Article

The effects of a 'COVID Nurse Assistant' application on patient satisfaction in COVID isolation rooms

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Abstract

Introduction: The COVID-19 pandemic has caused a major shift in the healthcare delivery system. With the limited personal protection equipment and a nursing service shortage caused ineffective nursing care delivered to COVID-19 patients. Wearing full personal protective equipment (PPE) hinders nurse-patients communication and inhibiting the achievement of treatment goals. This study aims to examine the effect of a 'COVID Nurse Assistant' (CNA) application on patient satisfaction in COVID-19 isolation rooms.

Design and Methods: This was a comparative study with an experimental and control group design. The participants were patients confirmed positive with COVID-19 receiving care in an isolation room for at least three days and were fully conscious. The intervention used was accessing health information related to COVID-19 through a mobile-friendly application namely-'COVID Nurse Assistant'. The instrument used was the Patient Satisfaction Questionnaire (PSQ-18) translated into Bahasa Indonesia. In addition, an independent t-Test was used to perform statistical analysis.

Results and Discussions: A total 158 respondents completed the online survey among of 219 eligible patients (72% response rate). The score in the general and financial satisfaction sub-scales reported by patients in the experimental group were significantly different from the control with p-values of 0.032 and 0.018 respectively. However, other subscales were not significantly different between the two groups.

Conclusions: The implementation of the CNA online application has noteworthy implications on patient satisfaction. However, further studies examining similar system in different clinical areas would provide better information for the optimal use of technology in patient education.

Introduction

COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, after its first appearance in Wuhan, China in December, 2019.[1] The increased prevalence of cases indicates the need for specific policies for handling and preventing transmission. The symptoms of COVID-19 characterized by fever and dyspnea due to acute respiratory dysfunction have led to an increase in the number of patients requiring treatment in the hospital.[2] Meanwhile, the hospital treatment varies according to the symptoms experienced by patients, with approximately 20% requiring oxygen therapy and 5% being treated in the intensive care unit.[3] In Indonesia, the number of positive cases reached 66,226 between March to July October 2020 with 30,785 recovered and 3,309 deaths spread over 497 regencies/cities in 34 provinces.[4]

The increase in COVID-19 cases has led to problems due to the increasing number of patients requiring hospitalization and the burden on health services. Overcrowding has caused increased stress and burden on health care workers, especially nurses who are on the front line.[5] Nurses are the health workers with the greatest patient contact and play an important role in managing and responding quickly to patients.[6] In treating patients with COVID-19, strict Protocols must be implemented to minimize the risk of transmission. The use of protective equipment such as gloves, long-sleeved disposable gowns, respirators, and eye protection such as goggles or face shields is standard procedure for all nurses caring for these patients.[7] Aside from preventing infection, the use of PPE also has several negative impacts, such as physical discomfort and difficulty in interacting with patients, especially communication and orientation.[8-10] Nurses stated that patients are often unable to recognize them when they are wearing PPE. This difficulty in interacting with patients disrupts therapeutic communica-

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Significance for public health

COVID-19 pandemic drives significant shifting and numerous emerging problems in the global health system. Health education and promotion that focuses on COVID-19 care for the patient, infection transmission, and prevention strategies were urgently provided publicly in hospital and community settings. However, it cannot be conducted in the conventional method, as printed flyers or brochures can be media for transmission. The nurse working in the COVID-19 isolation room is experiencing the most difficulties in educating and communicating with patients and family. The study provided innovation in delivering health education using CNA's integrated online platform. The study will provide important information on whether the CNA is effective as health education media for COVID-19 patients and their families. Positive results may become a helpful consideration to develop a better application to enhance health education in the community.

tion and implementation of care needed by patients, including informed consent and discharge planning.

The needs of patients hospitalized due to COVID-19 include emotional support and orientation on the scheduled services. Emotional support and the accompanying hope enhance healing, while orientation to services provides a sense of security and collaboration with therapeutic interventions.[8]

Orientation to services can improve engagement and motivate patients to participate in treatment.[8] In addition, the process of providing information regarding discharge planning is very important to patients. Discharge planning for patients with COVID-19 includes providing information regarding the recommendation for self-isolation at home which is expected to increase transmission prevention behavior. It also ensures continuity of care[11] and includes a discussion of home remedies, self-care instructions, and follow-up care arrangements. This involves engaging with the patient and family at least 24 hours before discharge. When dealing with patients infected with COVID-19, the problem that arises is related to the use of several paper-based tools which require effective communication. Paper-based tools pose a risk of infection when handled by both nurses and patients, while social distancing and PPE inhibit effective communication.

