilience scale for nurses. Results: This study revealed that staff nurses' knowledge, attitude, and infection prevention practice regarding COVID-19 during the post- and follow-up intervention was improved. Also, the staff nurses’ resilience level at the post- and follow-up intervention was increased. Conclusion: There was a positive strong statistically significant correlation between knowledge, attitude, infection prevention practice, and total level of resilience scores post and follow-up training program. Recommendations: Necessary resources should be available to allow nurses to work in a safe environment that may help in increasing resilience level during the fight against COVID-19, and the suggested future study to investigate the effect of COVID-19 on the performance quality of nurses and patient satisfaction.

Keywords: COVID-19, Resilience, Nurses, Training Program

Introduction

Nurses are the first line of contact with patients in healthcare settings; as a result, nurses are expected to be at a high risk of infection. COVID-19 knowledge, attitudes, and performance are vital in shaping a nurse's readiness to adopt change initiatives. It would also be useful to gain a better understanding of the illness to plan preventive methods and health promotion programs (Abd Elaziz, Abd El Hafez, & Sayed 2021). Furthermore, the nurse is an active member in preventing both primary and secondary infectious diseases. In every country, nursing is considered a top priority and professional for disease prevention and pain relief during and after treatment of any disease including COVID-19 (WHO, 2020).

The outbreak of infectious diseases places a heavy responsibility on health care teams and leads to a lack of readiness (Patel et al., 2017). Moreover, Carelessness and lack of knowledge were identified as responsible for the rapid spread of infection in the first days of the pandemic (Zhang, 2020). Furthermore, lack of knowledge among healthcare members can contribute to disease infection and spread. COVID-19 is highly transmissible and causes asymptomatic cases in communities (Ye, 2020). Therefore, an effective response to infectious diseases is hindered by a lack of knowledge about risks and response actions (Daugherty, 2020).

Universally, nurses are a major force in the fight against COVID-19, and their resilience not only affects their mental health but also the quality and safety of the care they provide to patients with COVID-19; therefore, education and work experience were determined as factors that contribute to resilience. Resilience training programs and increased knowledge on how to work in a situation arising from unknown diseases increase the level of resilience and improve nursing care practice (Afshari, Nourollahi-Darabad ,&Chinisaz,2021).

The concept of resilience gradually receives more attention, especially in the health area in question, from nurses. Resilience can be interpreted as the ability to challenge, conquer, emerge strengthen, or adapt to the
experience of adverse situations. This scenario makes the leadership progressively develop the ability to adapt to changes, playing a fundamental role in maintaining mental health, as well as mitigating the negative effects of employee stress and progressively developing them, making them the part key to achieving organizational and personal success (Cai, et al., 2019; Lyu, et al., 2020).

At the peak of the crisis caused by the coronavirus, indicators showed that nurses who had adequate levels of resilience coped better with the impact of the pandemic, resulting in reduced anxiety, post-traumatic stress, emotional exhaustion, and depression, consequently providing safer care. Thus, many hospital institutions have invested in programs and interventions to develop nurses’ resilience in health care (Zhang, 2021).

Significance of the study:

Resilience is the ability to diminish the effects of a stressful event by expectation and preparation, helping health care professionals better recover from trauma, in this case, the COVID-19 pandemic. Providing training can increase resilience scores and help protect nurses’ mental health. Furthermore, managers need to dedicate more time to nurses’ preparation actions, benefiting the worker’s confidence to perform their tasks. Effectively, nursing managers must implement practices that aim to decrease stress and strengthen level of resilience among nurses. They must also create a healthy work environment, improving nurses’ skills and habits of resilience in response to high demand, greater complexity of care, and emotional overload, especially during pandemics (Ou et al., 2021; Jose, Dhandapani & Cyriac, 2020).

A similar study reports that knowledge of infectious disease protocols, continuing education provided by the hospital, skills, and self-regulation during the pandemic were facilitators for increasing resilience and care security among the sample studied (Huang et al., 2021). From this perspective, the researchers are concerned with the increasing resilience of nurses during COVID-19 which in turn has a great impact on direct patient care, nurses’ quality of life, satisfaction, meaning of nurses’ work, and the impact on costs with the turnover of less resilient professionals. Thus, the objective of this study was to evaluate the effect of the COVID-19 training program on resilience among staff nurses.

