▪*Basic Research*

Benefits and Barriers to Telehealth Utilization Perceived by Nursing Academic Staff and Care Providers in Egypt: A Mixed-Method Cross-Sectional Study

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Background: Telehealth refers to the delivery of medical care or services from a distance rather than in person. According to Global Market Insights, the global telehealth market was estimated to be worth $56 billion in 2020. **Aim**: The purpose of this research was to analyze the perceptions of nursing academic staff and care providers about the benefits and barriers to the use of telehealth. **Design**: Concurrent mixed-method (quantitative-qualitative) design was implemented using an online cross-sectional survey. **Sample**: A prospective sample (788 nursing academic faculty and 794 nursing care providers) was recruited. **Tools**: **(1):** Questionnaires to assess sociodemographic and perception of telehealth. **(2):** The benefits and barriers to telehealth utilization were qualitatively assessed. **Results:** The mean scores of participants' perceptions of telehealth were positive (nursing academic faculty group: 54.25±13.78; nursing care providers group: 50.43±15.92). In terms of the usefulness of telehealth in providing health care to rural locations, the views of both groups were 98.4% and 86.2%, respectively. However, the main barrier was the lack of telehealth instruction in academic nursing curricula (75.4%). Telehealth was positively perceived by academic nursing faculty and care providers. **Conclusion:** Their perceptions on the benefits of telehealth focused on the development of new job descriptions and classifications, the effectiveness of disaster relief, access to healthcare for people living in remote places, and client support through reduced anxiety. On the contrary, the scarcity of personnel from the specialized health team, educational barriers, and technological issues were the main barriers. **Recommendations:** Incorporating telehealth into the academic program for nursing students and providing relevant techniques for use in capstone projects.

Keywords: Barriers; benefits; healthcare technology; nursing staff; perception; telehealth

Introduction:

Telehealth refers to the electronic delivery of medical treatment or services from a distance, replacing in-person office visits. It also refers to the use of information technology to provide nursing services and care via electronic platforms, such as video conferencing, phone conversations, and various electronic devices used for remote patient monitoring. In addition, telehealth offers health education programs, ongoing remote monitoring of vital signs, such as blood pressure or ECG, and, when necessary, remote consultations with physicians or nurses **(Gajarawala et al., 2021)**. According to Global Market Insights, the worldwide telehealth market was valued at $56 billion in 2020. This is expected to increase at a compound annual growth rate (CAGR) of more than 30% between 2021 and 2030 **(Mohammed & El-sol, 2020)**.

In Europe, four out of every ten employees adopted teleworking based on global social distancing strategies. Furthermore, to address the workforce shortage, members of the health team, particularly nurses, began to embrace telehealth. Other forms of telework, such as mobile health and monitoring, have begun to emerge **(National Association of Community Health Centers, 2020).** Teleworking increased by 40% to 60% in the countries most affected by the coronavirus and based on how-well developed teleworking was prior to the pandemic, such as Finland, Luxembourg, the Netherlands, Belgium, Denmark, Ireland, Italy, Austria, and Sweden **(Eurostat, 2022)**. Furthermore, Japan has implemented telehealth through the use of cutting-edge artificial intelligence and robotic systems **(Japan Cabinet Office, 2021)**.

During the COVID-19 epidemic, the Middle East and Arab nations have used telemedicine, but with varying healthcare systems based on their financial capabilities. For long-term provision of healthcare services, the healthcare delivery system in the United Arab Emirates built telematics and telemedicine applications in 50% of hospitals. About 90% of their physicians and nurses used cellphones and apps for health care. Using cutting-edge technology, telehealth was implemented in Egypt, improving the health care system by reducing patient wait times, increasing the effectiveness of healthcare, and reducing staff workload. As a result, the number of patients visiting various outpatient clinics decreased to 50%, particularly in family medicine clinics **(Alboraie et al., 2021)**.

Remote service delivery, cost effectiveness for clients, patient comfort and safety, greater prospects for healthcare employment, development of nursing research, and improved bed allocation are the key advantages of telehealth services. Telehealth has

benefits and drawbacks for both patients and professionals. However, their downsides include patient privacy, computer faults, insufficient assessment, and physical resistance. Although there are certain drawbacks to telehealth from the patient's point of view, it is here to stay and it is time for people to accept it as a new way of providing care to patients (**Dalley, Rahman & Ivaldi, 2021).**

There are numerous barriers to telemedicine adoption, and adoption failure is a serious issue that must be recognized and investigated. Approximately 75% of telemedicine programs are abandoned or have completely failed, and this proportion rises to 90% in developing countries **(Bali, 2018)**. The following are some of the current barriers to telehealth: limited high-speed broadband computer network; lack of support and unwillingness to change to rely on technology; inadequate patient agreement and abilities; costs are higher in some districts and among people with low socioeconomic status, and provider skills and competencies are insufficient **(Bahl et al., 2020)**. As is the case with telemedicine, it is also surrounded by legal, ethical, and regulatory issues. Legal difficulties such as malpractice, negligence, and accountability are also common and difficult to address **(Abdel-Hafez, 2020).**

Significance of the study:

Governments are making significant efforts to build telemedicine networks that span national borders to minimize hospital pressure, patient suffering, need for transportation, hospital fear, and save the general public time and money. It will also improve service quality and build trust among patients. The digital health sector is bringing telehealth innovations to market, resulting in new efficiency paradigms in healthcare coordination. The concept of remote care expands easily to incorporate care coordination by integrating digital and virtual care **(Abdel-Hafez, 2020).**

The industrialized nations that continue to lead the field - the United States, Canada, and the United Kingdom - are the primary focus of current significant nursing research studies on telenursing. The primary conclusions of those important telenursing studies suggest a positive and significant correlation between the degree of telenursing development and the degrees of technical advancement in various nations. Numerous telenursing studies conducted in these affluent nations have demonstrated the viability and great benefits of telenursing integration into the core of healthcare delivery systems. The majority of the suggestions made in most recent telenursing research publications focus on the necessity of directing future research efforts toward theory-driven communication

studies in order to develop an efficient telenursing process. Furthermore, the management structure of telenursing needs to be improved by policymakers and telenursing managers **(Mohammed & El-sol, 2020)**.

The American Telemedicine Association estimates that telemedicine could handle 50% of all medical services. At least, 1.1 million registered nurses are required to meet the demands of healthcare systems and strike a balance between the workforce of health team and quality of service **(Attia Abdallah et al., 2024)**. Some nurses lack the necessary training to follow telemedicine techniques. Nursing programs have the ability to assess the needs of nursing students, emphasizing the need for additional training to support the standard of care and helping them follow the trend of advances that have been noted. Therefore, educational nursing institutions should be required to incorporate telehealth into nursing curricula **(American Association of Colleges of Nursing, 2020)**.

Aim of the study:

The study aimed to evaluate the perception of nursing academic staff and care providers regarding telehealth utilization and related benefits and barriers. It can be achieved through the following:
- Assessing telehealth perception among nursing academic staff and care providers.
- Evaluating the benefits and barriers to telehealth utilization in Egypt.
- Comparing telehealth' perception scores according to sociodemographic characteristics.

