



THE EFFECTIVENESS OF AN E-COUNSELING PROGRAM BASED ON LAZARUS' THEORY USING SOME ARTIFICIAL INTELLIGENCE APPLICATIONS IN REDUCING PSYCHOLOGICAL STRESS AMONG NURSES IN RIYADH.

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Abstract

The current study aimed to determine the effect of an electronic counseling program based on Lazarus theory (cognitive assessment) using artificial intelligence applications in reducing psychological stress levels among nurses in the city of Riyadh. The study sample consisted of 20 male and female nurses working at King Khalid University Hospital, and their ages ranged from 25 to 40 years. A quasi-experimental design was used with two groups: control and experimental. An electronic consultation program was developed and a mobile application was designed to be installed on smart phones. The psychological stress scale developed by Toft and Anderson (1981), translated by Al-Shuwaiki (2019), was used, which consists of three dimensions: professional and emotional interaction with patients, workload, and professional communication with nurses and doctors. The study reached the following results: There were differences in the average scores of members of the experimental and control groups in the post-measurement of the psychological pressure scale in favor of the experimental group. There are differences between the average scores of the experimental group members in the pre- and post-measurements in favor of the post-measurement. There are also differences between the average scores of the experimental group members in the follow-up measurement in favor of the follow-up measurement, which indicates the effectiveness of the electronic consultation program.

Keywords: Electronic counseling, artificial intelligence applications, psychological stress, nurses, Lazarus theory.

Introduction to the Study

Preamble

The present era is witnessing great development in many social, economic, and cultural aspects. This development and change have encompassed many different areas of life and has affected many aspects of the lives of individuals and human societies. Consequently, it has led to increased workloads, the emergence of many different problems that have negatively reflected on the psychological and physical health of individuals, leading to the spread of psychological stress in many societies, until stress has become an essential feature of this era.

Psychological stress is widespread in work environments that require those in charge to interact directly with people and in which individuals dedicate themselves to serving others. Individuals in these environments are exposed to multiple and ongoing problems and pressures, and at that time they feel pressure and tension and that they are useless and suffer from psychological stress (Sabirah and Ismail, 2015, p.149).

Nurses are among the most exposed individuals to psychological stress; due to the nature of the work they do, and their sense of responsibility towards the patients they care for and the excessive workload that may lead them to psychological pressures that affect their performance at work, and this is what Selye pointed out in his physiological theory that stress is the main factor causing psychological stress, and that individuals respond to pressure with different responses, according to their individual differences and the difference in the stressful environment, in addition to their exposure to psychological and social problems that make them susceptible to stress and psychological crisis, and then the feeling of anxiety and psychological stress (Suleimani and Wada, 2020, p.2).

Long-term exposure to stress can lead to work stress or personal conflicts, and to a wide range of disorders, including stress-related disorders. According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10), stress-related disorders include a range of mental disorders, including post-traumatic stress disorder, acute stress reaction, adjustment disorder, and other stress responses after painful or stressful life events (Asplund et al, 2023, p.1)

Given the nature of the work of nurses and nurses from night shifts and commitments to patients, they do not have enough time to seek help, and as a result, they are in urgent need of guidance and therapeutic methods that help them to reduce the severity of the psychological stress they feel during their work. E-Counseling and therapeutic programs have emerged using some artificial intelligence applications that are loaded on smart devices. Among these applications is the "Pacifica" application, which helps individuals who suffer from psychological disorders to reduce psychological stress through daily breathing exercises; in order to introduce the largest amount of oxygen needed for brain function. These smart applications also work to treat anxiety and depression through relaxation therapy and other methods of psychological treatment (Vu, 2018, p.72)

As a result of the state of psychological stress that nurses suffer from, they need to possess skills and abilities that help them to deal with stressful situations and events, and to make necessary decisions. Lazarus mentioned in his theory (cognitive assessment) a set of methods and strategies that help individuals to deal with stressful situations and events, called coping styles or strategies. It is a dynamic behavior that appears in a stressful situation to avoid it completely, or to reduce its multiple effects, or to bear it, accept it, and adapt to it because it is inevitable (Lazarus, 1993, p.32).

Therefore, the present study sought to build an E-Counseling program based on the theory of "Lazarus" using some artificial intelligence applications in reducing psychological stress among nurses in Riyadh City.

Study Problems: Nursing is a demanding profession, due to its characteristics and the multiple tasks and responsibilities associated with it. These factors affect the workers in this profession and constitute a source of psychological stress and cause them to feel stressed.

Nursing staff face many challenges and difficulties, both personally and professionally. This is due to the nature of the work, which is based on caring for patients, helping them to heal, and instilling a sense of peace in their souls. In addition to the psychological pressures of heavy workload and lack of manpower, which exposes them to anxiety and frustration, and thus they feel psychological stress. This leads to feelings of depression, the development of behaviors that are not capable of success and adaptation, a lack of a sense of personal achievement, and emotional exhaustion (Al-Qahtani, 2015, p. 115).

This is confirmed by the results of the study (Hanafin, 2020, p.370 and Kabakleh, 2020, p.1), which found that nurses suffer from high levels of psychological stress, anxiety, and depression due to workload, lack of social support, and a demanding work environment.

Workers in the nursing profession face many problems in their work environment. The ability to perform tasks to the best of their ability requires the availability of medical equipment and supplies. The absence or lack of these supplies can disrupt the nurses' ability to perform their duties and may put patients' lives at risk if they are not given treatment immediately. The nature of nurses' work requires a high degree of concentration and accuracy. One of the risks of this profession is the possibility of contracting serious and deadly diseases. Nurses also have responsibilities outside of their work. Whether they want to or not, they will find their thoughts turning to those responsibilities while they are at work. This can cloud their thinking and hinder their concentration while performing their duties, placing them in severe stress and tension, which can negatively affect their performance of their duties as required Al-Aty, 2017, p.6). This is what the results of many studies have found, such as the study (Suleimani and Wada, 2020; Abd El-Muttalib et al., 2019; Hanafin et al, 2020, p.370 and McCay, 2019, p.1), which found that the work environment plays a major and important role and affects the efficiency of nurses and their work.

Workers in the nursing profession suffer from multiple workloads, many tasks and responsibilities, night shifts, being away from their families, and the need to contain patients and bear their emotions. All of these stressful situations and events affect them and lead to exposure to psychological and physical disorders, which affects their work performance and their ability to cope effectively with stressful events and situations. Nurses feel physical and psychological stress and exhaustion of their energy, as proven by the results of the study (Al-Shahrani, 2023, Janady and Oushikh, 2020, Maryam, 2008, p.475).

The mental health of workers in the nursing profession is one of the important factors that affect the health of the patient. A nurse who is psychologically stressed does not have the ability to instill a sense of peace in the hearts of patients and raise their morale, as a result of what he suffers from psychological stress. This is indicated by the results of the study (Abu Arub, 2004, p.1000; Carrig, 2019, p.1 and Fiol-Deroque et al., 2021, p.1).

Lazarus (Lazarus, 1993, p.5) has shown in his cognitive assessment theory that when an individual is exposed to a situation or event; he evaluates the situation as stressful or dangerous to him. He then begins to use cognitive and behavioral coping strategies to deal with the situation. These strategies and coping styles help individuals to adapt to stress and deal effectively with stressful situations and events that occur in their daily lives. These strategies and coping styles will be employed by placing them in a smartphone app and training participants on how to use them in situations and events that cause psychological stress in this study.

Therefore, this study comes to answer the following main question: What is the effectiveness of an E-Counseling program based on the "Lazarus" theory using some artificial intelligence applications in reducing psychological stress among nurses in Riyadh city?

Questions of the Study:

This main question is divided into the following sub-questions:

1. What are the differences between the mean ranks of the scores of the experimental group and the control group in the post-test on the psychological stress scale among nurses in Riyadh city due to the use of an E-Counseling program based on the "Lazarus" theory using some artificial intelligence applications?
2. What are the differences between the mean ranks of the scores of the experimental group in the pre-test and post-test on the psychological stress scale among nurses in Riyadh city due to the use of an E-Counseling program based on the "Lazarus" theory using some artificial intelligence applications?

Objectives of the Study:

The study aimed to achieve the following objectives:

1. Identifying the differences between the of the experimental average grades To identify the differences between the mean ranks of the scores of the experimental group and the control group in

the post-test on the psychological stress scale among nurses in Riyadh city due to the use of an E-Counseling program based on the "Lazarus" theory using some artificial intelligence applications.