The use of technology media in the provision of care has become an important strategy in health services since the advent of the COVID-19 pandemic. The utilization of technology for screening, diagnosis, delivery of information and patient monitoring has become more useful. This can be in the form of applications on smartphones or Website-based.[12,13] The development of the 'COVID Nurse Assistant' (CNA) application is in the form of a website containing health information for COVID-19 patients. The information contains patient service orientation materials from admission to discharge and can be accessed from the patient's smartphone. Furthermore, it includes treatment that will be carried out, the hospital and the staff available to provide services with names and photographs, as well as complete discharge planning information. It is expected that this innovation can overcome some of the problems of providing information to patients treated in the COVID-19 isolation rooms.

Design and Methods

This was a comparative study with experimental and control group design to examine differences in patient satisfaction regarding health care provided by nurses in COVID-19 isolation rooms. The respondents were patients diagnosed with COVID-19 and receiving care in the isolation rooms of Dr. Saiful Anwar Hospital, Malang, East Java, Indonesia. The inclusion criteria included respondents who were fully conscious with the Glasgow Coma Scale of 4, 5, or 6, and had received care in an isolation ward for a minimum of three days.[14] Patients who met these criteria were considered to have been adequately exposed to nursing care and capable of providing evaluation regarding the quality of care being provided. Dr. Saiful Anwar hospital is the second-largest referral hospital in East Java. During the pandemic, it was appointed by the provincial government to be a referral hospital for COVID-19 patients. In March 2020, the isolation unit consisted of 2 wards with 30 and 40 beds, respectively. Due to the increasing number of patients confirmed positive with COVID-19, the hospital added four wards with 200 overall beds. During the second wave in July-August 2021, the Bed Occupation Rate (BOR) reached 100% forcing the hospital to add another 250 beds to serve patients not only from Malang but also neighboring cities such as Blitar, Pasuruan, Probolinggo and Sidoarjo.

The 'COVID Nurse Assistant' (CNA) is a mobile-friendly application that provides online education for patients with COVID-19 and their families. The application was developed by the study team in collaboration with nurses in the isolation unit and was officially introduced by the hospital in January 2021. It consists of two major sections namely education for patients and families. Both sections display posters and videos related to COVID-19 such as, how to select a diagnostic test for COVID-19; patient orientation in isolation rooms; healthcare provided in isolation rooms, stress management, hospital chaplain services, diet, as well as medication and exercise recommendations. It also introduces patient discharge information, thereby making the transition of care to be implemented smoothly. A video about handling the deceased is also included in the education for the family section to give them an understanding of the respect placed on their religion. The hospital promoted the application through banners and posters displayed in the isolation wards and their surroundings.

Recruitment

Although frequently promoted by nurses and staff, some patients did not access the application. Therefore, the experimental and control groups were self-selected with patients that decided to access the application or not.

Data collection

Data collection was conducted by study team members who are nurses working in isolation rooms. The survey in a google form was accessible in the CNA application, hence, patients who accessed the application were able to complete the survey after accessing information. For the control group, the survey was distributed online by a link sent by Whatsapp to patients which is similar to the normal procedure in this hospital to collect patient satisfaction data. A consent form was included as part of the google form and the participants were required to agree and proceed to complete the survey. Moreover, this study received ethical approval from the Health Research Ethics Committee of the Faculty of Nursing, University of Jember (Number 68/UN25.1.14/KEPK/2021).

Measurement of patient satisfaction

Patient satisfaction data were collected using the patient satisfaction questionnaire (PSQ-18) that has been translated to Bahasa Indonesia using backward translation. The instrument was validated using content validity with items selection considered by the correlation coefficient > 0,3 and reliability estimation of 0.928.[15] The Indonesian version of the PSC-18 consists of 18 items that are divided into seven subscales namely General Satisfaction, Technical Quality, Interpersonal Manner, Communication, Financial Aspects, Time spent with Nurses, as well as Accessibility and Convenience.[15] The PSQ-18 uses a five-point Likert scale that ranges from 1 representing strongly disagree to 5 meaning strongly agree to reflect patient satisfaction toward healthcare services. Items numbered 4, 7, 9, 10, 12, 13, 14, 16, and 17 are negatively worded and reversely scored. The patient satisfaction score is derived from the average score within the seven subscales,[16,17] higher scores indicate greater patient satisfaction. Furthermore, additional demographic questions such as gender, age, educational level, occupation, and marital status were included for further information. Questions about the benefit of the CNA application to improve patient knowledge and confidence to manage self-care at home were also added.