Research questions:

In order to achieve the objective of this study, the following questions were discussed:
- What is the level of telehealth perception among nursing academic staff and care providers?
- What are the opinions of nursing academic staff and care providers regarding benefits and barriers to telehealth utilization in Egypt?

Subjects and Methods:
Research design:
Concurrent mixed-method (quantitative-qualitative-research) design was applied using a cross-sectional online survey. The study examined the knowledge of both nursing academic staff and nursing care providers and the aspects of implementing telehealth as benefits and barriers.

Cross-sectional mixed methods design was utilized to investigate the different health-related issues related to telehealth across Egypt. The cross-sectional mixed methods are well suited for examining studies that cross different sections by combining quantitative and qualitative approaches to make inferences about a population of interest (health care providers) at one point in time (as implementation of telehealth program allover Egypt as one health care improvement program).

Mixed methods study design was adopted, as demonstrated in **Figure 1**, to systematically understand the health care provider and academic staff' perception regarding the telehealth and qualitative about befits and barriers of implantation telehealth in Egypt. The study was characterized by four phases: In the first phase, the qualitative and quantitative data were concurrently collected. The second phase of this study involved analyzing the quantitative datasets independently from the qualitative datasets. Following that, integrated the generated information, comparing and relating findings from the independent parallel analyses. The information integration, which is expected to raise the validity of the study's findings, relied on joint model analysis **(Fetters, 2019)**. The interpretation of the integrated information led to the generation of perception/knowledge, which constituted the last phase of the research design.

Figure 1. Phases of telehealth mixed method research design for data collection and analysis.
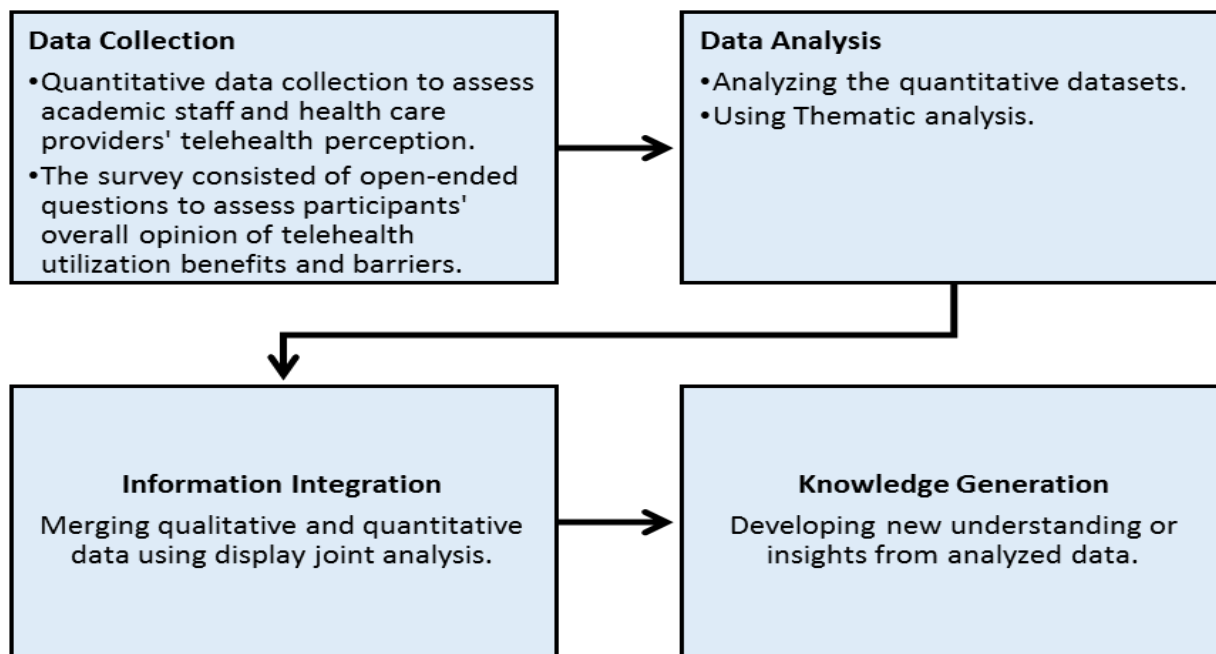
Research setting and Sample:

A purposive sampling technique was used. In the context of this study, "nursing care providers" were general nursing staff and nurses who would use telehealth and train students on its technology in hospitals and health care centers throughout Egypt.

Following ethical approval, participants were invited to participate in this study using a Google form survey link. After analyzing eligibility criteria, the study consisted of 1,582 participants from all over Egypt, including (788) academic personnel from various universities and (794) nursing care providers. They all participated in the quantitative and qualitative study instruments by completing Tools I and II, respectively.

In this study, we have the following eligibility criteria: (1) Any licensed nursing personnel, such as the nursing director, nursing supervisor, head nurse, staff nurse, infection control nurse, quality assurance nurse, and nurse specialist, for continuing education; (2) all academic nursing staff involved in clinical settings; and (3) unlimited years of work experience for both groups.

The sample size was estimated using the formula developed by *Charan and Biswas* (**Charan & Biswas, 2013**), as shown below, with the level of significance of 5% and power of study of 95%, where Z1-α/2 (the standard normal variate) of 1.96, SD (standard deviation) of the variable, and d for absolute error or precision.

$$n = \frac{(Z1-\alpha/2)^2 . SD^2}{d^2}$$

Tools of data collection:

In addition to the sociodemographic data of the participants, two tools were used in this study. Both Telehealth Perception Assessment Questionnaire (**Ashfaq et al., 2020**) and Benefits and Barriers of Telehealth Survey (**Lin & Dievler, 2018**) & (**Gajarawala, Pelkowski, 2021**) were used.

Tool I: Telehealth Perception Assessment Questionnaire:

It was developed by **Ashfaq et al. (2020)**. There were 15 statements on a 5-point Likert scale that asked about several aspects of telehealth, including concepts and facts, methods of telehealth, telehealth patterns, advantages, and disadvantages of telehealth. The questionnaire was scored out of five, with five representing the greatest point and one representing the lowest. The total telehealth perception score was calculated by adding the

scores for each domain. The total perception score was either Unsatisfactory <60% or Satisfactory >60%.

The reliability of the questionnaire was examined. The Cronbach's alpha scores were:

Telehealth Perception Domain	Cronbach alpha
Concept and facts	.859
Methods of telehealth	.890
Telehealth patterns	.889
Telehealth advantages	.872
Telehealth disadvantages	.933
Total Telehealth Perception	.858

Tool II: Benefits and Barriers of the Telehealth Survey:
The survey was developed by researcher based on (**Lin et al., 2018**; **Ruda et al., 2023; Al-Sharif et al., 2021 and Gajarawala and Pelkowski, 2021**) to ensure construct validity of the instrument. Further, the survey was evaluated by 6 experts to assure both its face and content validity. It consisted of 16 open-ended questions to assess participants' overall opinion of telehealth utilization benefits and barriers; it consists of two parts:

Part A: The survey questionnaire on telehealth benefits involved eight open online questions related to aspects of remote service delivery, financial savings for clients and organizations, improved bed allocation, patient/client comfort, opportunities of healthcare employment, remote areas accessibility by patient/client and health team, telehealth advances safety in healthcare system and developing in nursing research.