Aim of the Study

This study aims to evaluate the effect of training program About COVID-19 on staff nurses' resilience through the following:

1. Assessment of knowledge, attitude, and infection prevention practices of staff nurses toward the COVID-19 pre-post and follow-up.
2. Assessment of resilience among staff nurses pre-post and follow-up.
3. Developing and implementing the COVID-19 training program.
4. Evaluating the effect of training program About COVID-19 on resilience among staff nurses.

Research hypothesis:

This study hypothesized that:

1. Implementation of the COVID-19 training program will affect positively on the knowledge of staff nurses.
2. Implementation of the COVID-19 training program will affect positively on the attitude of staff nurses.
3. Implementation of the COVID-19 training program will affect positively on the infection preventive practices reported by staff nurses.
4. Implementation of the COVID-19 training program will positively affect nurses’ resilience.

Subjects & Methods

Research design:

A quasi-experimental one-group pretest-posttest design was conducted in this study.

Setting:

The study was conducted in Benha University Hospital at Al-Kalubia Government with a total bed capacity of 546 beds. The current
study was conducted in 14 inpatient general and specialty medical and surgical departments which included 25 units (15 units for medical departments and 10 units for surgical departments).

Subjects:
The total number of nurses who were working in the above-mentioned study setting during the study was 400 staff nurses. The study sample of 150 staff nurses selected by simple random sampling technique was distributed (100 nurses work in medical departments and 50 nurses work in surgical departments) after the sample size was estimated.

Sample size:
Depending on Daniel (2020) found the improvement and the difference range from 64.2% to 80% in knowledge, attitude, and practice assuming the power=0.95 and α=0.05, and by using PASS 25th release the sample size (150 staff nurses).

Formula
This calculator uses the following formula for the sample size n:

\[ n = \frac{N \times X}{X + N - 1}, \]

where,

\[ X = \frac{Z_\alpha/2}{2} \times p \times (1-p) / \text{MOE}^2, \]

and \( Z_\alpha/2 \) is the critical value of the normal distribution at \( \alpha/2 \) (e.g. for a confidence level of 95%, \( \alpha \) is 0.05 and the critical value is 1.96), MOE is the margin of error, \( p \) is the sample proportion, and \( N \) is the population size. Note that a Finite Population Correction has been applied to the sample size formula.

Tools for data collection:
Data for this study were collected by using two tools, namely: KAPs concerning COVID-19 questionnaire, and resilience scale for nurses:

First tool: knowledge, attitude, and practice (KAPs) concerning COVID-19 questionnaire:
A self-administered structured questionnaire was developed by researchers guided by (World Health Organization,2019) and further modification was carried out to fit the local context and research objective. It was used to collect the knowledge, attitude, and infection prevention practice, towards COVID-19. It consisted of four parts.

The first part: Demographic characteristics of the staff nurses:
It was concerned with collecting data about age, gender, marital status, work units, and attending previous training for COVID-19.

The second part: Staff Nurses’ knowledge concerning COVID-19:
A self-administered questionnaire on staff nurses' knowledge of COVID-19. It was measured using 18 questions as (COVID-19 is a virus infection and COVID-19 vaccine is available in markets) and providing a numerical value for each question—1, Yes (correct); 0, No (incorrect answer).

Scoring system:
The knowledge score for the staff nurses varied between 0 (with no correct answer) and 18 (for all correct answers); a cut-off level of \( \leq 50\% \) (≤9 score), was evaluated as unsatisfactory knowledge. While \( > 50\% \) (>9 scores) indicated satisfactory knowledge (Zhou, et al., 2020).

The third part: Staff Nurses’ attitudes concerning COVID-19:
A self-administered questionnaire for attitude concerning COVID-19 was measured using 11 questions, as (Do you agree that COVID-19 will finally be successfully controlled?)