2. To determine the differences between the mean ranks of the scores of the experimental group in the pre-test and post-test on the psychological stress scale among nurses in Riyadh city due to the use of an E-Counseling program based on the "Lazarus" theory using some artificial intelligence applications.

Importance of the Study

The importance of the study lies in its focus on an important professional group in society, namely nurses, and the most prominent problems they face, using an E-Counseling program based on the "Lazarus" theory. In addition, the study uses a technology that is important, namely some artificial intelligence applications, which is represented in a smartphone application, and invests it in psychological counseling. Thus, the study gains importance at both the theoretical and practical levels as follows:

First: Theoretical importance:

1. The current study benefits in enriching the field of electronic counseling and psychotherapy in the field of specialization.
2. Highlighting the category of nurses through what they face of increasing daily burdens and pressures, which may affect their psychological and social compatibility and their work performance.

Second:

Practical Importance:

1. Benefiting from the results of the study in guiding workers and specialists in the field of counseling and psychotherapy on the importance of activating counseling and treatment services online in conjunction with activating electronic services in all other fields.
2. Preparing a smart electronic application that includes a set of techniques and skills that help individuals who suffer from stress, anxiety, and tension to cope with stressful situations and events.
3. The results of this study may contribute to the preparation of preventive and guidance programs for nurses, and to mitigate the negative effects of psychological stress.

Limitations of the study:

Objective limits: The current study was limited to the development of an E-Counseling program based on the Lazarus theory using some applications of artificial intelligence to reduce psychological stress in nurses.

Spatial limits: The current study was limited to King Khalid University Hospital in Riyadh.

The current study was limited to nurses working at King Khalid University Hospital :**Human limits** in Riyadh.

Temporal limits :The study was applied during the second semester of the academic year 1443/1444 AH.

Study Terminology:

E-Counseling Program:

E-Counseling Program Defined as "a guided intervention program conducted by a counselor implemented through technological communication media, including telephones, the internet, and video conferencing, with the aim of helping individuals solve their problems, create a positive environment that promotes improvement and enhances knowledge" (Barak et al, 2009, p.5).

In the current study, it is operationally defined as "a counseling program where sessions between the psychologist and the client are conducted remotely using some information technology tools such as **Zoom**. It is measured by the score obtained by the subject on the scale used in the current study."

Psychological Stress:

Lazarus (1993, p.32) defines psychological stress as "the process of evaluating events and situations, and the emotional, behavioral, and physiological response. It also refers to the degree of an individual's response to environmental changes and events in their life. These changes may be harmful and lead to physiological effects. These effects vary from person to person depending on the individual's personality and psychological characteristics."

The study adopts Bos's (2013, p.562) operational definition of psychological stress as the physiological or psychological response to internal or external pressures. Stress includes a set of changes that affect every system in the body, impacting people's feelings and behavior. For example, increased heart rate, sweating, increased negative emotions for an extended period of fatigue. Psychological stress manifests as severe tension in general adaptation syndrome, and stress directly contributes to psychological and physiological disorders and diseases, affecting mental and physical health, consequently reducing quality of life. It is measured by the score obtained by the subject on the psychological stress scale used in the current study.

Artificial Intelligence:

Hassan (2020, p.221) defines artificial intelligence as "a science based on the devices and programs that have been assembled in computers, which in turn perform many of the tasks and operations that humans can perform but differ from them in terms of speed and accuracy in finding solutions to complex problems."

Theoretical framework

E-Counseling

Concept of E-Counseling

The concept of E-Counseling is one of the modern concepts that have been addressed by experts in the field of psychological counseling. There are a number of definitions of this concept, including the definition of Amani (2007, p.4) which indicates that it is "providing mental health, social, and professional services through the use of the internet". It is also "a process of counseling, training, helping, and empowering individuals or groups to face the challenges of their daily lives through the use of technology".

Brown (2012, p. 8) argues that E-Counseling is "services provided by a psychologist over the Internet and includes various means such as: e-mail, chat rooms, online conferencing and other means."

AlMomani (2017, p.214) defines it as "providing psychological counseling services through the internet using email, video, chat, audio conferences, live video, and any other technological means suitable for this purpose".

Johnson (2017, p.38) defines E-Counseling as "a broad term used to describe electronic communications over the internet for the purpose of providing counseling services; that is, providing an online counseling program using the programs it provides, such as email, chat via computer or smart phone applications, such as WhatsApp, text messages, or direct video consultations via Skype, FaceTime, and others."

Based on the above, it is clear that E-Counseling consists of providing mental health services of all kinds through the internet using various technological means. In the current study, it is defined as "the use of information technology in providing psychological counseling services to individuals and helping them to solve their problems and overcome them efficiently and effectively".

Types of E-Counseling:

In the context of the orientations for using E-Counseling, attempts began to provide counseling using regular mail, then using the phone, then computer and video conferencing, and then websites on the Internet. Sussman (2004, p.4) mentioned two types of E-Counseling, as follows:

First type: E-Counseling over the phone: This is the counseling that is provided through the telephone network. The dialogue is conducted between the psychological counselor and the client through some specialized centers and clinics that provide telephone counseling services to clients. Currently, some technological developments have emerged to support telephone counseling, such as the emergence of multi-input and output phones, and smartphones that allow a session to be held in which the psychological counselor and the client participate. They help the client to communicate with the counselor at any time and place with complete freedom, privacy, and security.

Another type of E-Counseling through video conferencing: This is the achievement of communication between the psychological counselor and the client through video conferencing over the internet, which requires institutions to provide comprehensive technical support for both the hardware and software components necessary to succeed in that process, as well as at the other end (the received client) and the accompanying difficulties in facing its technical problems in addition to the high cost. The slowness resulting from using telephone lines to display the video broadcast over the network may lead to the weakness of this visual communication with the slowness of data delivery between the counselor and the client. Especially since video requires high speed and space of pumping through the network to reach a complete and suitable appearance for the movements of video files; with the note that it will be difficult for the psychological counselor to see the client and follow his non-verbal interactions that may be lost as a result of the slow electronic sending through the network for the file).

Al-Nemr and El-Masry (2011, p.180) point to the existence of a fourth type of E-Counseling, which is E-Counseling through websites, where the internet is used as a tool for transferring data and providing the materials the client needs. The counselor often communicates with the client either through email or through chat rooms (chat) over the network.

The last type is known as E-Counseling through computers, where programs that rely on the use of computers by the psychological counselor and the client during the counseling process are provided without connecting to the internet. Counseling service is provided through the connection between computer devices through an internal network to connect a group of computers. All that happens is a network connection between the computers (internal) and the main computer (remote), which is the server computer for the internal network. These types of programs have been used to provide treatment and counseling for people with health problems or psychological disorders under the name "Intensive Health Improvement Support System" (Kraus et al., 2010, p.55)

Methods of support and guidance in the E-Counseling environment:

The support and guidance style for the client includes direct and indirect communication methods. The support and electronic communication methods in E-Counseling programs can be classified into:

1- Synchronous communication pattern: This is a pattern in which the psychological counselor and the client interact in the E-Counseling environment at the same time, anywhere, and through chat rooms that allow direct dialogue (whether text, audio, or video). It gives communication the advantage of immediacy, face-to-face speaking and meeting, and focusing on body language and natural human interaction. This process of communication can be used to replace traditional interviews or used alongside traditional sessions (Skype, Zoom, Messenger Video).

2- Asynchronous communication pattern: It is done in an indirect and asynchronous way that does not require the client to be present at the same time or place. It is done through some technological techniques such as: email, where information is exchanged between the counselor and the client at different times. The client chooses the times and places that suit him, and the feedback in it is delayed and the specialist cannot observe body language and the visible features on the client. In addition, personal email is a more concise and detailed style, and more private than conversations that may take place over the phone or chat rooms. Also, email gives the client the opportunity to present everything he wants in a written form with the review of its elements and the realization of what he may have forgotten.

3- Synchronous and asynchronous communication pattern: It is the integration and integration of the synchronous and asynchronous communication pattern. Communication, interaction, feedback, observation of behavioral manifestations, and body language in it are done in a direct and sometimes indirect way. It contains a set of media that are designed to complement each other (Abdul Majeed and Al-Any, 2015, p.77).