Statistical analysis

The characteristics of respondents in the control and experimental groups were examined using descriptive analysis, while the

effects of the CNA application on patient satisfaction were compared between the two groups using an independent t-Test with a significance level of 0.05. The p-value of less than 0.05 indicates a significant difference in patient satisfaction scores.

Results and Discussions

A total of 219 COVID-19 patients were eligible to participate in this study and 158 respondents staying in COVID isolation rooms for a minimum of three days completed the online survey providing a total response rate of 72%. Furthermore, 53.8% or n=85 of the patients accessed the CNA application and formed the experimental group, while 46.2% or n=73 did not access the application and formed the control. The majority of respondents were female n=80; 51%, the largest age group was between 51-60 years old with n=40; 25%, most were married n=129; 81%, worked in private businesses n=57; 36% while the most common highest level of education was a high school diploma n=65; 41%. The respondents' characteristics are shown in Table 1, while the opinions on how the access to the CNA application improved knowledge and confidence in home-based self-care after discharge are shown in Figure 1. The majority of respondents who accessed the application reported improvement in knowledge related to COVID-19 namely 62.7% and increased confidence to manage self-care at home with 61.6%. Furthermore, the aspects of improvement experienced by patients presented in Figure 2 include patients' medication adherence 67%, ability to practice exercise at home 58.5%, more healthy diets consumption 66%, better understanding of Self-isolation 51,1%, and COVID-19
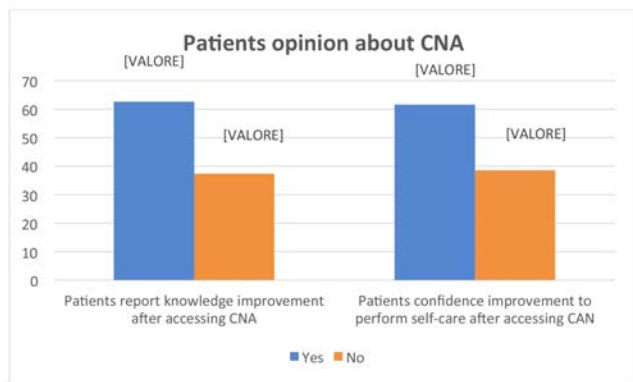

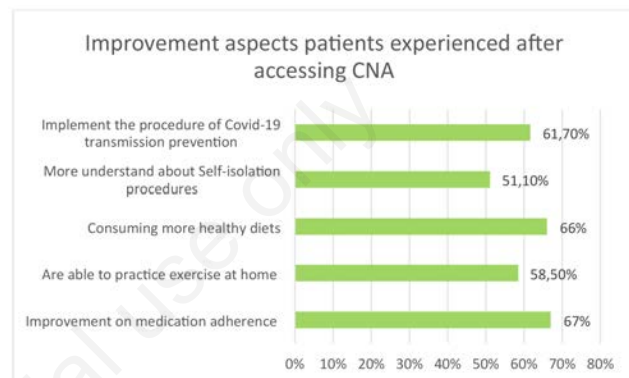**Figure 1. Patients' opinion about CAN.**

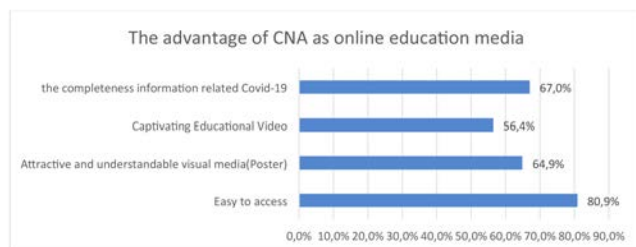**Figure 2. Improvement aspects patients experienced after accessing CNA.**

Table 1. Respondents' characteristics.