Scoring system:
Nurse Responses were measured using a five-point Likert scale and by proving numerical value (1, strongly disagree; 2, disagree; 3, neutral; 4, agree and 5, strongly agree). A mean score >33 (answering strongly agree or agree) was described as a positive attitude, and a score of 11 to 33 indicated a negative attitude (answering strongly disagree, disagree, or neutral). The total attitude was negative if obtained at (<60%), while the attitude was positive if obtained at (≥60%) (Giao, 2020).

The fourth part: Infection prevention practice concerning COVID-19:

A self-administered questionnaire for infection prevention practices concerning COVID-19 was measured by 14 questions as (Do you always remove protective equipment carefully? Do you cover your mouth when coughing and sneezing in the past 14 days?).

Scoring system:

Nurse Responses were measured on a 5-5-point Likert scale by proving numerical value (1, never; 2, occasionally; 3, sometimes; 4, most of the time; 5, always). A mean score >42 (answering for always or most of the time or sometimes) was carried out as having good practice, and a score of 42 indicated poor practice (answering never or occasionally). The total poor practice was obtained at (<60%), while the total good practice was obtained at (≥60%) (Zhou et al., 2020).

The second tool: Resilience Scale for Nurses:

This scale was developed by (Park & Park, 2016) and was modified by the researchers. It aimed to assess resilience levels among staff nurses. It contains 19 items classified into four dimensions as follows: Dispositional Pattern (6 items) as (I can do a new job or a difficult work), relational Pattern (4 items) as (I fully accept the advice of others), situational pattern (3 items) as (I know when I am not involved in the work or I am involved), philosophical pattern (6 items) as (I feel generally happy).

Validit y and reliability:

Validity:

This tool of staff nurses KAPs concerning COVID-19 was reviewed by a panel of 5 experts (2 professors in nursing administration at Ain Shams University, 2 professors in nursing administration at Banha University, and 1 professor in the medical surgical nursing department, at Ain Shams University) to evaluate its face and content validity. The experts reviewed the tool for its content, clarity, simplicity, relevance, comprehensiveness, appropriateness, and applicability. Minor adjustments were made based on the experts’ valued comments as modifying some phrases to give the most appropriate meaning for the statement and then the final forms of the tools were established.

Reliability:

Testing the reliability of the purposed data collecting tools was done by Cronbach’s Alpha Coefficient test, which was 0.82 for the knowledge, 0.93 for the practice tool, and 0.86 for the attitude, and the Resilience scale for nurses 0.851, these scores indicating a high degree of internal consistency.

Pilot study:

It was conducted before performing the main study in April 2021. A pilot study was carried out on 10% of the total number of study subjects (15 staff nurses) to test the applicability of the study and to test the clarity of the designed tools, as well as to estimate the
Data Collection Procedure:
The data collection period phases of the research study were 6 months from the beginning of May 2021 to the end of October 2021. The COVID-19 training program passed into four phases: the Preparatory phase, the implementation phase, and the evaluation and follow-up phase:

Preparatory phase:
This phase started from May 2021 to June 2021. This phase involved extensive reviewing of the recent related literature to develop tools for data collection. The aim and objective of the study were explained by the researchers to the study subjects before data collection, as well as their written approval to participate in the study, was obtained. The questionnaires were distributed to the nurses to complete it by themselves in the presence of the researchers to assess nurses’ knowledge, infection prevention practice, and attitude regarding COVID-19 to identify the nurses’ learning needs. It took 30-45 minutes to fill out these questionnaires. The researchers developed the COVID-19 training program in the Arabic language. Study questionnaires were administered at three different times; the first time was administered before the intervention, the second time was done immediately after the intervention to evaluate the effectiveness of the training program, and the third time was administrated three months after the training (follow-up). The contents of the COVID–19 training program included theoretical information and infection prevention practice, related to COVID-19, and resilience for nurses. The COVID–19 training program was revised for content validity by a group of five expert professors in the nursing administration department faculty of nursing -at Banha University and the final modifications were done based on their opinions.