Ethical standards for E-Counseling:

E-Counseling is subject to a set of ethical standards that support the practice of counseling over the Internet, including those relating to the professional responsibility of the counselor, the mutual trust between the parties, while maintaining the relationship between the parties. The following are some of those standards (Bloom & Sampson, 2001, p10):

First: Regarding the professional responsibility of the counselor: The client's rights must be preserved in terms of not disclosing their secrets, as well as leaving the client the freedom to choose to enter or withdraw from the counseling relationship, and not pressuring them to continue with it, Commitment not to violate their privacy, or mock or ridicule them, and to provide them with the assistance they need, and to respect and appreciate them, and to avoid entering into a counseling relationship with the client that has no meaning or purpose.

Second: Regarding mutual trust between the two parties: The client's privacy must be respected, and their personal affairs should not be disclosed or discussed except when necessary.

Assume responsibility for the client and be fully aware of the legality of this responsibility and clarify the limitations or situations that call for breaching the client's privacy and its reasons - to the client himself - if necessary.

The reliability of keeping the client's records in complete confidentiality and placing them in a safe place and protecting them from damage whether they are recorded or in digital form or on any other medium, and not exchanging or disclosing the client's private information with other relevant entities or centers without specific and known policies and procedures that ensure the protection of privacy and trust in that information.

Third: Regarding the relationship between the two parties: The client's records must be kept, whether in audio or visual form, as well as all data and information stored electronically, and they may not be disclosed to anyone without the client's knowledge.

The data stored in electronic form must also be secure by using the protection methods available on the computer, and when disposing of them, this is ensured after ensuring that they have become worthless to the counseling relationship.

Zaatar et al. (2021, p. 469) also added the most prominent ethics and conditions when practicing E-Counseling:

- 1- The availability of various means of communication and that they are easy to use and master.
- 2- Maintain the confidentiality of information, data, and electronic communications.
- 3- A prior agreement between the two parties in the form of a "Remote Mental Health Practice Service Contract" specifying the type of communication, its stages, its objectives, the timing, and number of times of communication per week, the cases of resorting to visual or audio recording, and other elements that the psychological counselor deems to be of importance.
- 4- Considering individual differences and variations.
- 5- Maintain a professional relationship between the psychologist and the client.
- 6- Be careful to control and control emotions, and not let communication go beyond the professional relationship.
- 7- Carefully avoid being too hasty or rushing when providing guidance and advice.

Through the previous presentation, it becomes clear that there are a set of standards and ethics that the psychological counselor must adhere to when using E-Counseling, in terms of maintaining the confidentiality of information and building a counseling relationship based on acceptance and trust between him and the client. All the systems, laws, and conditions that apply in traditional counseling are also applied in E-Counseling, and therefore there is no difference between E-Counseling and traditional counseling in terms of ethical standards and values.

Advantages of E-Counseling:

E-Counseling has many advantages and pros that make many counselors accept its use. The most prominent of these advantages are the following (Al-Shaalan, 2013, p. 329):

- 1- It helps to increase the client's self-confidence and reduce resistance.
- 2- Ease of expressing emotional aspects among clients due to their lack of knowledge of their identity.
- 3- Flexibility in dealing with it outside official working hours, and the possibility that it can be combined between a counselor and a client who live in two distant countries.
- 4- Ease of obtaining guidance simply by having a computer connected to the Internet, in addition to the privacy available to the individual in obtaining guidance while in a library or at home.
- 5- Anonymity; Keeping identity anonymous while receiving guidance is a more available option than it is in traditional guidance.
- 6- Reduced sense of social stigma, as sessions do not take place in attendance and face-to-face.

Kraus et al. (2010, p. 141) add several advantages to E-Counseling, including:

- 1- It is an effective means for individuals who suffer from social phobia and anxiety as it is considered a more comfortable and reassuring means of expressing feelings without seeing the client.
- 2- It allows the client to keep records and refer back to the consultation at any time and read it more than once to be able to view and evaluate it.
- 3- Not disclosing the individual's identity helps reduce racial, gender, age, and physical appearance biases, and is also a reason for increasing the credibility and validity of the consultation.
- 4- Benefit from the media available via the Internet from pictures, videos, e-mail, electronic psychological tests, and electronically computerized diagnostic and treatment tools.
- 5- Helps the busy clients who is unable to go to counseling centers to communicate with the e-counselor.
- 6- It does not require scheduling, timetables, or advance reservations like face-to-face counseling.
- 7- It is a good means for cases suffering from agoraphobia or people with physical disabilities.
- 8- It facilitates communication with individuals who live in remote or rural areas as well as those who are unable to leave their countries.
- 9- This type of counseling is good in cases where there is a shortage of qualified counselors in a particular field or those who do not reside in the place where the client resides.

Through the above, it is clear the pros and advantages of E-Counseling, and the advantages of practicing E-Counseling have appeared in the Corona pandemic, encouraging, and promoting aspects of prevention to maintain social distancing and protect the counselor and client from infection and the spread of the virus. It is free most of the time and contributes to spreading psychological and social culture and awareness and combating bad social habits related to the process of counseling and psychotherapy.

Cognitive Assessment Theory of Lazarus:

Richard Lazarus (Lazarus, 1993, p. 9) is the pioneer of this theory, as this theory emerged as a result of the great interest in the process of perception and sensory treatment, and cognitive assessment is the basis on which this theory is built, and it depends on how the individual perceives and evaluates situations and events that cause stress, since The assessment of the situation and the event as stressful depends on the individual's view of this situation and his judgment on it, and this assessment depends on the individual's personal experiences, capabilities, readiness, and the environment surrounding him. All of these are factors that help the individual assess these stressful situations and events to

which he is exposed. Lazarus sees that individuals are exposed to three types of stressful events and situations, which are:

- **External events:** These are represented by the external environmental events that the individual faces in his environment and require him to conform to them, such as crises, pollutants, and natural disasters such as earthquakes, hurricanes, floods, and other events.
- **Public events:** These are those that a large number of people are affected by.
- **Special events:** These include the desires, goals, and ambitions of the individual, and the position they seek in their life such as achieving a promotion in their job, obtaining a high position, or traveling to a certain place (Lazarus & Folkman, 1984, p. 53).

The individual's assessment of stressful events and situations is done through three types of assessment (Dardir, 2010, p. 65):

1. **Initial assessment:** It is the individual's issuance of a specific initial assessment of the event he faces and the degree of its threat. The individual may assess the event as negative or positive, severe or weak. The initial assessment is affected by the factors of the situation or event as it includes the nature of the harm or danger or threat or if the situation was previously exposed to it or new or had never been known before, and the possibility of its occurrence and the extent of its clarity or ambiguity in predicting the outcome.

2. **Secondary assessment:** It relates to the coping resources that the individual possesses. He assesses his own skills and capabilities to deal with stressful situations or event. These resources include his skills and abilities, social support and material resources, or any other resources that he possesses that help him restore balance and adapt to the environment.

3. **Reassessment:** Where any new information about the situation or about the individual leads to changing the assessment from the beginning, and the assessment process ends with the identification of appropriate mechanisms and methods to confront the stressful situation or event and overcome it through coping strategies and method.

The individual resorts to using cognitive and behavioral strategies to cope with the stressful situation. It refers to the sum of cognitive and behavioral efforts made to control or reduce internal or external requirements that threaten or exceed the individual's resources and cause stressful situations. Coping is divided into two types (Abdali, 2012, p. 51):

1- **Emotion-focused confrontation:** It aims to change the emotional outcomes of stressful situations through specific behaviors such as physical or mental withdrawal, relaxation, and denial. It includes two types of strategies:

- **Behavioral emotional strategies:** Some of them are positive, such as practicing sports exercises, developing hobbies, resorting to the spiritual side, practicing some relaxation techniques, using humor and laughter, resorting to family and friends, and some of them are negative, such as: biting nails or lips, shaking legs, i.e. bodily translated tension, which are phenomena that may develop if stress continues for a long time into dangerous and wrong practices such as: drinking alcohol, drug abuse, or gluttony.

- **Emotional cognitive strategy:** This includes changing the meaning of the situation by reevaluating it, postponing thinking about the problem to another time, and expressing emotions.