Part B: The survey questionnaire on telehealth barriers involved eight open-ended online questions related to aspects of regularity barriers, technical barriers, workload and time barriers, educational barriers, legal barriers, ethical barriers, human resources barriers, and change agents' barriers.

Ethical considerations:

The Ethics Review Board of the Faculty of Nursing, MTI University, approved this study by number (FAN/66/2023). Participants consented to participate voluntarily in the study. Before the research, all possible participants were informed about the purpose of the study and were given the option of fully participating or withdrawing at any moment. Participants were also notified that their responses would be handled anonymously,

securely stored, and utilized only for research reasons. No personally identifiable data has been collected.

Data collection technique:

The study involved voluntary recruitment of participants via social media platforms, including university, hospital, and health care electronic Web sites, scientific and professional WhatsApp groups, and health providers' Facebook pages. The data were collected between March and May of 2023, utilizing this Web-based surveying platform: (https://forms.gle/sXpNmAgHzx6hmFPz5)

Statistical Analysis:

The researchers performed statistical modeling to identify the level of perception of telehealth of nursing academic staff and care providers, as well as a qualitative analysis to examine the benefits and barriers of telehealth utilization. Data were cleaned and processed using SPSS version 28.

First, these descriptive analyzes were calculated: frequency, percentages, mean, and standard deviation (SD). The independent sample *t*-test was used to compare the mean score of perception domains for the two sample groups (nursing academic staff and care providers). A simple linear regression model was used to investigate the relationship between the degree of telehealth perception and sociodemographic data, as well as to assess the factors influencing its level. For all statistical tests conducted, a level of significance of 0.05 was chosen.

Subsequently, the qualitative responses from the survey were entered and analyzed using the NVivo 14 program. Thematic analyses were run on the coded qualitative data, based on the analytical themes discovered in the coding structure. Descriptive codes were added to the data and then combined to form categories.

Results:

Study covers several of results and a variety of dimensions, but we deliberate on the results that are related to variables of the study as follow:

Table 1: The mean age of care providers and academic nursing staff was 32.43±8.53 and 39.41±7.31, respectively, while the median age was 40.45 and 31.83. Sixty-two percent of academic staff members were women, whereas 45.3% of caregivers were. Around 70% of those in both groups worked for the government. In the care provider group, 61.7% had insufficient income and 45.3% had additional jobs, compared to 55.3% and 34.4% in the

academic staff group. With 39.6% and 43.8%, respectively, the two groups' work was geographically distributed in Cairo and Delta Region. Academic staff had a higher level of education than care providers, 40.0% of them being lecturers. Nursing specialists made up 47.2% of the care providers group.

Table 2: Showed a positive mean score of telehealth perception of nursing academic staff and care providers in all classifications, with a total score of (54.25 ± 13.78 and 50.43 ± 15.92). Additionally, at $p < 0.001$, there were highly statistical significant differences between all classifications of perception of telehealth score for the two groups.

Nursing academic staff and care providers' opinions regarding benefits of telehealth:

Figure 2: Showed that telehealth benefits could provide financial savings for health organizations. It was the two groups' point of view by 81.4% the nursing academic staff and 79.6% of care providers.

Figure 3: Described 98.4% vs 87.45 % of the nursing academic staff and care providers' opinion regarding good reaching of health services for remote areas. Also their opinion regarding effective contact with health team members expressed 86.2% and 88.1% respectively.

Figure 4: Clarified 80.7% of the nursing academic staff opinion regarding remote service delivery benefits of telehealth, saving time, effort and cost of transportation; compared by 76.7% for care providers. In addition to their opinion in providing accessibility of health services were 53.0% vs 54.9% respectively.

Figure 5: Displayed that 87.4% of the nursing academic staff and 81.7% of the care providers expressed that telehealth benefits could decrease the hospital waiting list and also bed allocation by 84.5% vs 84.2%, respectively. In addition to decreasing the length of hospitalization by 82.4% and 70.6% for both groups.

Figure 6: Summarized the perceptions of care providers and nursing academic staff on the contribution of telehealth benefit to the comfort of patients and customers with medical services. Compared to care providers, academic staff reported that telehealth supports clients (86.4% vs. 82.7%) and minimizes related anxiety (84.2% vs. 80.9%). Furthermore, 65.8% of academic staff and 69.4% of care providers agreed that telehealth was beneficial to vulnerable populations such as elderly people, children, the disabled, postpartum mothers, clients with mental problems, and others.

Figure 7: Showed 89.6% of healthcare professionals and 92.7% of academic nursing staff believed that telehealth may help create new job classifications and descriptions. They also agree that telehealth helps to strengthen health informatics and increase the number of health technology professionals by 72.8% vs 65.5% and 80.6% vs 78.4%, respectively.

Figure 8: Indicated that telehealth benefits were included effective multidisciplinary healthcare system as the nursing academic staff point of view by 75.4% and 76.8% for care providers. Also they commented on telehealth effectiveness in case of health disasters through 61.4% vs 75.4% for both of them respectively.

Figure 9: Revealed that telehealth benefits including sufficient data base and easy data collection as 82.6% of the academic staff opinion and 79.3% of care providers' opinion. Also, they expressed 78.6% vs 72.8% regarding role of telehealth in healthcare improvement and health indicators through 72.8% for academic staff and 63.7% for care providers.

Table 3 categorized qualitatively the barriers to telehealth application from the perspective of nursing academic staff and care providers. They cited technical barriers such as the lack of smart technology gadgets for impoverished patients/clients and the insufficient Internet access of 80.7% and 78.7% of academic staff, respectively, and 76.7% and 75.2% of care providers. In terms of human resource barriers, 77.0% of care providers reported a complete lack of members of the health team. Furthermore, both groups mentioned the high cost of the telehealth system as a major barrier (65.6% & 75.8%). In terms of educational barriers, 75.4% of academic staff and 64.2% of care providers indicated that insufficient telehealth teaching in health school programs was an important barrier.

Table 4 showed the linear regression model a non-significant correlation between the total telehealth perception score of nursing academic staff and other characteristics.

Table 5 clarified the regression model about 0.4% of the factors (predictors) that affect the total telehealth perception score of academic staff. On the other hand, a highly significant correlation between the total telehealth perception score of care providers and their residence. The regression model explains 2.9% of the factors (predictors) that affect the total telehealth perception score of academic staff.
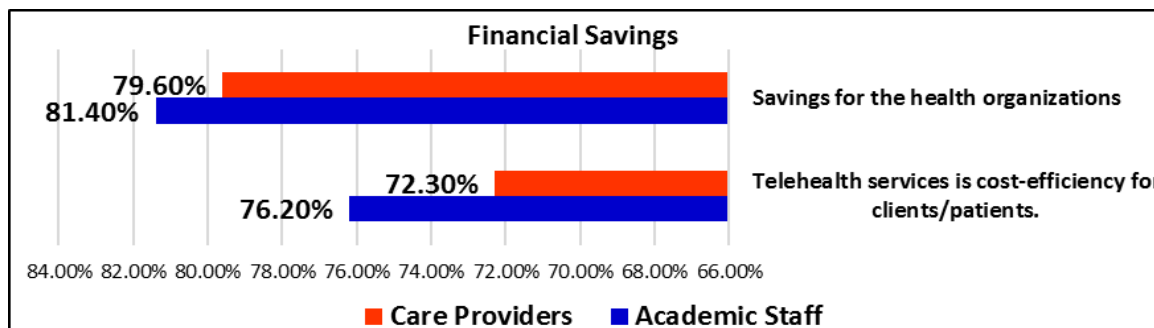
Table 1. **Distribution of nursing academic staff and care providers according to sociodemographic characteristics (n=1582):**