Implementation phase:
The Implementation lasted for three months, from the first of June 2021 to the beginning of August 2021. The training program was applied to 150 staff nurses and was divided into five groups to be effective, and each group included 30 staff nurses. The training program was implemented in 6 sessions for each group and two hours for each session and each session was conducted weekly. The total (12 hours) for each group. Teaching methods used in the intervention were lectures, group discussion, brainstorming, and scenario-based situations. Teaching aids were videos, PowerPoint, and soft handouts. The training program contents conducted in five sessions for each group as follows:

Program sessions:
In the first session, greet the staff nurses then provide a handout showing the intervention objectives and fill pretest (study questionnaires). The second session: give theoretical information related to the overview and COVID-19 WHO guidelines and carry out group discussion with staff nurses. The third session: give theoretical information related to the COVID-19 pandemic isolation and complications of cases in Egypt and all over the world with videos. The fourth session: give theoretical and practical information related to COVID-19 waste management and infection control show scenario-based situations and carry out brainstorming to solve problems associated with the COVID-19 pandemic. The fifth session covers staff nurses' response to dealing with patients infected with Coronavirus and emotional reactions toward this critical period of their lives and how to cope effectively with it. At the end of each session fill post-test (study questionnaires).

Evaluation and follow-up phase:
Post-implementation of the training program sessions, using the same data collection tools were filled in again immediately (post-training) and at the end of the three months post-intervention (follow-up) in October 2021. Evaluation of the effect of the training program was done by comparing the results of staff nurses’ knowledge, attitude, and infection prevention practice as well as resilience pre-, post, and follow-up.

**Ethical consideration:**

The research ethical approval was obtained from the faculty of nursing - Banha University research ethics committee before initiating the study. The researchers clarified the purpose and aim of the study to nurses included in the study. Written consent was obtained from nurses to ensure willingness to engage in the study. The researchers maintained the anonymity and confidentiality of the subjects’ data. Staff nurses were informed that they were allowed to withdraw from the study at any time without penalty.

**Statistical analysis:**

Data entry and statistical analysis were done using the SPSS 25.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the scale through its internal consistency. Quantitative continuous data were compared using the non-parametric Kruskal Wallis Test. Qualitative categorical variables were compared using the chi-square test. Spearman rank correlation was used for the assessment of the inter-relationships between quantitative variables and ranked ones. To identify the independent predictors of leadership perception score, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05 and highly statistically significant at p<0.01

**Results:**

**Table 1:** shows the distribution and percentage of the studied staff nurses according to their demographic characteristics. As indicated in the table, slightly more than half of them 53.8% age less than 30 years old with Mean± SD (37.45±9.93), and 56% of them were married. While only 6.6% aged more than 40 years. And slightly less than two-thirds 62.8% of them were female. So, 62% of them had experienced years less than 15 years with mean ±SD (14.38 ±9.61).

**Figure 1** describes the distribution of nurses in the study sample by work units. It represents slightly less than one-third of studied nurses 32% work in emergency units and 31% work in critical care units.

**Figure 2** describes the distribution of nurses in the study sample by attending COVID-19 training courses. It represents most of the studied nurses 86.5% not attended COVID-19 training courses. While only 13.5% of them attended training courses.

**Table 2** illustrates that there was a highly statistically significant improvement in studied staff nurses’ satisfactory knowledge regarding covid-19 with 90% at the follow-up phase p<0.01 as compared to 84.1% at the post-intervention phase, and 64.7% at the pre-intervention phase.

**Table 3** Table (3) shows that there was a highly statistically significant improvement in studied staff nurses’ good infection prevention Practice regarding COVID-19 with 88.9% at the post and the follow-up phases p<0.01 as compared to the pre-intervention phase with 51.7%.

**Table 4** shows that there was a highly statistically significant improvement in studied staff nurses' positive attitude towards COVID-19 in the post phase with 91.1% of them and the follow-up phase with 90% of them p<0.01 as compared to the pre-intervention phase 57.8%.

**Table 5** reveals that less than three-quarters (71.2%) of staff nurses had a low level regarding philosophical pattern
dimension. While slightly less than half (51.4%) of them had a low level regarding situational pattern dimension.

Figure 3 Demonstrates the total resilience level among studied staff nurses pre-program (61%) of staff nurses had a low level of resilience. While (18%) of them had a high level of resilience and 21% of staff nurses had a moderate level.