2- **Problem-focused confrontation:** In which the individual performs certain actions and behaviors that aim to alleviate stressful events and situations, such as gathering information, searching for solutions, and managing goals (Lazarus & Folkman, 1984, p. 141)

The most prominent strategies of this type are the following (Zarwal, 2008, p. 134):

- **Behavioral strategies in problem solving:** These are the behaviors followed by the individual in order to solve the problem effectively, by controlling the situation or avoiding or withdrawing from it, such as putting several solutions to the problem and choosing which one is more useful, then implementing it or making a decision to leave the job or submit to the demands of the partner.

- **Cognitive strategies in problem solving:** This latter depends according to Beck on the way the individual understands the event or situation, which determines the emotional response to it. It includes attempts to manage, control, and control the way the individual perceives the stressful event;

As considering that failure to get a job is due to a deficiency in a certain skill aspect, and then working on strengthening it, or adjusting the level of ambition, or finding other sources of satisfaction (Zarwal, 2008, p. 134).

The current study adopted the cognitive assessment theory of stress; This is due to its belief in the importance and influence of cognitive-perceptual aspects in the occurrence of psychological stress among individuals; where the perception and evaluation of individuals on the situations and events to which they are exposed as stressful or not; In addition to the fact that the cognitive assessment theory has come up with a set of methods and strategies that help to deal with and adapt to stressful situations and events, and these methods were used in its program by employing them in an electronic application that is downloaded on the smart phone, and training nurses on how to use these methods in order to help them cope with stressful events, and thus reduce the level of psychological stress among them.

Artificial intelligence

The concept of artificial intelligence emerged in the early fifties of the twentieth century when a group of scientists used a new approach to produce intelligent machines based on what modern science has reached in neuroscience and the use of new mathematical theories of information (Alyazegi, 2019, p. 260).

Al-Sharqawi (1998, p. 23) defines artificial intelligence as: "A branch of computer science through which computer programs can be created and designed that simulate the style of human intelligence, so that the computer can perform some tasks instead of the human, which require thinking and understanding and hearing and speaking and moving in a logical and organized manner."

Oceana-Fernandez et al (2019, p. 538) define it as "one of the aspects of computer science that relies on providing a variety of methods, techniques, and tools to create models and solutions to problems by simulating the behavior of individuals."

Al-Azzam (2021, p. 476) defined it as "studying how to direct the computer to do things that a human does in a better way." Hassan (2020, p. 221) defines it as "a science based on devices and programs that have been assembled in computers that, in turn, perform many of the tasks and operations that a human can do, but they differ from it in terms of speed and accuracy in finding solutions to complex problems.

From the previous presentation, artificial intelligence is defined as "a science that relies on computers and information technology and is based on simulating human behavior with the aim of reaching solutions to problems, making decisions, and reaching new information."

Artificial Intelligence Applications:

Artificial intelligence has spread very quickly and included various fields, sectors, and areas in society; As a result, multiple and varied applications of artificial intelligence have emerged, the most prominent of which are:

1) Expert systems: These are computer programs that imitate the procedures of experts in solving difficult problems. The experts' experiences are transferred to expert systems so that users can benefit from them in solving problems. They are also a knowledge-based information system that uses its knowledge of special and complex applications to work as a consultant for end users, since the main purpose of expert systems is to assist humans in the thinking process and not to provide them with information, thus making the human being wiser and not just knowledge. Expert systems also use their knowledge base to make decisions and accomplish tasks in a way that achieves the user's goal (Alyazegi, 2019, p. 271).

2) Speech recognition: These are programs that can convert sounds into written words. It consists of several stages (Al-Sharqawi, 1998, p. 44):

First: The stage of processing signals acoustically: The input speech is divided into a number of samples that are selected, then the sound is encoded according to the available knowledge, by digitally converting the audio signals in a way that preserves their acoustic properties and extracting the

properties of the spectral analysis of the frequencies contained in it and determining the fundamental frequency.

Second: The stage of phonetic analysis: The dependence of the recorded spectrum on any of the letters is determined, then the utterances and parts of the letters are determined, then the assembly and adjustment are carried out to reach the phonetic morphological analysis.

Third: The stage of phonetic morphological analysis: Where the types of utterances and the place of stress or elongation are interpreted and determined, and the parts of words and then the words are determined.

3) Natural language processing: These are programs that feed the computer with natural languages so that the computer can receive commands directly from this language, and thus the computer can interact with people and talk to them in this language with ease. One of the most important topics that include the use of computers is machine translation, information retrieval in natural language, and voice speaking through telephone networks.

4) Gaming: Artificial intelligence has contributed to the development and improvement of games and made them closer to reality.

5) Letter recognition and reading: These are programs that can translate a word written in handwriting into words written on a computer, as if it was entered on the computer's keyboard (Al-Masri, 2019, p. 24).

6) Robots: This topic seeks to develop and improve robots that can accomplish various motor and verbal skills by manufacturing a robot that works according to electronic and mechanical engines. These machines have recently been used in the field of wars to enter situations and places that are dangerous to humans (minefields) or for espionage purposes (Al-Atoum, 2012, p. 169).

7) Pattern and shape recognition, comparison, and recognition: The aim is to provide the computer with optical sensors that enable it to recognize the people or shapes present, by developing several artistic methods for image analysis and face recognition.

8) Automated programming: This refers to the ability to find interpreters or super compilers that enable the computer to receive a source code written in a natural language, and then generate a program that the computer can execute (Hassan, 2020, p. 221).

Psychological Stress:

The Concept of Psychological Stress

There are a number of definitions that have addressed the concept of psychological stress, including the definition of Abu Hamad (2013, p. 10), who defines it as "a state of physical fatigue or exhaustion that affects the individual as a reaction to real or expected psychological pressures in life, and people often suffer from stress as a result of sudden events in their lives, as in cases of death or divorce or problems at work or illness. Stress can also occur as a reaction to everyday problems. In addition, people may experience stress in the face of a threat to their lives, for example, an individual may be stressed when he finds himself in a predicament that he cannot get out of."

Barham (1996, p. 26) also defined it as "an abnormal emergency state that affects the individual as a result of internal and external influences that vary in quantity and type and differ in their effects and results on the individual's performance, depending on the individual differences between individuals, and the disappearance of the effects of this state on the individual differs in quantity and type from one individual to another. "

Muhammad (2021, p. 64) defined it as "a psychological disorder that the individual faces as a result of the pressures he is exposed to in the organization, which may not be consistent with his personal capabilities, and leads to decreased productivity and increased turnover rate."

It is clear from the previous presentation that the definition of psychological stress varies from one researcher to another. Some of them see stress as a result of a set of factors that affect the individual, and some see it as a result of the individual's evaluation and assessment of the events and situations that he goes through, and they all agreed that psychological stress affects the individual and his personality and leads to a feeling of tension and anxiety and the emergence of physical and

psychological disorders. In this study, the following definition of psychological stress is adopted: "An organic or psychological reaction to internal or external stimuli that affect the individual's life and personality and makes him unable to adapt properly to the environment in which he lives."

Previous Studies:

Several previous studies related to the current study have been conducted and presented based on their publication year, from oldest to newest, as follows.

First Axis: Studies on Programs for Reducing Psychological Stress among Nurses:

Chang et al. (2019) conducted a study that aimed to evaluate the effectiveness of the Stress-Reduction Application (SR_APP) in monitoring stress levels among newly employed nurses. The study sample consisted of 28 newly employed nurses in a hospital in Taiwan, and they were divided into control and experimental groups. The Psychological Stress Scale was used, and the Wilcoxon test was employed to compare the experimental and control groups. The study found a decrease in stress and tension levels among both the experimental and control groups.

Yektatalab et al. (2020) focused on assessing the impact of online life skills education on stress among nurses. The study sample consisted of 104 nurses experiencing moderate to high levels of stress. The experimental group received online life skills training over a period of 10 weeks. The results showed a significant decrease in overall stress scores, emotional stress, and depersonalization, as well as a significant increase in personal accomplishment. The study concluded that online life skills education was able to reduce stress levels among nurses.

Weiner et al. (2020) conducted a study to examine the effectiveness of an online cognitive-behavioral therapy program developed for healthcare workers during the Covid-19 pandemic. The study sample consisted of 120 healthcare workers facing the pandemic. The Perceived Stress Scale was used, and the results showed a decrease in stress levels and insomnia among the study sample, indicating the effectiveness of the program used.