| Sociodemographic data	Academic Staff (N=788)		Care Providers (N=794)	
	N	%	N	%
Age (years): Mean±SD	39.41±7.31		32.43±8.53	
Median	40.45		31.83	
Sex:				
- Male	314	39.8	434	54.7
- Female	474	60.2	360	45.3
Work Affiliation:				
- Governmental	557	70.7	561	70.7
- Private/national	231	29.3	233	29.3
Income:				
- Enough and save	116	14.7	101	12.7
- Just enough	244	30.0	203	25.6
- Not enough	428	55.3	490	61.7
Additional work	271	34.4	360	45.3
Residence:				
- Rural	273	34.6	274	34.5
- Urban	515	65.4	520	65.5
Main Work by Geographical Regions:	University		Hospital	
- Northern Coast Region	145	18.4	137	17.3
- Cairo & Delta Region	312	39.6	348	43.8
- Northern Upper Egypt Region	83	10.5	78	9.8
- Southern Upper Egypt Region	59	7.5	66	8.3
- Canal Region (Eastern Coast Region)	96	12.2	84	10.6
- Highlands Region (Sinai)	33	4.2	17	2.1
- Desert Region	12	1.5	11	1.4
- South Egypt Region	48	6.1	53	6.7
Academic degree:				
- Professor/Associate Professor	72	9.1		
- Assistant Professor	100	12.7		
- Lecturer	315	40.0		
- Assistant Lecturer	200	25.4		
- Demonstrator	86	12.8		
Hospital position:			218	27.5
- Nursing Director/Supervisor/Head nurse			375	47.2
- Nursing Specialist			86	10.8
- Quality assurance/Infection Control Nursing				
- Nursing Research/Informatics			43	5.4
- Nursing Education			72	9.1

Table 2. Distribution of nursing academic staff and care providers according to their perception regarding telehealth:

| Telehealth perception Classification	Academic Staff Mean±SD	Care Providers Mean±SD	t	p
- History & concept of telehealth	11.07±2.06	8.89±1.98	3.604	.000
- Methods of telehealth	9.22±1.81	11.43±3.04	3.622	.000
- Telehealth patterns(examples)	10.76±1.93	10.96±2.89	3.817	.000
- Importance/Advantages of telehealth	12.04±2.09	10.96±2.89	2.459	.000
- Disadvantages of telehealth	11.16±2.18	8.19±1.76	4.094	.000
Total perception Score Level	54.25±13.78	50.43±15.92	5.108	.000

Figure 2: Comparative qualitative distribution of nursing academic staff and care providers regarding the financial savings' benefits:
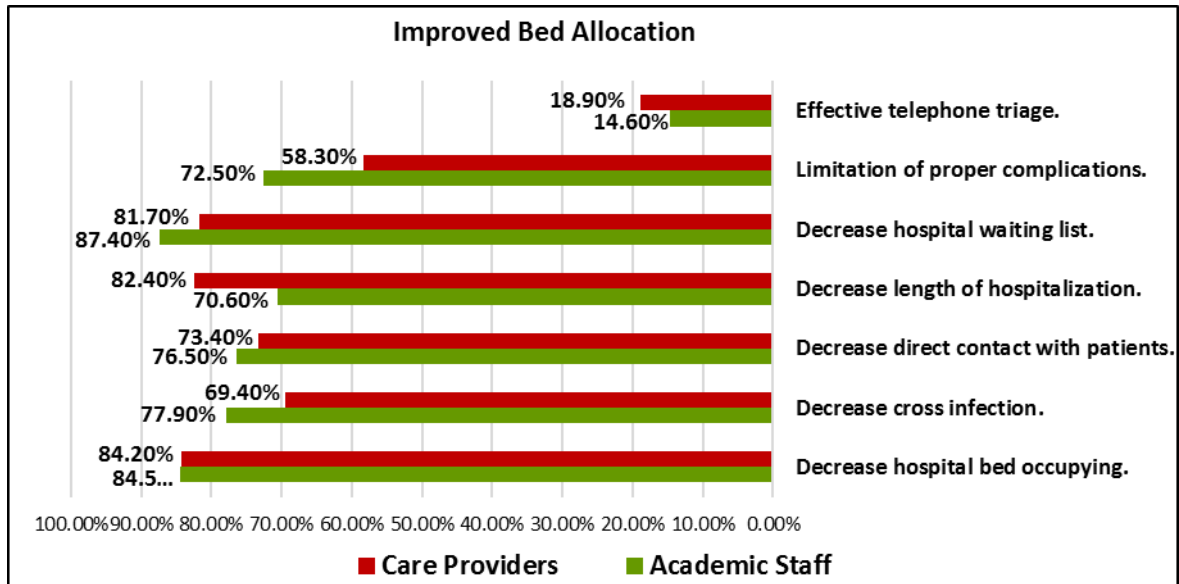