Table 6 compares the resilience dimensions of studied staff nurses throughout the intervention phases. It shows that the post-phase and follow phases demonstrated statistically significant improvement in all dimensions of resilience and total resilience among studied staff nurses.

Table 7 shows that there was a positive strong statistically significant correlation between knowledge, attitude, infection prevention practice, and total resilience scores.

Table 1: Percentage distribution of demographic characteristics of studied staff nurses (N=150)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>81</td>
<td>53.8</td>
</tr>
<tr>
<td>30≥40</td>
<td>59</td>
<td>39.6</td>
</tr>
<tr>
<td>&lt;40</td>
<td>10</td>
<td>6.6</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>37.45±9.93</td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>94</td>
<td>62.8</td>
</tr>
<tr>
<td>Male</td>
<td>56</td>
<td>37.2</td>
</tr>
<tr>
<td>Nursing qualification:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing Diploma</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>Technical Institute of nursing</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Bachelor of nursing</td>
<td>55</td>
<td>37</td>
</tr>
<tr>
<td>Marital Status:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>84</td>
<td>56</td>
</tr>
<tr>
<td>Unmarried</td>
<td>66</td>
<td>44</td>
</tr>
<tr>
<td>Experience years in nursing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15</td>
<td>93</td>
<td>62</td>
</tr>
<tr>
<td>15≥25</td>
<td>42</td>
<td>28</td>
</tr>
<tr>
<td>&lt;25</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>14.38 ±9.61</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1: Distribution of nurses in the study sample by work units (n=150)

Figure 2: Distribution of nurses by attended training program (n=150)
Table 2: Staff Nurses' knowledge concerning COVID-19 throughout program phases (n=150)

<table>
<thead>
<tr>
<th>Total knowledge of COVID-19</th>
<th>Time</th>
<th>x² (p-value)</th>
<th>x² (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Follow Up</td>
</tr>
<tr>
<td>Satisfactory (≥50%)</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>97</td>
<td>64.7</td>
<td>111</td>
</tr>
<tr>
<td>Unsatisfactory (&lt;50%)</td>
<td>53</td>
<td>35.3</td>
<td>39</td>
</tr>
</tbody>
</table>

(*** highly statistically significant p<0.01)

Table 3: Staff Nurses' infection prevention Practice related to COVID-19 throughout the program phases (n=150)

<table>
<thead>
<tr>
<th>Infection prevention total Practice</th>
<th>Time</th>
<th>x² (p-value)</th>
<th>x² (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Follow Up</td>
</tr>
<tr>
<td>Good practice (≥60%)</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>77</td>
<td>51.7</td>
<td>133</td>
</tr>
<tr>
<td>Poor practice (&lt;60%)</td>
<td>73</td>
<td>48.3</td>
<td>17</td>
</tr>
</tbody>
</table>

(** Highly statistically significant p<0.01)

Table 4: Staff Nurses' attitudes towards COVID-19 throughout program phases (n=150)

<table>
<thead>
<tr>
<th>Total Attitude towards COVID-19</th>
<th>Time</th>
<th>x² (p-value)</th>
<th>x² (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Follow Up</td>
</tr>
<tr>
<td>Positive attitude (≥60%)</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>57.8</td>
<td>137</td>
</tr>
<tr>
<td>Negative attitude (&lt;60%)</td>
<td>63</td>
<td>42.2</td>
<td>13</td>
</tr>
</tbody>
</table>

(** Highly statistically significant p<0.01)

Table (5): Total Resilience levels of studied staff nurses regarding dimensions pre-program (n=150)