Characteristics	Experimental group (n=85)		Control group (n=73)	
Demographic factors	n	%	n	%
Gender				
Male	46	54	32	44
Female	39	46	41	56
Age				
≤ 20 years old	1	1	1	1
21-30 years old	12	14	8	11
31-40 years old	23	27	15	21
41-50 years old	14	17	16	22
51-60 years old	19	22	21	29
>60 years old	16	19	12	16
Marital Status				
Not Married	8	9	7	10
Married	69	82	60	82
Widowed	8	9	6	8
Educational Level				
Elementary/middle school	8	9	3	4
High school diploma	29	34	36	49
College degree	48	57	34	47
Occupation				
Private organization/company	33	39	24	33
Civil Servant	12	14	5	7
Entrepreneurs	13	15	13	18
Students	3	4	2	3
Retirement	10	12	7	10
Not working	14	15	22	18

transmission prevention procedure 61.7%. This indicates a positive implication of the CNA application to patients. The respondents also mentioned several advanced features of the CNA application that differ from conventional education media, including ease of accessibility 80.9%, attractive and easily understood 64.9%, educational 56.4%, and comprehensive 67%.

Patient satisfaction levels

Table 2 displays the patient satisfaction levels of both the control and experimental groups. The experimental group's subscale score ranged between 3.83 for time spent with nurses to 4.19 for interpersonal manner, while the control group scored lower overall, with a range of 3.41 for financial aspects to 3.95 for interpersonal manner. The comparison of patient satisfaction scores between the two groups is presented in Figure 3. In all seven subscales, the experimental group reported a higher average score of satisfaction than those in the control. This implies that patients who accessed health information related to COVID through the CNA application are more likely to be satisfied with their healthcare than those who did not.

The effect of the 'COVID Nurse Assistant' (CNA) application on the patient satisfaction level

The differences in patient satisfaction scores between the control and experimental group were examined in Table 3 and Figure 4. The patient satisfaction scores in the general and financial satisfaction subscales reported by those in the experimental group were

Figure 3. The advantage features of CNA as online education media.
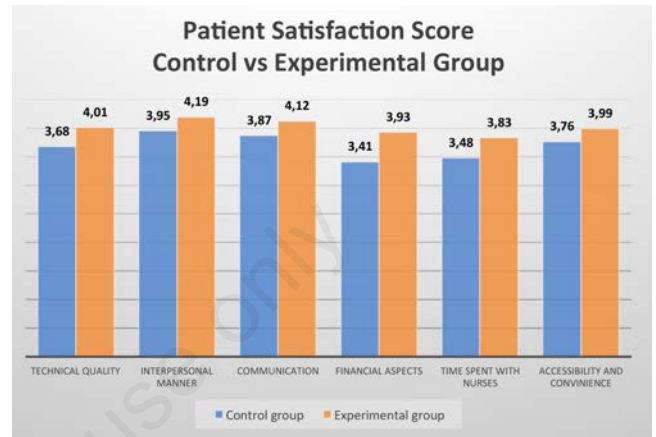
Figure 4. Patient satisfaction score control vs experimental group. Notes: Patient satisfaction score is an average score within subscales.

Table 2. Patient satisfaction level between control and experimental group.

Patient Satisfaction Subscales	Groups	Mean	Std. Deviation
General satisfaction	Control group	3.77	0.408
	Experimental group	3.94	0.569
Technical quality	Control group	3.68	0.463
	Experimental group	4.01	0.451
Interpersonal manner	Control group	3.95	0.528
	Experimental group	4.19	0.567
Communication	Control group	3.87	0.527
	Experimental group	4.12	0,528
Financial aspects	Control group	3.41	0.436
	Experimental group	3.93	0.632
Time spent with nurses	Control group	3.48	0.724
	Experimental group	3.83	0.750
Accessibility and convenience	Control group	3.76	0.437
	Experimental group	3.99	0.571

Table 3. Table independent t-test patients satisfaction level between control and experimental groups.

Patient Satisfaction Subscale	p-value	Mean Difference	95% Confidence Interval of the Difference	
General satisfaction	0.032	-0.17	-0.33	-0.02
Technical quality	0.932	-0.33	0.07	-0.48
Interpersonal manner	0.366	-0.24	0.09	-0.42
Communication	0.875	-0.25	0.08	-0.42
Financial aspects	0.018	-0.52	0.09	-0.69
Time spent with nurses	0.594	-0.35	0.12	-0.58
Accessibility and convinience	0.093	-0.23	0.08	-0.39

significantly different from the control group with p-value 0.032, and 0.018 respectively. However, other subscales such as technical quality, Interpersonal Manner, Communication, Time Spent with Nurses, Accessibility and Convenience were not significantly different between the two groups.