Gbeddy (2021) focused on evaluating the feasibility of using an online program application to reduce work-related stress among psychiatric nurses. A quasi-experimental design was used, and the study sample consisted of 13 nurses experiencing high levels of stress. The psychological burnout scale was used. The results of the study showed a decrease in the level of job stress after using the program.

Sasaki et al. (2021) aimed to determine the impact of a smartphone-based stress management program on improving work engagement among nurses in Vietnam. The study sample consisted of 99 nurses who were randomly assigned to control and experimental groups. The Depression Scale and Anxiety Scale were used. The results of the study showed an improvement in the level of work engagement among nurses in Vietnam.

Fiol-Deroque et al. (2021) conducted a study focused on examining the effect of a mobile phone-based mindfulness-based intervention on reducing mental health problems among healthcare workers during the COVID-19 pandemic. The study sample consisted of 482 healthcare workers who were randomly assigned to an experimental group and a control group. The experimental group received training via mobile phone targeting emotional skills, healthy lifestyle behavior, social support, and stress. The Anxiety Scale, Depression Scale, and Self-Efficacy Scale were used. The results of the study showed an improvement in the level of anxiety and depression among the experimental group.

Beverly et al. (2022) focused on examining the impact of a calming virtual reality experience on reducing self-reported stress among frontline healthcare workers during the Covid-19 pandemic. The study sample consisted of 102 healthcare workers. Participants viewed a 360-degree video of a lush

green natural sanctuary displayed on a head-mounted display. The results of the study indicated a significant decrease in self-reported stress levels among the healthcare workers.

Santakar et al. (2022) aimed to determine the effectiveness of a smartphone application called "Shift" that included psychological educational materials, cognitive-behavioral units, information on common work pressures, and a section on options for seeking help for psychological problems in reducing symptoms of anxiety and depression among novice doctors. The Anxiety Scale and Depression Scale were used. The study sample consisted of 222 novice doctors, and the results of the study showed a significant decrease in symptoms of anxiety and depression among the doctors.

Henshall et al. (2023) conducted an internet-based training program aimed at enhancing flexibility and psychological well-being among nurses. The study sample consisted of 180 nurses who were divided into experimental and control groups randomly. The training program lasted for 4 weeks and included pre-reading sessions, facilitated online sessions, and peer support. The Psychological Flexibility Scale and Psychological Well-being Scale were used. The study found improvements in psychological flexibility, self-confidence, relationships with colleagues, ability to care for patients, and communication skills. No significant differences were found between the experimental and control groups in terms of psychological well-being, indicating the effectiveness of the program used in the study.

Commentary on the previous studies:

From the previous presentation, it is evident that the current study aligns with most of the previous studies in terms of selecting its sample from nurses, healthcare workers, and doctors, such as the study by Yektatalab et al. (2020), Fiol-Deroque et al. (2021), Sasaki et al. (2021), Gbeddy (2021), Santakar et al. (2022), and Weiner et al. (2020). The results also agree with some previous studies that found statistically significant differences in the study groups after implementing the interventions used. For instance, Fiol-Deroque et al. (2021) found a decrease in psychological stress levels among mental healthcare workers after implementing a mindfulness-based smartphone program. Similar findings were observed in the study by Beverly et al. (2022) and Weiner et al. (2020), where they reported a decrease in stress and anxiety levels among healthcare workers after using an online cognitive-behavioral therapy program.

The current study benefited from previous studies in formulating research questions, defining objectives, formulating research hypotheses, selecting appropriate statistical methods, constructing the counseling program, counseling sessions, and the techniques to be used in the program.

The current study has several distinguishing elements, which are as follows:

1. The current study utilized a smartphone-based electronic program that includes diverse educational and instructional materials. Through this program, participants were able to complete the assigned homework tasks during the counseling program. Additionally, counseling sessions were conducted remotely using the Zoom platform, which has not been previously used to reduce psychological stress among nurses in Riyadh.
2. The program was implemented specifically on nurses working at King Khalid University Hospital.
3. An electronic application was designed that could be downloaded on smartphones through the Android system using the Play and App stores.

Research hypotheses:

Based on the theoretical framework and previous studies, the following hypotheses were formulated:

1. There are statistically significant differences in the mean ranks of individuals' scores between the experimental and control groups on the dimensional measurement of psychological stress among

nurses in Riyadh. These differences can be attributed to the use of an electronic counseling program based on Lazarus's theory, utilizing some applications of artificial intelligence.

2. There are statistically significant differences in the mean ranks of individuals' scores within the experimental group between pre-test and post-test measurements on the psychological stress scale among nurses in Riyadh. These differences can be attributed to the counseling program based on Lazarus's theory, utilizing some applications of artificial intelligence.

Field Study Procedures:

Research Design: The study employed a quasi-experimental design, which was suitable for the nature of the study involving two groups (experimental and control), with pre-test and post-test measurements, and a follow-up. This design was used to test the study hypotheses, with two variables: independent (the electronic counseling program) and dependent (psychological stress).

Population and Sample: The study population consisted of all Saudi nurses working in Riyadh, with a total of 6,548 nurses according to the statistics from the Ministry of Health in 1442. The study sample consisted of 20 nurses who experienced high levels of psychological stress.

Study Sample: Approval was obtained from King Saud University to conduct the study, as King Khalid University Hospital is affiliated with the university. After obtaining approval, the university sent the electronic scale to Saudi nurses working at King Khalid University Hospital. Thirty nurses responded to the scale, and after examining the results, the nurses who scored high on the psychological stress scale were approached to participate in the study. Twenty nurses agreed to participate. They were then randomly assigned to the control and experimental groups, with each group consisting of 10 nurses. The age range of the participants was between 25 and 45 years. The following is a description of the sample characteristics based on variables such as age and years of experience.

Table (1) illustrates the distribution of the study sample according to age.

Variable	Categories	Number	Percentage
Age	25-30	7	35%
	31-35	5	25%
	36-40	7	35%
	41-45	1	5%
Total		20	100%
Years of Experience	1-5	6	30%
	6-10	8	40%
	11-15	6	30%
Total		20	100%

The table above shows that the number of nurses in the age range of (25-30) was 7 nurses, accounting for 35% of the total sample. The number of nurses in the age range of (31-35) was 5 nurses, accounting for 25% of the total sample. The number of nurses in the age range of (36-40) was 7 nurses, accounting for 35% of the total sample. There was one nurse in the age range of (41-45), representing 5% of the total sample. Additionally, the number of nurses with years of experience ranging from (1-5) was 6 nurses, accounting for 30% of the total sample. The number of nurses with years of experience ranging from (6-10) was 8 nurses, representing 40% of the total sample. The number of nurses with years of experience ranging from (11-15) was 6 nurses, accounting for 30% of the total sample. The total number of nurses was 20.

To verify the equivalence between the experimental and control groups in the pre-test measurement of dimensions and the total score of the psychological stress scale, the Mann-Whitney test was used

to examine the differences between the mean ranks of individuals in the experimental and control groups in the pre-test measurement on the psychological stress scale for nurses in Riyadh. The results are presented in Table below:

Table (2): Mann-Whitney Test results to assess the significance of differences between the mean ranks of individuals in the experimental and control groups in the pre-test measurement on the psychological stress scale.

Dimensions	Group	Number	Mean Ranks	Sum of Ranks	"z" Value	Level of Significance
Professional and Emotional Coping	Pre-test Experimental	10	9.05	90.50	35.500	0.269
	Pre-test Control	10	11.95	119.50		
Workload	Pre-test Experimental	10	8.85	88.50	33.500	0.211
	Pre-test Control	10	12.15	121.50		
Professional Communication	Pre-test Experimental	10	11.65	116.50	38.500	0.381
	Pre-test Control	10	9.35	93.50		
Psychological Stress Scale	Pre-test Experimental	10	9.05	90.50	35.500	0.272
	Pre-test Control	10	11.95	119.50		

From the above table, it is evident that there are no statistically significant differences at a significance level of 0.05 between the mean ranks of individuals in the experimental and control groups in the pre-test measurement of the "Professional and Emotional Coping" dimension for nurses in Riyadh ($z = 35.500$, $p = .269$). Similarly, there are no statistically significant differences at a significance level of 0.05 between the mean ranks of individuals in the experimental and control groups in the pre-test measurement of the "Workload" dimension for nurses in Riyadh ($z = 33.500$, $p = .211$). Additionally, there are no statistically significant differences at a significance level of 0.05 between the mean ranks of individuals in the experimental and control groups in the pre-test measurement of the "Professional Communication" dimension for nurses in Riyadh ($z = 38.500$, $p = .381$). Moreover, concerning the total score of the scale, there are no statistically significant differences at a significance level of 0.05 between the mean ranks of individuals in the experimental and control groups in the pre-test measurement on the "Psychological Stress Scale" for nurses in Riyadh ($z = 35.500$, $p = .272$). This indicates the equivalence of the two groups before the experimental group was exposed to the independent variable (counseling program). Additionally, the table reveals apparent differences in the mean ranks of individuals in the experimental and control groups, but these differences did not reach statistical significance in all dimensions of the study scale based on the group variable. The statistical significance was higher than 0.05, suggesting no statistically significant differences in the mean ranks of individuals in the experimental and control groups in the pre-test measurement on the psychological stress scale.