<table>
<thead>
<tr>
<th>Resilience Dimensions</th>
<th>Resilience level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High &lt;75</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Philosophical pattern</td>
<td></td>
</tr>
<tr>
<td>Rational pattern</td>
<td></td>
</tr>
<tr>
<td>Situational pattern</td>
<td></td>
</tr>
<tr>
<td>Dispositional pattern</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>philosophical pattern</td>
<td>22</td>
<td>12.4</td>
<td>29</td>
<td>16.4</td>
<td>118</td>
<td>71.2</td>
</tr>
<tr>
<td>Rational pattern</td>
<td>26</td>
<td>14.7</td>
<td>33</td>
<td>18.6</td>
<td>110</td>
<td>66.7</td>
</tr>
<tr>
<td>Situational pattern</td>
<td>43</td>
<td>24.3</td>
<td>43</td>
<td>24.3</td>
<td>83</td>
<td>51.4</td>
</tr>
<tr>
<td>Dispositional pattern</td>
<td>32</td>
<td>18.0</td>
<td>37</td>
<td>21.0</td>
<td>100</td>
<td>61.0</td>
</tr>
</tbody>
</table>
Table 6: Mean scores of staff nurses according to their level of resilience throughout program phases

<table>
<thead>
<tr>
<th>Resilience dimensions</th>
<th>Phases (scores: max=5)</th>
<th>Kruskal Wallis Test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Follow up</td>
</tr>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Median</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>philosophical pattern</td>
<td>1.00±0.36</td>
<td>1.50</td>
<td>3.00±0.48</td>
</tr>
<tr>
<td>Rational pattern</td>
<td>2.00±0.41</td>
<td>2.00</td>
<td>3.00±0.61</td>
</tr>
<tr>
<td>Situational pattern</td>
<td>1.96±0.18</td>
<td>2.00</td>
<td>3.90±0.13</td>
</tr>
<tr>
<td>Dispositional pattern</td>
<td>1.74±0.32</td>
<td>1.88</td>
<td>2.84±0.27</td>
</tr>
<tr>
<td>Total</td>
<td>1.82±0.38</td>
<td>2.82</td>
<td>2.84±0.27</td>
</tr>
</tbody>
</table>

(*) Highly statistically significant p<0.01

Table 7: Correlation matrix of knowledge, attitude, infection prevention practice and total resilience scores

<table>
<thead>
<tr>
<th>Total Scores KAPs concerning COVID-19</th>
<th>Spearman's rank correlation coefficient</th>
<th>Total Scores resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowled ge</td>
<td>Knowledge</td>
<td>Attitude</td>
</tr>
<tr>
<td>Knowledge</td>
<td>.617**</td>
<td>.646**</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>infection prevention Practice</td>
<td>.670**</td>
<td>.641**</td>
</tr>
<tr>
<td>Total Scores resilience</td>
<td>.618**</td>
<td>.641**</td>
</tr>
</tbody>
</table>
Discussion

Coronavirus Disease of 2019 (COVID-19) emerged in 2019. It spread widely and was stated as a pandemic on 11th March 2020 by the World Health Organization (WHO) (Anjorin, 2020). The effect of the pandemic has been massive as it affected the social, economic, and political features of countries, with the health sector disproportionately impacted globally (Yoosefi et al., 2021). Healthcare workers are considered the frontline fighters of the pandemic. They provided care at the threat of their lives through frequent contact with infected individuals. However, scarce personal protective equipment (PPEs), limited human resources, lack of training, and increased workload, have exposed health workers to physical and psychological trauma (Saleem et al., 2021). This study aims to evaluate the effect of the COVID-19 training program on resilience among staff nurses.

This study illustrates that there was overall a highly statistically significant improvement in studied staff nurses’ knowledge regarding COVID-19 in the follow-up phase \( p<0.01 \) as compared to the pre-intervention phase. This result supports the first research hypothesis. From the researchers 'points of view, this result might be due to inadequate staff nurses' knowledge about COVID-19 because they didn’t attend previous training programs about COVID-19. The increasing knowledge acquired after the program might be explained by the simple, clear, and concise way of presenting lectures and videos and the availability of the handout to deliver the materials about COVID-19 during the program.

These findings were supported by Al-Guindy, El-Shahate & Allah (2021) who conducted a study on nurse interns and found that there was a general enhancement of their total knowledge level after program intervention. In the pre-program phase, more than one-quarter of the intern nurses' knowledge level was inadequate, while in the post was improved to become adequate. on the same line, the result reported by (El Metwaly et al., 2020) concluded that there was a highly significant difference between the total COVID-19 knowledge score pre-intervention and post-intervention. Additionally, this finding was similar to another recent study done by Shu-Ching, Year-Hur & Shiow-Luan (2020) who confirmed the importance of applying the latest knowledge of COVID-19 to protect nursing staff and all healthcare professionals.