Figure 3: Comparative qualitative distribution of nursing academic staff and care providers regarding remote area accessibility by clients and health team:
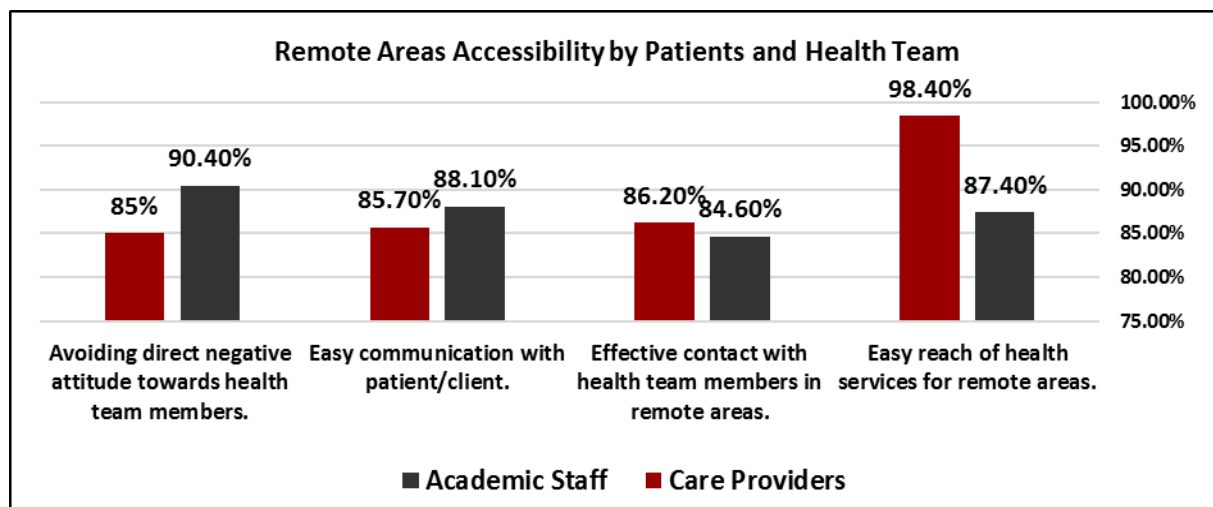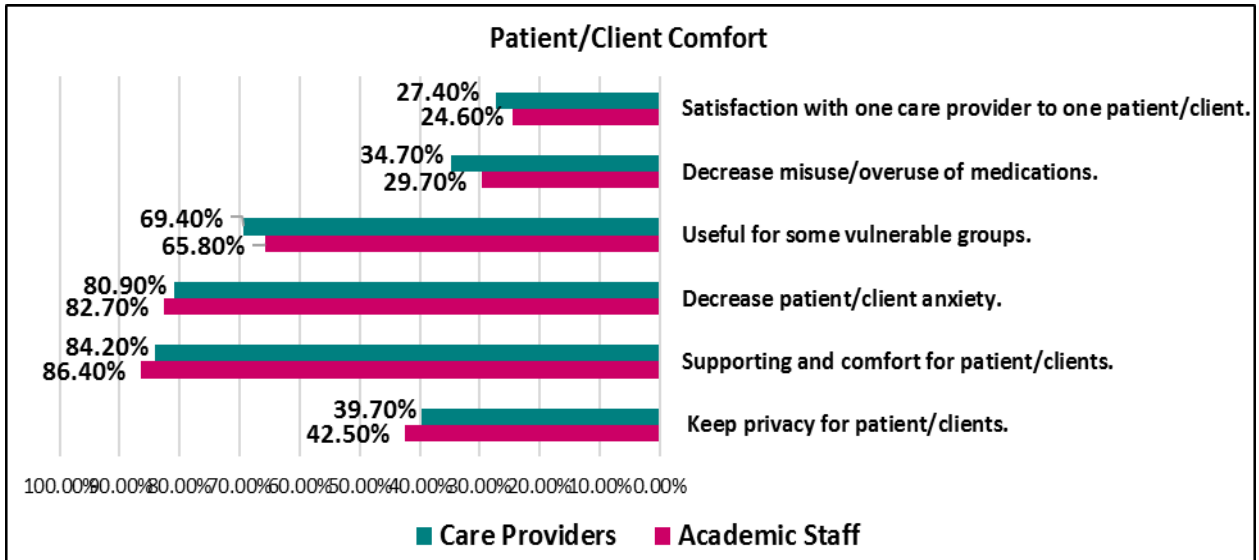
Figure 4: Comparative qualitative distribution of nursing academic staff and care providers regarding remote service delivery benefits:
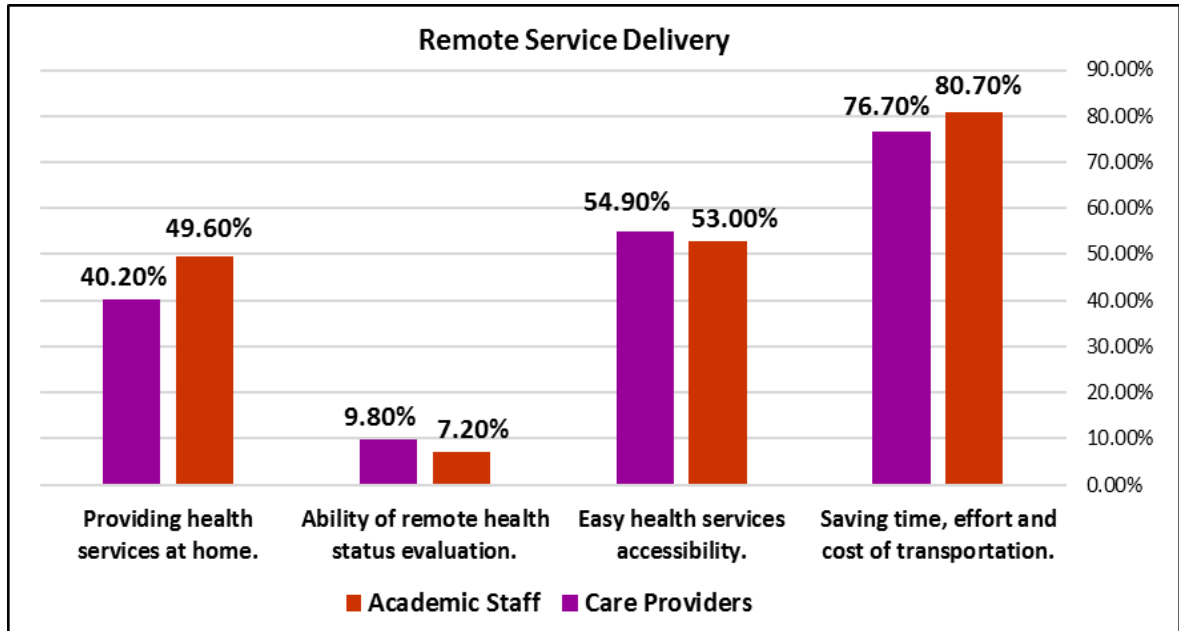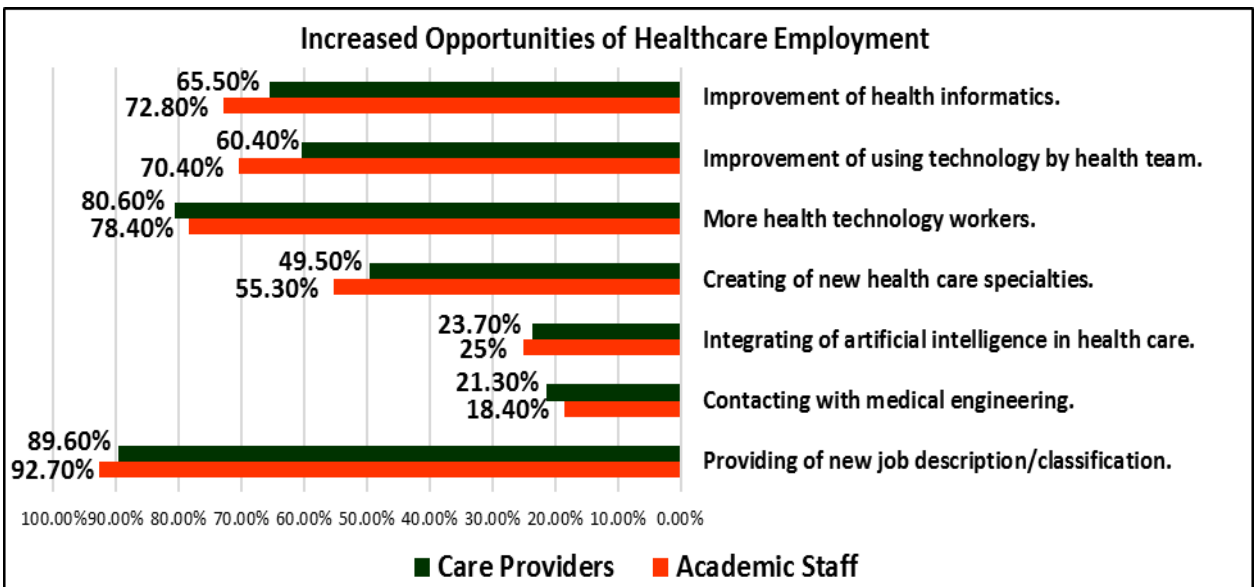