Study Tools:

To achieve the objectives of the study, the following tools were used:

1. Psychological Stress Scale:

In this study, the Psychological Stress Scale developed by Toft and Anderson (1981) and translated by Al-Shawiki (2019) was adopted. This scale was chosen due to its suitability for the study sample, which consisted of nurses. The scale is specifically designed to measure the level of stress among nurses and consists of 32 items distributed across three dimensions: the first dimension is "Professional and Emotional Coping" with 12 items, the second dimension is "Workload" with 10 items, and the third dimension is "Professional Communication with Nurses and Physicians" with 10 items. The response options were based on a five-point Likert scale as follows: Always (5 points), Often (4 points), Sometimes (3 points), rarely (2 points), Never (1 point).

Verification of the psychometric properties of the original form of the Psychological Stress Scale used in the current study:

Al-Shawiki (2019) assessed the reliability of the Psychological Stress Scale by calculating the internal consistency using Pearson correlation coefficient for each item belonging to its respective dimension with the total score. The results indicated that all values of the correlation matrix between the items of each dimension and the total score were statistically significant at a significance level of 0.01, indicating the internal consistency of the scale items.

The researcher also calculated the reliability of the Psychological Stress Scale using Cronbach's alpha coefficient and split-half reliability. The results showed that the values of Cronbach's alpha coefficient for all dimensions of the scale and the total score of the scale were high. The values of Cronbach's alpha coefficient for the scale dimensions ranged from 0.84 to 0.91, and the Cronbach's alpha coefficient for the total score of the scale was 0.93. The values of the corrected Spearman-Brown coefficient ranged from 0.80 to 0.85 for the dimensions, and the corrected Spearman-Brown coefficient for the total score of the scale was 0.75, indicating a high degree of reliability for the scale.

A. Internal Consistency Reliability:

The study tool was applied to a pilot sample of 137 nurses from cities outside the target study sample to assess the reliability and construct the tool using internal consistency reliability. To verify this, the correlation coefficients between the score of each item and the total score of its respective dimension were calculated using Pearson correlation coefficient. The following table presents the results of the statistical analysis for the internal consistency reliability:

Table 3: Pearson Correlation Coefficients for Items of Dimensions (Psychological Stress Scale) with the Total Score of Each Dimension.

Professional and Emotional Interaction with Patients		Workload		Professional Communication with Nurses and Physicians	
Ferry No	Correlation Coefficient	Ferry No	Correlation Coefficient	Ferry No	Correlation Coefficient
1	0.653**	13	0.608**	23	0.694**
2	0.677**	14	0.654**	24	0.546**
3	0.634**	15	0.640**	25	0.645**
4	0.577**	16	0.656**	26	0.692**
5	0.513**	17	0.662**	27	0.632**
6	0.586**	18	0.649**	28	0.674**
7	0.641**	19	0.658**	29	0.712**
8	0.673**	20	0.620**	30	0.685**
9	0.546**	21	0.600**	31	0.676**
10	0.558**	22	0.700**	32	0.655**
11	0.522**	-	-	-	-
12	0.663**	-	-	-	-

** Significant at the level of (0.01)

According to Table 3, all correlation coefficients between the items of the dimensions of the Psychological Stress Scale and the total score of each dimension were significant at a level of 0.01. The correlation coefficients for the dimension of "Professional and Emotional Interaction with Patients" ranged from 0.513 to 0.677. For the dimension of "Workload," the correlation coefficients ranged from 0.600 to 0.700. Finally, for the dimension of "Professional Communication with Nurses and Physicians," the correlation coefficients ranged from 0.546 to 0.712. These correlation coefficients indicate good associations, indicating high internal consistency. Moreover, they suggest high and sufficient validity indicators that can be relied upon in the current study.

Table 4: Pearson Correlation Coefficients for Dimensions of the Psychological Stress Scale with the Total Score of the Scale

Dimensions	Correlation Coefficient
Professional and Emotional Interaction with Patients	0.699**
Workload	0.913**
Professional Communication with Nurses and Physicians	0.802**

** Significant at the level of (0.01)

According to Table 4, all correlation coefficients between the dimensions of the Psychological Stress Scale and the total score of the scale were significant at a level of 0.01. The correlation coefficients for the dimensions ranged from 0.699 to 0.913, indicating good associations. This suggests high internal consistency and sufficient validity indicators that can be relied upon in the current study.

B. Scale Stability:

The stability of the Psychological Stress Scale was assessed by calculating the Cronbach's alpha coefficient and using the split-half reliability method with the corrected Spearman-Brown coefficient, as shown in Table 5.

Table 5: Cronbach's Alpha Coefficient and Split-Half Reliability for the Stability of the Psychological Stress Scale

S. N	Axis	Reliability Coefficient	
		Cronbach's Alpha	Split-Half Reliability
1	Professional and Emotional Interaction with Patients	0.825	0.776
2	Workload	0.807	0.797
3	Professional Communication with Nurses and Physicians	0.857	0.748
Overall Stability		0.900	0.808

Table 5 demonstrates that the study scale has statistically acceptable stability. The overall stability coefficient (Cronbach's alpha) was 0.900, and the split-half reliability after correction with the Spearman-Brown coefficient was 0.808. These are high stability scores. The reliability coefficients for the study instrument ranged from 0.807 to 0.900 with Cronbach's alpha, and from 0.748 to 0.797 with split-half reliability. These are reliable stability coefficients that can be trusted in the application of the current study.

C. Scale correction:

The Likert scale was used, where the psychological stress of the working nurses at King Khalid University Hospital was evaluated using the scale's statements. The ratings were as follows: (5 = Always, 4 = Often, 3 = Sometimes, 2 = rarely, 1 = Never). Then, the total scores obtained by the participants on the scale (total score) were calculated. The highest possible score on the entire scale is 160, indicating a high level of psychological stress. The lowest score on the entire scale is 32, indicating a low level of psychological stress.

Secondly: Lazarus-Based Counseling Program:

An electronic counseling program was developed through an electronic application, based on Lazarus' theory. The counseling program was constructed and prepared by relying on theoretical literature and related studies on the subject. The program consists of 13 sessions, with two sessions per week, each lasting 60 minutes. The program aims to reduce the level of psychological stress among nurses by equipping them with various cognitive, behavioral, and emotional skills that help them deal with stressful and demanding situations they encounter at work. Each session includes specific goals, procedures, methods, diverse activities, homework assignments, and utilized techniques. The program sessions were conducted remotely using the Zoom application, in addition to downloading a mobile application for training on counseling methods and techniques. Appendix 2 illustrates the overall plan of the counseling program.

Foundations of the Electronic Counseling Program:

1. **General Foundations:** Ensuring participants' unconditional acceptance and considering the flexibility of human behavior and its adaptability.
2. **Philosophical Foundations:** The program derives its philosophical principles from Lazarus' theory of cognitive assessment, along with adhering to the philosophical foundations of ethical counseling, confidentiality, professional conduct, and personal integrity. Additionally, it incorporates the principles of counseling and therapy based on Lazarus' theory, such as individual assessment of stressful events and situations, coping strategies and emotion regulation, and problem-solving focused coping methods.
3. **Psychological Foundations:** Considering individual differences and variations among participants.
4. **Educational Foundations:** Aimed at achieving personal and social harmony within and outside the institution.
5. **Social Foundations:** Refers to the use of methods and techniques that facilitate the counseling process, including group counseling sessions.
6. **Physiological and Neurological Foundations:** Involves training in muscle relaxation techniques and considering foundations that help the body achieve a state of complete relaxation.