This study examined the effects of online education media on patient satisfaction in isolation rooms. The emerging problems during the COVID-19 crisis required rapid and innovative measures to overcome predicaments involved in providing healthcare in isolation rooms. In the education sector, there has been a major shift from conventional to virtual classes,[18] a strategy which can also be implemented to deliver patient education in healthcare settings[19]. The creation of CNA, a mobile-friendly application to provide audio-visual information related to COVID-19 is a suitable adjunct to patient education, especially in isolation rooms. Although the strategy seems promising, an apprehensive assessment of its impact will provide better evidence to support further implementation. The number of patients who accessed and did not access the CNA application was not the same, but several characteristics between the two groups were similar. The majority of patients who accessed the application reported gaining more knowledge related to COVID-19 and that the overall information provided was attractive and easy to understand. Most of the information provided in the CNA application was in visual or audio-visual form. Previous studies stated that videos as educational tools improve patients' knowledge[20, 21] and awareness related to their conditions.[21] A recent study into the impact of video-assisted education reported that it improves activities of daily living and quality of life for postoperative patients.[22] This implies a promising positive benefit of technology for patient education in the future.

The CNA application compiles all flyers and videos related to COVID-19 into a single integrated system that can be accessed by both patients and family members anywhere and anytime. It also allows patients to have multiple logs in and all materials contained are reviewable. A study stated that education using video and printed material can improve knowledge retention for patients when properly utilized.[23] These advantages were also confirmed in this study as the participants underlined the unique features of the CNA application which include comprehensiveness, attractiveness, and accessibility. A similar application that educates maternal and child patients using videos accessed on mobile phones was shown to be handy for health workers.[24] The CNA provides the same assistance for nurses in isolation room as it enhances their authority to educate patients in a restricted environment.

Based on the results, patients who accessed the CNA application were more satisfied in general than those who did not. In the financial aspects subscale, the patient satisfaction scores in the experimental group exceeded that of the control. The financial aspect focuses on the assumption of equality in care regardless of the patient economic status.[16, 17] In Indonesia, patients confirmed positive with COVID-19 are automatically covered for healthcare by the Indonesia Ministry of Health which provides equal care to all patients.[25] Although financial cost is not an issue, in this case, patients who did not access the information application might not receive sufficient education or fully understand the reason for the limited visits by nurses during their stay in the isolation rooms.

Despite the insignificant difference in the score of time spent with nurses between the two groups, patients in the control group scored lower, stating that nurses were in hurry during their visit and only provide limited attention. This dilemmatic phenomenon is prevalent during the COVID-19 pandemic. Massive escalation of patients confirmed positive were not balanced with a sufficient number of nurses assigned in isolation rooms.[26] Moreover, due to shortage of PPE and rapid transmission, CDC suggests that the nurse work duration be shortened,[27] thereby reducing the number of available nurses taking care of patients in the isolation room. Usually, four nurses are assigned to the isolation room wearing PPE consisting of FFP2 respirator face mask, and googles[7] to handle approximately 70 patients. With this full PPE, nurses can only endure for five hours at most, hence, they might not spend sufficient time to care for their patients or prioritize more critical cases. Patients who access the CNA application were informed about this arrangement and were slightly more supportive towards this chaotic situation.

Technical quality, interpersonal manner, communication, accessibility, and convenience were not significantly affected by patient education using the CNA application. This is presumably because patients with COVID-19 are more likely to restrict themselves from using cellphones. In addition, pain, respiratory distress, and severe anxiety experienced are quite overwhelmed. Several studies showed a high prevalence of anxiety, depression, and psychotic disorder in COVID-19 patients.[28, 29] This is probably triggered by inflammatory reactions in the body causing the elevation of TNF-alpha levels that potentially contributes to the mechanism for psychosis.[28] Although the effect of acute hypoxia on cognitive processes remains debatable, evidence shows that it potentially impair cognitive function.[30] This indicates that COVID-19 symptoms and the patient's clinical condition remain uncontrollable factors that impede information transfer, regardless of the advanced media being used.