Figure 5: Comparative qualitative distribution of nursing academic staff and care providers regarding improved bed allocation benefits:
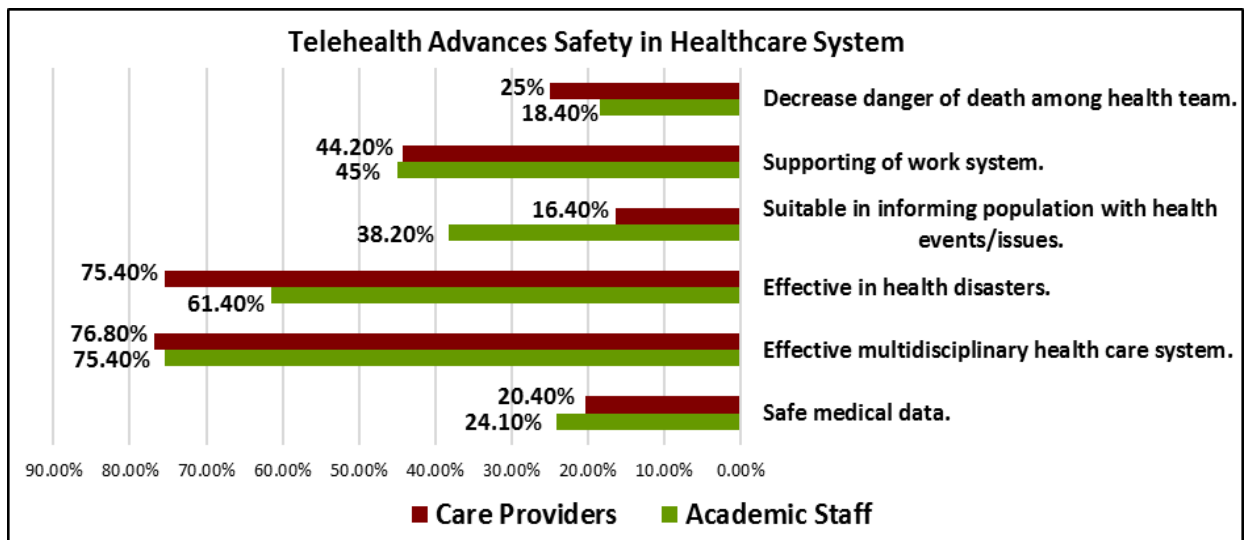
Figure 6: Comparative qualitative distribution of nursing academic staff and care providers regarding the clients'/patients' comfortability:


Figure 7: Comparative qualitative distribution of nursing academic staff and care providers regarding increasing of opportunities of healthcare employment:

Figure 8: Comparative qualitative distribution of nursing academic staff and care providers regarding advancing safety in healthcare system:

Figure 9: Comparative qualitative distribution of nursing academic staff and care providers regarding telehealth developing in nursing research:
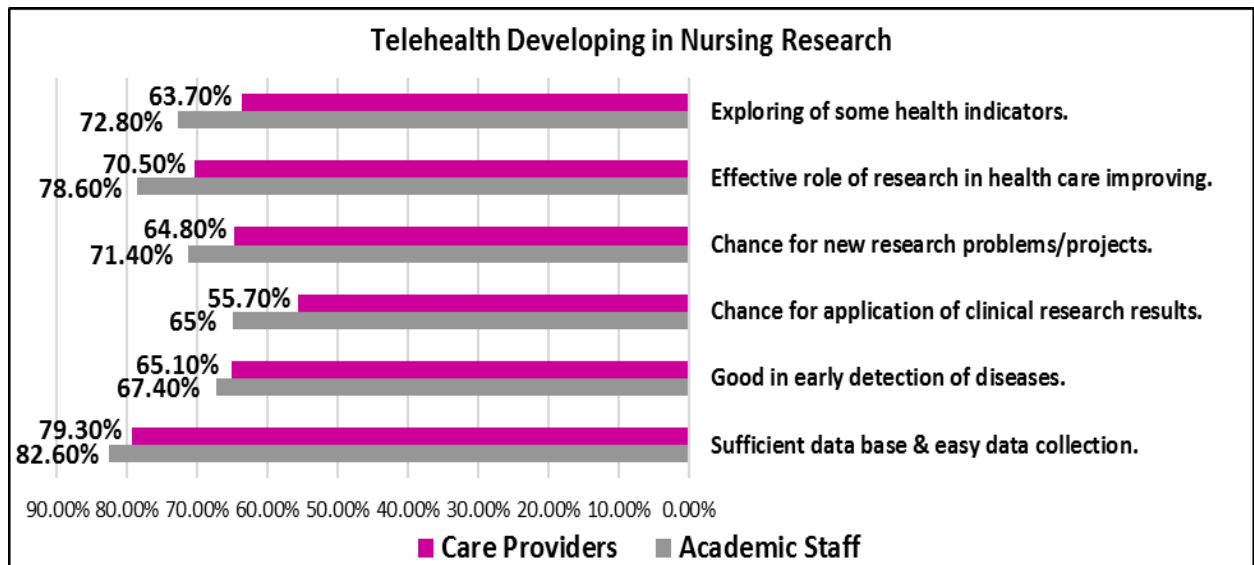
Table 3. Comparative distribution of nursing academic staff and care providers according to their opinions regarding barriers of telehealth application:

Barriers' Classification and Items	Academic Staff		Care Providers	
	n	%	n	%
A. Regularity Barriers:				
- High cost of telehealth system.	517	65.6	602	75.8
- No license and job description/classification for telehealth team.	79	10.0	57	7.2
- Untrained IT team.	219	27.8	379	47.7
- Lack of contact between IT team and telehealth team.	258	32.7	347	43.7
- Lack of maintenance for telehealth devices.	407	51.6	436	54.9
B. Technical Barriers:				
- Lack of technology using acceptance among some patients/clients.	569	72.2	584	73.6
- Unavailability of smart-internet devices (for poor patients/clients).	636	80.7	609	76.7
- Poor internet coverage for some patients/clients.	620	78.7	597	75.2
- High cost of internet coverage for some patients/clients.	482	61.2	437	55.0
- Overlapping of the organization call system coverage.	394	50.0	404	50.9
- Waiting list of services.	472	59.9	392	49.4
- Wide variety of telehealth applications.	275	34.9	227	28.6
C. Working and Telehealth Team Barriers:				
- No enough time for discussing patients'/clients' health problems.	123	15.6	210	26.4
- Over workload on telehealth team.	276	35.0	309	38.9
- Poor telehealth team relationship & communication.	135	17.1	181	22.8
- Lack of team experience in application of telehealth.	197	25.0	247	31.1
- Necessity of patient/clients' following up.	57	7.2	169	21.3
D. Educational Barriers:				
- Unavailability of well telehealth trainers.	245	31.1	290	36.5
- Poor training programs for telehealth team members.	418	53.0	472	59.4
- Following up necessity for telehealth team members.	322	40.9	241	30.4
- Insufficient telehealth education in health curriculums.	594	75.4	510	64.2
E. Legal & Ethical Barriers:				
- Telehealth team' mistakes/errors in services application process.	143	18.1	211	26.6
- Patients/clients' misuse of telehealth applications.	391	49.6	423	53.3
- Lack of laws for protecting telehealth team and patients/clients.	218	27.7	290	36.5
- Liability of un-confidentiality of data.	356	45.2	285	35.9
- Liability of outside hacking.	307	39.0	319	40.2
F. Human Resources Barriers:				
- Shortage of health team members at all.	574	72.8	611	77.0
- Unavailability of well-trained staff.	402	51.0	541	68.1
- Lack of telehealth team members' professional competency.	147	18.7	78	9.8
G. Change Agent Barriers among Telehealth Team & Patients/Clients:				
- Resistance to change health services' traditional methods.	294	37.3	348	43.8
H. Patients/Clients' Personal Barriers:				
- Low educational level of some patients/clients.	328	41.6	405	51.0
- Lack of patients'/clients' orientation with telehealth services.	387	49.1	476	59.9