Thirdly: The Services Provided by the Program:

1. **Counseling Services:** Assisting participants in reducing their psychological stress levels by training them on how to cope with stressful situations and events through group counseling sessions.
2. **Health Services:** Developing participants' knowledge and information about the physical effects of psychological stress, as well as the transformative and common symptoms of psychological pressure and stress.
3. **Psychological Services:** Developing participants' knowledge and information related to psychological counseling and the skill of managing life stressors and dealing with stressful situations.
4. **Social Services:** Training participants in the counseling group on a set of social skills that help them effectively deal with and solve the problems they encounter, such as problem-solving skills and effective communication.
5. **Electronic Services:** Training participants on the use of a smartphone application during and after counseling sessions.

Analysis and Discussion of Study Results:

The results of the first hypothesis, which states that "there are statistically significant differences between the mean ranks of the scores of the experimental group and the control group in the dimensional measurement of psychological stress among nurses in Riyadh city attributed to the use of an electronic counseling program based on Lazarus' theory using some applications of artificial intelligence," were examined using the Mann-Whitney test to verify the differences between the mean ranks of the scores of the two groups in the dimensional measurement of psychological stress among nurses in Riyadh city attributed to the use of an electronic counseling program based on Lazarus' theory using some applications of artificial intelligence. The results are presented in Table 6:

Table 6: Mann-Whitney Test Results for Determining the Significance of Differences between the Mean Ranks of the Scores of the Experimental and Control Groups in the dimensional measurement of psychological stress among nurses in Riyadh city.

Dimensions	Group	Number	Mean Ranks	Sum of Ranks	"z" Value	Level of Significance	Magnitude of impact
Professional and Emotional Coping	Pre-test Experimental	10	5.80	58.00	3.000	0.000	0.67
	Pre-test Control	10	15.20	152.00			
Workload	Pre-test Experimental	10	6.70	67.00	12.000	0.004	0.44
	Pre-test Control	10	14.30	143.00			
Professional Communication	Pre-test Experimental	10	7.95	79.50	24.500	0.053	0.20
	Pre-test Control	10	13.05	130.50			
Psychological Stress Scale	Pre-test Experimental	10	6.05	60.50	5.500	0.001	0.60
	Pre-test Control	10	14.95	149.50			

From the previous table, it is evident that "there are statistically significant differences at a level of (0.05) between the means of the rank scores of individuals in the experimental and control groups in the dimensional measurement of 'professional and emotional interaction with patients' among nurses in Riyadh city, attributed to the use of an electronic counseling program based on Lazarus theory, using some applications of artificial intelligence. The differences favored the experimental group with an average of (5.80), where ($z=3.000$, $p=.000$).

After confirming the presence of statistically significant differences, the Effect Size was calculated for the use of an electronic counseling program based on Lazarus theory, using some applications of artificial intelligence among nurses as an independent variable on the dependent variable "professional and emotional interaction with patients" using eta squared (η^2). The result showed that the effect size in professional and emotional interaction with patients was (0.67), which is a very large effect size according to the eta squared criterion calculated using the following equation: $n^2 = \frac{Z^2}{N-1}$

The effect size associated with the value of **eta squared (η^2)** takes three levels:

1. The effect size is considered small if $0.01 > \eta^2 > 0.06$.
2. The effect size is considered medium if $0.06 > \eta^2 > 0.14$.
3. The effect size is considered large if $\eta^2 > 0.14$.

In relation to the second dimension, it is evident that there are statistically significant differences at a level of (0.05) between the means of the rank scores of individuals in the experimental and control groups in the dimensional measurement of 'workload burden' among nurses in Riyadh city, attributed to the use of an electronic counseling program based on Lazarus theory, using some applications of artificial intelligence. The differences favored the experimental group with an average of (6.70), where ($z=12.000$, $p=.004$).

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "workload" using η^2 . The finding demonstrated that the effect size in workload was (0.44), which is a very large effect size.

Regarding the third dimension, the availability of statistically significant differences was demonstrated, at the level of (0.05) between the mean score ranks of the individuals of the experimental and control groups in the pre- investigation and post- investigation measurement on the scale of "professional communication with nurses and doctors" among nurses in Riyadh city, due to utilizing an electronic guidance program based on Lazarus theory using some artificial intelligence applications. The differences were in favor of the experimental group with an average of (7.95), where ($z=24.500$, $p=.053$).

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "professional communication with nurses and doctors" using η^2 . The finding demonstrated that the effect size in professional communication with nurses and doctors was (0.20), which is a very large effect size.

Regarding the total grade of the scale, the availability of statistically significant differences was demonstrated, at the level of (0.05) between the mean score ranks of the individuals of the experimental and control groups in the post- investigation measurement on the scale of "psychological stress" among nurses in Riyadh city, due to utilizing an electronic guidance program based on Lazarus theory using some artificial intelligence applications. The differences were in favor of the experimental group with an average of (6.05), where ($z=5.500$, $p=.001$)

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "psychological stress" using η^2 . The finding demonstrated that the effect size in psychological stress was (0.60), which is a very large effect size. This finding is consistent with the finding of some previous studies that concluded to the availability of an effect of the electronic guidance program on the experimental group. This was concluded in the study by (Beverly et al. (2022); Fiol-Deroque et al. (2021); and Veling et al, 2021), which proved the effectiveness of using artificial intelligence applications in decreasing psychological stress.

The effectiveness of the program that was implemented to the experimental group's members was due to its guidance sessions which included activities of multiple skills derived from the confronting styles stated by Lazarus (Lazarus, 1984), which decrease the level of psychological stress among nurses. It included activities such as

Cognitive restructuring, which contributed to optimize the participants' capability to attention and perception of their thoughts, their impact on their emotions, their association with events, and how they interpret them, therefore, optimizing their capability to evaluate stressful situations and events, whether it is stressful or not.

It also included activities to raise their self-awareness, through recognizing the participants to their strengths and weaknesses and how to improve and develop them to the maximum extent possible. These activities contributed to developing their self- confidence and capabilities. The guidance sessions included social skills and effective communication activities as well. These activities contributed to achieving social growth by developing the participants' capability to communicate properly with others and express their feelings. This in turn helped them to establish close relationships with others, enhance their status and value, and improve their self-esteem and belonging to the group, to help them to evaluate themselves according to their capabilities and potential properly, and thus reduce their level of psychological stress. This finding conforms with the study by Sasaki et al. (2021), which proved the effectiveness of programs of smartphone-based stress management in improving participation and communication among nurses in Vietnam.

One of the techniques that acted an effective role in realizing the objectives of the program was the relaxation technique. it is deemed as one of the emotion-focused confronting methods stated by Lazarus (1984), which objectivizes to change the emotional state that the individual feels as a finding of psychological stress. Relaxation works to harmonize the body with the mind and soul, and to create a state of calm, peace, and inner peace for the individual. This contributed to decrease the physiological symptoms such as elevating heart rate, stutter, shudder, and dry mouth. This was achieved through the performance of certain practices and behaviors. The participants manifested a positive interaction with this technique through training on proper breathing exercises. The participants expressed how relaxation helped them to control their emotions and decrease the stress and strain they feel in stressful situations and events. A smartphone application that contains clips of different relaxation exercises was utilized to achieve that. This finding confronts with the findings of the study by (Veiling et al, 2021 and Villani et al, 2013), which proved the effectiveness of relaxation in decreasing the level of psychological stress.

The technique of self-dialogue contributed to developing positivity within them and raised their self-confidence and capabilities to confronting stressful events and situations that lead to psychological stress. It was achieved through the constant recurrence of positive statements at different times during the training sessions and homework. The self-dialogue technique also helped participants to develop adaptive skills. Whereas talking the participants to themselves with motivating and encouraging statements while they are under a stressful situation influence, it helps them to develop their capacity to endure more difficult situations and events in the future.

The dependency of the sessions upon homework which acted an active role in raising the effectiveness of this program also helped in achieving this finding, since it is the only commencement and conclusion technique of each guidance session. Homework also contributed to determine the level of

intimacy and cooperation between the participants and the counselor. The participants were assigned homework that helped them to detect some of the cognitive factors related to the problem. They were also asked to perform specific behaviors such as recognizing and classifying thoughts, that helped to understand the problem in more explicit and specific way. Beck has demonstrated that homework helped individuals to examine and measure their beliefs in different everyday life situations. (Kory 2013, p. 378).