Based on the results, patients that accessed the CNA application are more confident to take care of themselves after discharge. This individual belief to perform a particular task often referred to as self-efficacy[31, 32] directly influences behavioral intention and behavior. Although the influence of education on self-efficacy remains unclear, its effects on behavioral intention have been proven.[33] This is also consistent with the results obtained in this study where the majority of patients with improved confidence of self-care claimed a better medication adherence, consume healthier diets, have a more active lifestyle, and better implementation of health procedures related to COVID-19. When patients are well-informed, they have better self-efficacy towards healthier behaviors. Furthermore, sufficient health education leads to patient engagement meaning that patients are capable of making shared decisions related to their preferred treatments.[34] Several studies stated that this strategy is a promising intervention to improve health outcomes and quality such as adherence to treatment recommendation,[35] mortality from major events,[36] and patient satisfaction.[37] This highlights the importance of adequate health education for better patient outcomes and the achievement of quality healthcare. This study has certain notable limitations, first, the use of technology reduced participation due to the cost, thereby limiting people from lower socioeconomic backgrounds. Second, the study was conducted only in one referral hospital for COVID-19 in East Java, Indonesia. The implementation of multi-center studies is expected to allow better generalization of results.

Conclusions

The implementation of the CNA application as an integrated online education medium has noteworthy implications on patient satisfaction as a healthcare quality indicator. However, further studies are needed to examine the effects of online applications in the form of health education platforms in different clinical areas such as medical and surgical wards. This study can also be expanded to explore the implication of online educational media on patient engagement or other health outcomes.

References

1. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. Acta Bio Medica: Atenei Parmensis 2020;91:157.
2. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020;395:497-506.
3. Lin S, Pan H, Wu H, et al. Epidemiological and clinical characteristics of 161 discharged cases with coronavirus disease 2019 in Shanghai, China. BMC Infect Dis 2020;20:1-10.
4. Kahar F, Dirawan GD, Samad S, et al. The Epidemiology of COVID-19, Attitudes and Behaviors of the Community During the COVID Pandemic in Indonesia. IJISRT 2020;5:1681–7.
5. Lin S, Pan H, Wu H, et al. Epidemiological and clinical characteristics of 161 discharged cases with coronavirus disease 2019 in Shanghai, China. BMC Infect Dis 2020;20:780.
6. Arasli H, Furunes T, Jafari K, et al. Hearing the voices of wingless angels: A critical content analysis of nurses' COVID-19 experiences. Int J Environ Res Public Health 2020;17:8484.
7. World Health Organization. Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19) and considerations during severe shortages. Geneva: WHO; 2020.
8. Purcell LN, Charles AG. An Invited Commentary on "World Health Organization declares global emergency: A review of the 2019 novel Coronavirus (COVID-19)": Emergency or new reality? Int J Surg 2020;76:111.
9. Galehdar N, Toulabi T, Kamran A, et al. Exploring nurses' perception about the care needs of patients with COVID-19: a qualitative study. BMC Nursing 2020;19:1-8.
10. Wong CKM, Yip BHK, Mercer S, et al. Effect of facemasks on empathy and relational continuity: a randomised controlled trial in primary care. BMC Fam Pract 2013;14:1-7.
11. Yam CH, Wong EL, Cheung AW, et al. Framework and components for effective discharge planning system: a Delphi methodology. BMC Health Serv Res 2012;12:1-16.
12. Nguyen OT, Tabriz AA, Huo J, et al. Impact of Asynchronous Electronic Communication–Based Visits on Clinical Outcomes and Health Care Delivery: Systematic Review. J Med Internet Res 2021;23:e27531.
13. Abd-Alrazaq A, Hassan A, Abuelezz I, et al. Overview of Technologies Implemented During the First Wave of the COVID-19 Pandemic: Scoping Review. J Med Internet Res 2021;23:e29136.
14. Nursalam D. Nursing Management: Applications in Professional Nursing Practice. Jakarta: Salemba Medika; 2014.
15. Imaninda V, Azwar S. Modification of patient satisfaction questionnaire short form (PSQ-18) into Indonesian. Jurnal Psikologi UGM 2016;2:229467.
16. Marshall GN, Hays RD. The Patient Satisfaction Questionnaire Short Form (PSQ-18). Santa Monica, CA: RAND Corporation; 1994.
17. Thayaparan AJ, Mahdi E. The Patient Satisfaction Questionnaire Short Form (PSQ-18) as an adaptable, reliable, and validated tool for use in various settings. Medical Education Online 2013;18:21747.
18. Leigh J, Vasilica C, Dron R, et al. Redefining undergraduate nurse teaching during the coronavirus pandemic: use of digital technologies. Br J Nurs 2020;29:566-9.
19. Woolliscroft JO. Innovation in Response to the COVID-19 Pandemic Crisis. Acad Med 2020;95:1140-1142.
20. Gagne M, Legault C, Boulet L-P, et al. Impact of adding a video to patient education on quality of life among adults with atrial fibrillation: a randomized controlled trial. Patient Educ Counsel 2019;102:1490-8.
21. Idriss NZ, Alikhan A, Baba K, et al. Online, video-based patient education improves melanoma awareness: a randomized controlled trial. Telemedicine and e-Health 2009;15:992-7.
22. Peker SV, Yılmaz E, Baydur H. The effect of preoperative video-assisted patient education on postoperative activities of daily living and quality of life in patients with femoral fracture. J Clinical Experiment Investigat 2020;11:em00736.
23. Wilson EA, Park DC, Curtis LM, et al. Media and memory: the efficacy of video and print materials for promoting patient edu-