Table 4. Correlation between nursing academic staff total telehealth perception score and sociodemographic characteristics (linear regression fitting model):

Model	Unstandardized coefficients		Standardized coefficients	F	t	Sig.	R-square
	B	Std. Error	Beta				
(Constant)	59.709	7.229			8.260	.000	
Age (yrs.)	.074	.084	.039		.878	.380	
Sex	-1.946	1.813	-.069		-1.074	.283	
Work affiliation	-1.024	1.222	-.033	.417	-.838	.402	0.4
Income	.096	.729	.005		.132	.895	
Additional work	-1.895	1.860	-.065		-1.019	.309	
Academic degree	-.483	.608	-.038		-.795	.427	
Residence	.090	1.148	.003		.078	.938	

Table 5. Correlation between nursing care providers' total telehealth perception score and sociodemographic characteristics (linear regression fitting model):

Model	Unstandardized coefficients		Standardized coefficients	F	t	Sig.	R-square
	B	Std. Error	Beta				
(Constant)	54.186	6.560			8.260	.000	
Age (yrs.)	-.090	.074	-.048		-1.215	.225	
Sex	-.942	1.868	-.029		-.504	.614	
Work affiliation	-1.444	1.326	-.041	3.357	-1.089	.276	2.9
Income	-.149	.803	-.007		-.185	.853	
Additional work	-2.303	1.857	-.072		-1.240	.215	
Hospital position	-.584	.501	-.043		-1.165	.244	
Residence	4.598	1.270	.137		3.621	.000	

Discussion:

Telehealth is an essential issue right now and while it is still poorly understood in underdeveloped countries, it has numerous logical implications. With adequate integration of this technology into the healthcare system, it may be possible to address global concerns such as the availability of high-quality and cost-effective services. The perception of healthcare professionals about telehealth is critical to determining the appropriate use of this technology **(Tully et al., 2021)**.

When quantitative findings and qualitative themes were combined, a richer, clearer image was produced. The perception of telehealth by nursing academic staff and caregivers was found to be positive across all classifications, as evidenced by their

respective mean scores of 54.25±13.78 and 50.43±15.92. Furthermore, there is a highly significant statistical difference between the perceptions of the two groups of all telehealth scores. The reason for this is the remarkable advancement in the use of social networks, which is essential to persuade users of the value of this technology and the advantages it offers. This, in turn, increases perceptions and enables users to fully benefit from the service. This is consistent with the research conducted by **(Koonin et al., 2020)** in the United States during the peak of the COVID-19 pandemic, who indicated in his study that nurses and patients perceived the importance and benefits of using telehealth services which led to protect patients' and nurses' health from illness and lessened the influx of patients into institutions. Additionally, the majority of patients during the early pandemic phase were treated at home, which contributed to a decline in the number of patients visiting hospitals for care.

Results of the present study demonstrated the many advantages of the perspectives of the study sample on the use of telehealth; more than three-quarters of the sample reported that, in relation to remote service delivery, telehealth can provide access to health services while also saving time, effort, and the burden of transportation. This could be because Egyptians suffer from overcrowding and traffic congestion, which can sometimes cause patients to decline to visit hospitals to receive medical advice rather than endure inconvenience, delay, and traffic. Not only did the study sample see a reduction in hospital waiting times, but it also reduced hospital stays by around two thirds.

According to the researchers' belief, patients' health and finances are more effectively preserved when they receive medical care without being exposed to hospital-associated infections. To preserve the lives of the patient and the healthcare provider, it is essential to prevent the spread of infections while maintaining access to healthcare services. Similarly, a study carried out in the United States by **(Hyder & Razzak 2020)** who confirmed in their research when measuring patient and care provider satisfaction, the study conducted in an amyotrophic lateral sclerosis clinic using live videoconference meetings replaced in-person visits, the results showed that patients were quite satisfied with their videoconferencing examinations. They observed that the use of specialized-care made it unnecessary to travel great distances and reducing the incidence of diseases transmission during pandemic period.

More than three-quarters of the study sample indicated benefits related to telehealth, which could result in cost savings for healthcare services. Patients can save money on transportation, and possible lodging costs by not having to travel to healthcare

facilities for routine examinations or consultations. On the other hand, for healthcare providers, telehealth can reduce costs by streamlining administrative tasks including billing, appointment scheduling, and medical record administration. **Lee et al., (2024**) conducted a study about telehealth use with subsequent medical costs and health care utilization; the study revealed that telehealth was linked to a somewhat lower rate of emergency department visits, hospital stays, and medical expenses. Users of telemedicine experienced a higher decrease in overall medical expenses ($-$ \$1,814 per patient annually), emergency visits (88.6 fewer per 1000 persons annually), and inpatient admissions (32.4 fewer per 1000 people annually) in comparison to those who did not utilize telehealth.

Regarding the proper delivery of healthcare services to remote locations, more than three-quarters of healthcare providers and the majority of nursing academic staff agreed that telehealth meet the patients' medical needs who are neglected in rural areas and have difficulty in maintaining their health. Telehealth services help patients and clients with their needs and reduce anxiety associated with them, particularly for those in vulnerable categories such as the elderly, children, disabled, new mothers, those with mental diseases, and others. Researchers believe that the symptoms, medication adherence, and vital signs can all be remotely monitored with telehealth technologies. In addition to relieving patients' anxiety over their condition getting worse, this proactive approach to healthcare management give patients piece of mind that their health is being watched after.

This is consistent with **(Wosik et al., 2020)** which emphasized in their study on the need of patients to stay home and receive care through telehealth which enabled more virtual care via phone and video visits, as well as electronic counseling. In addition, (**Zhai et al., 2021**) demonstrated that the deployment of virtual care solutions instead of in person services can help reduce stress and virus transmission which protect care providers and patients from illnesses in direct contact. Other study conducted by **(Aksoy et al., 2021)** to measure prenatal distress and anxiety levels, finding showed a decreased by five units in the telehealth program, which uses online videos to determine pregnant women's worry over pregnancy and birth preparation during COVID-19.