The sessions also depended upon humor and fun, which acted a positive role in achieving the effectiveness of the program. It was achieved through put participants at ease and reassurance, which made them able to talk calmly and deal with themselves in a less serious manner. Moreover, it helps to detect the ridiculousness of some thoughts in which some participants believe, and the exaggeration of these thoughts that lead to feelings of psychological stress. Therefore, it helps to decrease the severity of stress and anxiety that they feel. Albert Ellis stated that humor has cognitive and emotional benefits in terms of achieving change in individuals. It helps them to be more able to think logically. (Abu Asaad and Arabiyat, 2012, p. 212).

The findings of the second hypothesis, which states that "there are statistically significant differences between the mean score ranks of the individuals of the experimental group in the pre-investigation and post-investigation measurement on the psychological stress scale among nurses in Riyadh city due to utilizing an electronic guidance program based on Lazarus' theory using some artificial intelligence applications."

To verify the validity of the hypothesis, the Wilcoxon test was used to verify the differences between the mean ranks of the scores of the individuals of the experimental group in the pre-investigation and post- investigation on the psychological stress scale among nurses in Riyadh city. It is illustrated by following table:

Table 7: Wilcoxon findings for two Correlated Samples to Identify the Significance of the Differences Between the Mean Score Ranks of the Experimental Group in the Pre-investigation and Post- investigation on the Psychological Stress Scale among Nurses in Riyadh City

Dimensions	Measurement	No	Mean ranks	Total ranks	"Z" value	Significance level	Effect size
professional and emotional interaction	Experimental pre-investigation (negative ranks)	9	5.00	45.00	-2.670	0.008	0.71
	Experimental post-investigation (positive ranks)	0	0.00	0.00			
	Null ranks	1	-	-			
Workload	Experimental pre-investigation (negative ranks)	9	5.00	45.00	-2.666	0.008	0.71
	Experimental post-investigation (positive ranks)	0	0.00	0.00			
	Null ranks	1	-	-			
Professional communication	Experimental pre-investigation (negative ranks)	9	5.94	53.50	-2.652	0.008	0.70
	Experimental post-investigation (positive ranks)	1	1.50	1.50			
	Null ranks	0	-	-			
Scale psychological stress	Experimental pre-investigation (negative ranks)	10	5.50	55.00	-2.805	0.005	0.79
	Experimental post-investigation (positive ranks)	0	0.00	0.00			
	Null ranks	0	-	-			

The previous table illustrates, regarding the first dimension, "the availability of statistically significant differences at the 0.01 level between the mean score ranks of the individuals of the experimental group in the pre-investigation and post- investigation on the dimension of "professional and emotional interaction with patients" among nurses in Riyadh city due to the use of an electronic guidance program based on Lazarus theory using some artificial intelligence applications. The differences were in favor of the post-investigation with an average of (0.00), where (z=-2.670, p=.008).

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "professional and emotional interaction with patients" using (d) of Cohen. The finding demonstrated that the effect size in professional and emotional interaction with patients was (0.71), which is a medium effect size according to Cohen's criterion, which calculated using the following equation:

$$n^2 = \frac{Z^2}{N(k-1)}$$

The levels of effect size related to the value of (d) are identified and divided into three levels:

- 1- The effect size is small if $0.2 > 0.5 > d$
- 2- The effect size is medium if $0.5 > 0.8 > d$
- 3- The effect size is large if $0.8 > d$

Regarding the second dimension, the availability of statistically significant differences at the level of (0.01) between the mean scores of the individuals of the experimental group in the pre-investigation and post- investigation on the dimension of "workload" among nurses in Riyadh city due to the use of an electronic guidance program based on Lazarus theory, using some artificial intelligence applications. The differences were in favor of the pre- investigation with an average of (0.00), where ($z=-2.666$, $p=.008$).

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "workload" using (d) of Cohen. The finding demonstrated that the effect size in workload was (0.71), which is a medium effect size according to Cohen's criterion.

Regarding the third dimension, the availability of statistically significant differences was demonstrated, at the level of (0.01) between the mean score ranks of the individuals of the experimental group in the post- investigation measurement on the scale of "professional communication with nurses and doctors" among nurses in Riyadh city, due to utilizing an electronic guidance program based on Lazarus theory using some artificial intelligence applications. The differences were in favor of the post - investigation with an average of (1.50), where ($z=-2.652$, $p=.008$).

Therefore, we accept the alternative hypothesis, which states the availability of statistically significant differences between the mean score ranks of the individuals of the experimental group in the pre-test and post-test at the significance level of (0.01), and we reject the null hypothesis.

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "professional communication with nurses and doctors" using (d) of Cohen. The finding demonstrated that the effect size in professional and emotional interaction with patients was (0.70), which is a medium effect size according to Cohen's criterion, which calculated using the following equation:

$$n^2 = \frac{Z^2}{N(k-1)}$$

Regarding total score of the scale, the availability of statistically significant differences was demonstrated, at the level of (0.01) between the mean score ranks of the individuals of the

experimental group in the pre- investigation and post- investigation measurement on the scale of " psychological stress " among nurses in Riyadh city, due to utilizing an electronic guidance program based on Lazarus theory using some artificial intelligence applications. The differences were in favor of the post- investigation application with an average of (0.00), where ($z=-2.805$, $p=.005$).

After ensuring the availability of statistically significant differences, the effect size of using an electronic guidance program based on the Lazarus theory, utilizing some artificial intelligence applications among nurses was calculated. It was utilized as an independent variable on the dependent variable "psychological stress" using (d) of Cohen. The finding demonstrated that the effect size in psychological stress was (0.79), which is a large effect size according to Cohen's criterion.

The success of the electronic guidance program in the study may be refer to its use of educational aspects. For the purpose of enhancing knowledge of psychological stress disorder, through ask the participants to read the scientific material in the smartphone application. The material contains information related to psychological stress, such as its causes, types, factors that lead to its occurrence, and other factors. This contributed to understanding the participants of the problem from which they were explicitly suffering.

Providing electronic guidance services to nurses via Zoom gave the participants an opportunity to express themselves freely about how they feel. It also contributed to creating an atmosphere of intimacy and cooperation among them, as well as the ease of attending guidance sessions from their homes, in addition to flexibility in terms of time. This reflected positively on the participants during the program, and is one of the advantages of electronic guidance. It confronts with what was mentioned by (Al-Shalan, 2013) that flexibility in dealing outside working hours is one of the advantages of electronic guidance. The smartphone application, with its homework and activities to be implemented through it, contributed to the interaction of the participants, as they expressed their ease of using the application and it saved them a lot of time and effort. This confronts with the findings of studies by (Fiol-Deroque et al., 2021; Santakar et al., 2022; Sasaki et al., 2021) which have proven the effectiveness of using smartphones in decreasing the level of psychological stress. The findings of the current study confront as well with the findings of studies by (Henshall et al., 2023; Gbeddy, 2021; Sasaki et al., 2021 and Veiling et al., 2021) that have proven in general the effectiveness of electronic guidance and therapy in relief the symptoms of a wide range of psychological and behavioral disorders such as anxiety, depression, panic disorder, and post-traumatic stress disorder. In conclusion, it can be said that electronic guidance using some artificial intelligence applications (smartphone application) which was used in the current study including activities, methods, and homework, has proven its effectiveness in decreasing the level of psychological stress among participants in a statistically significant manner. This emphasized the need of nurses in particular for such programs to relief the feeling of psychological stress; as a result of the events and stressful situations they face on a daily basis.

Recommendations of the study:

In summary, the study concluded to the following recommendations:

1. Paying attention to labors in nursing profession in terms of providing them with all preventive and therapeutic programs that help them confront the psychological stress and relief psychological stress.
2. It is essential to provide different electronic guidance services, including smartphone applications, that target labors in nursing profession, as they help them overcome stressful situations and events through utilizing psychological methods and techniques that help relief the psychological stress.
3. The competent authorities in the Saudi Ministry of Health shall organize courses and workshops to raise awareness of the hazards of psychological stress and how to cope with it by providing information and knowledge related to psychological stress to labors in nursing profession.

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