Concerning staff nurses' attitudes towards COVID-19, the findings of the current study illustrated that there was a highly statistically significant improvement in studied staff nurses' attitudes towards COVID-19 in the post and follow-up phases \( p<0.01 \) as compared to the pre-intervention phase. This result supports the second research hypothesis. These findings might be due to all medical health sectors, especially nurses, looking for information about COVID-19, transmission mode, and prevention measures during the pandemic. Besides, this highly positive attitude explains the excellent level of knowledge acquired during the program.

These findings were supported by El Shenawie et al., (2020) who revealed that there was a highly statistically significant improvement in studied nurses' attitudes toward caring for patients with COVID-19 immediately and after two months of implementation \( (p = <0.001) \). Moreover, this result was in agreement with a previous study that was conducted by Wahed et al., (2020) who assessed the knowledge, attitudes, and perceptions of healthcare providers regarding COVID-19 at different types of hospitals in Fayoum, Egypt. They found a positive attitude was observed among allied health professionals more than physicians.

Regarding staff nurses' infection prevention practice, the finding of the present study indicated that there was a highly statistically significant improvement in studied staff nurses' infection prevention Practice in the post and follow-up phases \( p<0.01 \) as compared to the pre-intervention phase. This result supports the third research hypothesis. This result might be due to the nurses' identified importance of safety measures in protecting them from COVID-19 after the program and fears of infection transmitted from patients or other health care
workers during the epidemic. Also, the availability of resources and personal protective measures such as face masks, alcohol dispensers, continuous hand washing, cleaning, and sterilization.

This finding was supported by the results of Choi et al., (2020) who deep-rooted the strong need for the accessibility of resources to ensure effective nursing care. This is in the same line with the result of El Pansiony et al., (2021) who found that for nurses’ practices during the pre-program period, the mean score of nurses’ practices was at an unsatisfactory level which enforced the researchers to determine the causes through utilizing a sheet containing barriers for implementation of infection control measures, the results found that the overcrowded at hemodialysis unit, insufficient supplies, noncompliance to infection control program and insufficient infection control practices training were the most common causes.

In relation to the resilience of studied staff nurses throughout intervention phases. The result showed that the post-phase and follow phases demonstrated statistically significant improvement in total resilience levels among studied staff nurses. These results suggest that the implementation of the program enhances resilience for nurses. This result confirmed the fourth hypothesis. The finding of the present is supported by the result of Mintz-Binder (2021) who stated that there was a statistically significant increase in resilience among emergency nurses after intervention.

**Conclusion:**

Based on the results of the present study it can be concluded that there is a highly significant improvement in staff nurse’s knowledge, infection prevention practice, and attitude after the training program. Also, the study result showed that statistically significant improvement in all dimensions of resilience after the training program. Also, the study result clarifies, that there was a positive strong statistically significant correlation between knowledge, infection prevention practice, attitude, and total level of resilience scores after the training program. Finally, on this result, the effectiveness of the training program had been achieved in increasing staff nurse's resilience level and the study hypothesizes was achieved.

**Recommendations:**

The following recommendations are suggested based on the results of the current study:


2. Continuous updating of the content of nursing training about principles of infection control to ensure that nurses are sufficiently qualified to play frontline nursing roles, especially during the pandemic.

3. Necessary resources should be available to allow nurses to work in a safe environment that may help in increasing resilience levels during the fight against COVID-19.

4. Nurse leaders should focus efforts to support both individual and organizational resilience, stress reduction, and wellness strategies to enhance nurse well-being as well as retention.

5. Nurse leaders should consider a bundle of evidence-based resilience interventions to prioritize the mental health and wellness of their staff.

**Future study:**


References:


emigrant physicians combating COVID-19 in the United Kingdom: a qualitative phenomenological analysis. BMC Health Services Research. ;21(1):1–8. [PMC free article] [PubMed] [Google Scholar] [Ref list]