The majority of the faculty and care providers of nursing in the current study highlighted on the role of telehealth in offering new job descriptions/classifications. And three-quarters of them support increasing the number of health technology workers and strengthening health informatics. A specific job description will cover the delivery of telehealth and how it can alter users' duties and responsibilities. After having a deep

understanding of the telehealth environment, they will be more fully helpful, especially in health disasters. This is consistent with the findings of a study by **(Lee et al., 2021)**, which found a similar result; changing or establishing new jobs for healthcare providers may influence the usefulness of telehealth appears for them.

Concerning the efficacy of research in healthcare improvement and health indicators, three-quarters of the survey sample from both groups replied that telehealth would provide an adequate database and convenient data gathering. **Rockwell & Gilroy (2020)**, pointed out in their study that data and information that telehealth gathers and shares between patients and healthcare providers play a significant role in this process. Information sharing between patients and experts would result in new shared knowledge and collective perception, enhancing patients' ability to manage their own care and participation in it.

Regarding barriers to telehealth use, the study qualitatively covered key barriers from the point of view of nursing academic staff and care providers. These were technical, human, regularity, and educational barriers. This was in line with (**Blandford et al., 2020)** which claimed that it is common to underestimate the barriers to providing telehealth services. A variety of elements influenced its performance, including technical challenges, infrastructure, regulatory constraints, change management, and financial business models. The most significant barriers according to more than three-quarters of both study groups are technical difficulties such as the lack of smart-internet gadgets for impoverished patients/clients and inadequate internet connectivity.

More than two thirds of those surveyed had mentioned the lack of health team members as one of the human resources barriers. The expensive cost of the telehealth system was mentioned by study groups as a regularity barrier. Regarding educational barriers, two thirds of care providers and three quarters of academic staff indicated a lack of telehealth instruction in nursing curricula as a key factor. Since telemedicine was unavailable to everyone without a computer or smartphone, reliable internet or wireless connectivity, or both, it might be said that unequal access to telehealth is one of the primary barriers. People were not convinced of the benefits of distance treatment in some circumstances due to issues such as the possibility of misdiagnosis or other negative outcomes of some treatments provided remotely.

Furthermore, **(Adepoju, 2020)** noted that infrastructural, technological, and regulatory barriers, as well as a lack of regional standards, may have revealed the disparity

in perceived efficacy between country income levels. Furthermore, **(Al-Samarraie et al., 2020)** investigated the progress of the use of telemedicine in the Middle East and found the main factors that influence the development of telemedicine in these countries. They pointed out that the development of the use of telemedicine was insufficient in the Middle East due to cultural, financial, organizational, human, technological and legal concerns, as well as regulatory challenges.

The regression model utilized in this study revealed the most predictors (factors) that influenced the total telehealth perception score of nursing academic staff and care providers. Those predictors expressed only 0.4% and 2.9% of the factors influencing the level of total perception score of nursing academic staff and care providers, respectively. Work affiliation and residency could influence people's conceptions, thoughts, and attitudes about a variety of issues, particularly those concerning the altering quality of health care services.

Most people used to obtain or offer health care in person. Then it would be difficult to modify this base due to some of the elements that impact this transition, such as rural and distant region services, family socioeconomic situation, and the nature, norms, and traditions of some Egyptian groups.

Conclusion:

Telehealth was positively perceived positively by nursing academic staff and care providers. Their perspectives on the benefits of telehealth focused on the creation of new job descriptions and classifications, effectiveness of disaster response, delivery of health services to remote places, and helping clients reduce anxiety. Although the main barriers were technical, there was a shortage of health team members and educational limitations.

Recommendation:

In the light of the study findings, the following recommendation could be suggested:

The study shed light on the importance of integrating telehealth into nursing students' academic curricula, its application in capstone projects, and the use of media to encourage telehealth use and convince consumers of its benefits. Researchers must also investigate the significance of the use of telehealth in scientific research.

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الملخص العربي

الفوائد والمعوقات التي تحول دون الاستفادة من الخدمات الصحية عن بعد من وجهة نظر أعضاء هيئة التدريس في التمريض ومقدمي الرعاية الصحية في مصر: دراسة مقطعية متعددة الأساليب

مقدمة : تشير الرعاية الصحية عن بعد إلى تقديم الرعاية أو الخدمات الطبية عن بعد وليس شخصيًا. وفقًا لـ Global Market Insights، قُدرت قيمة سوق الرعاية الصحية العالمي عن بعد بقيمة 56 مليار دولار في عام 2020. **هدف الدراسة :** هو تحليل تصورات أعضاء هيئة التدريس الأكاديميين في التمريض ومقدمي الرعاية حول الفوائد والعوائق التي تحول دون استخدام الخدمات الصحية عن بعد. **تصميم الدراسة:** تم تنفيذ التصميم المتزامن للطريقة المختلطة (الكمي والنوعي) باستخدام مسح مقطعي عبر الإنترنت. **عينة الدراسة:** تكونت العينة من (788 من أعضاء هيئة التدريس الأكاديميين للتمريض و794 من مقدمي الرعاية التمريضية). **أدوات الدراسة : (1)** استبيان لتقييم الجوانب الديموغرافية وإدراك الرعاية الصحية عن بعد. **(2)** التقييم النوعي للفوائد والمعوقات التي تحول دون الاستفادة من الخدمات الصحية عن بعد. **نتائج الدراسة:** كان متوسط درجات إدراك المشاركين عن الرعاية الصحية عن بعد إيجابيـة (مجموعـة هيئة التدريس الأكاديمية للتمريض: 54.25±13.78؛ مجموعـة مقدمي الرعاية التمريضية: 50.43±15.92). ومن حيث فائدة الرعاية الصحية عن بعد في توفير الرعاية الصحية للأماكن الريفية، كانت آراء كلا المجموعتين 98.4% و86.2% على التوالي. ومع ذلك، كان العائق الرئيسي هو الافتقار إلى تعليم الرعاية الصحية عن بعد في مناهج التمريض الأكاديمية (75.4٪). **خلاصة الدراسة :** خلصت الدراسة إلى أنه تم النظر إلى الرعاية الصحية عن بعد بشكل إيجابي من قبل أعضاء هيئة التدريس الأكاديميين في التمريض ومقدمي الرعاية، وركز إدراك المشاركين في البحث حول فوائد الرعاية الصحية عن بعد في تطوير توصيف وظيفى بتصنيفات جديدة ، وفعالية تخفيف القلق، والحصول على الرعاية الصحية للأشخاص الذين يعيشون في الأماكن النائية، على العكس من ذلك، كانت ندرة أفراد الفريق الصحي المتخصص، والعوائق التعليمية، والقضايا التكنولوجية هي العوائق الرئيسية. **التوصيات:** دمـج الرعاية الصحية عن بعد في البرنامج الأكـاديمي لطـلاب التمريض وتـوفير التقنيـات ذات الصـلة لاستخدامها في مشاريع التخرج.

الكلمات الدالة: المعوقات؛ فوائد؛ تكنولوجيا الرعاية الصحية؛ أعضاء هيئة التمريض؛ الإدراك؛ الرعاية الصحية عن بعد