cation about asthma. Patient Educ Counsel 2010;80:393-8.

24. Fiore-Silfvast B, Hartung C, Iyengar K, et al. Mobile video for patient education: the midwives' perspective. In: Proceedings of the 3rd ACM Symposium on Computing for Development - ACM DEV '13 [Internet]. Bangalore, India: ACM Press; 2013 [cited 2022 Jan 1]. p. 1. Available from: http://dl.acm.org/citation.cfm?doid=2442882.2442885

25. Ministry of Health Republic of Indonesia. Ministry of Health Decision No. HK.01.07/Menkes/238/2020 about Technical Instructions for Reimbursement of Treatment Costs for Certain Emerging Infectious Disease Patients for Hospitals Providing Corona Virus Disease 2019 (COVID-19) Services. Jakarta: Ministry of Health Republic of Indonesia; 2020.

26. Setiati S, Azwar MK. COVID-19 and Indonesia. Acta Medica Indonesiana 2020;52:84-9.

27. National Center for Immunization and Respiratory Diseases (U.S.). Division of Viral Diseases., editor. Strategies to mitigate healthcare personnel staffing shortages. 2020 Apr 30; Available from: https://stacks.cdc.gov/view/cdc/88616

28. Lim ST, Janaway B, Costello H, et al. Persistent psychotic symptoms following COVID-19 infection. B J Psych Open 2020;6:e105.

29. Yohannes AM. COPD patients in a COVID-19 society: depression and anxiety. Expert Rev Respir Med 2021;15:5–7.

30. Nakata H, Miyamoto T, Ogoh S, et al. Effects of acute hypoxia on human cognitive processing: A study using ERPs and SEPs.

J Appl Physiol 2017;123:1246-55.

31. Bandura A. Guide for Constructing Self-Efficacy Scales (Revised) [Internet]. ResearchGate. [cited 2022 Jan 1]. Available from: https://www.researchgate.net/ publication/233894825_Guide_for_Constructing_Self-Efficacy_ Scales_Revised

32. Heslin PA, Klehe U-C. Self-Efficacy. 2006 Sep 22; cited 2022 Jan 1; Available from: https://papers.ssrn.com/ abstract=1150858

33. Bastani F. The effect of education on nutrition behavioral intention and self-efficacy in women. Health Scope 2012;1: 12-7.

34. Coulter A. Patient engagement—what works? J Ambulatory Care Manag 2012;35:80-9.

35. Nieuwlaat R, Wilczynski N, Navarro T, et al. Interventions for enhancing medication adherence. Cochrane Database Syst Rev 2014;2014:CD000011.

36. Meterko M, Wright S, Lin H, et al. Mortality among patients with acute myocardial infarction: the influences of patient-centered care and evidence-based medicine. Health Services Research 2010;45:1188-204.

37. Loh A, Simon D, Wills CE, et al. The effects of a shared decision-making intervention in primary care of depression: a cluster-randomized controlled trial. Patient Educ Counsel 2007;67:324-32.