

Running title: Nurses perspectives on alternative communication strategies

Nurses' perspectives on alternative communication strategies use in critical care units

Ensa Johnson, PhD, Senior Lecturer, Centre for Augmentative and Alternative Communication,
University of Pretoria, Private Bag X20 Hatfield, Pretoria 0028, South Africa

Email: ensa.johnson@up.ac.za

Tanya Heyns, RN, DLitt et Phill, Associate Professor, Department of Nursing Science, University of
Pretoria, Private Bag X323, Arcadia, Pretoria, 0007, South Africa

Email: tanya.heyns@up.ac.za

Stefan Nilsson, RN, PhD, Associate Professor, Institute of Health and Care Sciences, Sahlgrenska
Academy, University of Gothenburg, Box 457, 405 30, Gothenburg, Sweden.

Email: stefan.nilsson.4@gu.se

Corresponding author:

Ensa Johnson, Centre for Augmentative and Alternative Communication, University of Pretoria,
Private Bag X20 Hatfield, Pretoria 0028, South Africa

Email: ensa.johnson@up.ac.za

The authors report no conflict of interest.

Abstract

Aim: This study aimed to determine the perspectives of South African nurses working in critical care units on the frequency of use of alternative communication strategies to support patient-centered communication with critically ill adult patients.

Background: Critically ill patients have the right to communicate and participate in their treatment to avoid adverse medical outcomes due to the severity of their illness, their responsiveness and level of consciousness. This human right has often been neglected by healthcare professionals, as a result of limited alternative communication support provided to patients who are unable to speak due to, for example, endotracheal intubation. Despite the successful use of alternative communication strategies in critical care units in other countries, limited implementation in South African hospitals has been reported.

Design: The study followed a quantitative non-experimental survey research design.

Methods: A total of 210 nurses working in both private and public hospitals completed a survey on their perspectives on the use of alternative communication strategies in critical care units.

Results: Nurse participants reported experience working with critically ill and communication-vulnerable patients. Nurse-patient communication mainly involved the use of pen and paper, facial expressions and gestures to obtain information relating to patients' needs and their health history. Limited use of speech-generating communication devices was reported.

Conclusion: Nurse training on the use and implementation of alternative communication strategies, such as communication boards or electronic speech-generating devices, should be investigated to improve nurses' communication with communication-vulnerable patients in South Africa.

Relevance to clinical practice: The results are applicable in clinical practice due to patients' need for alternative communication. The nurses mainly used low tech solutions, which are cheap and easy to access. However, there exists an opportunity to increase the use of available digital solutions.

"What is known about this topic"

- Communication with critically ill patients in the CCU is challenging due to the patients' individual levels of consciousness, levels of cognitive impairment and fatigue.
- Nurses need to obtain information from patients about their health history to ensure individualized and appropriate interventions.
- Alternative communication supports, such as communication boards, electronic speech-generating devices and tablets with communication applications, have been used with success in CCUs.

"What this paper adds"

- Critically ill patients have the right to communicate.
- Nurses should make available alternative methods of communication support to patients for use in CCUs.
- Nurses working in CCUs should be trained on the implementation of augmentative and alternative strategies to enable critically ill patients to communicate.

Keywords: augmentative and alternative communication; communication board; communication vulnerable; nurse-patient communication

1 Introduction

“Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers” [1]. This statement from Article 19, Section 2, of the Universal Declaration of Human Rights underscores the principle that all people, irrespective of their age, status, ability or communicative capacity have the right to communicate [2]. Within the critical care unit (CCU), critically ill patients also have the need for and right to effective communication to avoid adverse medical outcomes [3, 4]. This right to freedom of opinion and expression should take into consideration that interactions between nurses and patients in CCUs are influenced by a patient's level

of consciousness, severity of illness and degree of responsiveness [5]. Regrettably, healthcare professionals working in CCUs sometimes do not give patients the opportunity to provide input and be part of decision making for their treatment. Thus, they deprive patients of their right to communicate [6, 7].

Critically ill patients admitted to CCUs frequently require mechanical ventilation. This often results in patients being unable to speak and may consequently have an impact on effective communication with nurses [8]. Blackstone [9] defined patients with a limited ability to speak, hear, understand, read and write as communication vulnerable. Communication-vulnerable patients with temporary conditions (e.g. conscious but mechanically ventilated) may experience vulnerability, frustration, anger, stress and anxiety due to ineffective communication and communication breakdowns [5, 10, 11]. These communication-vulnerable patients may be at risk of developing physiological distress that causes them to withdraw from interaction with nurses [8]. When patients withdraw and refuse to continue participating in their own treatment, it could lead to a situation where nurses and other healthcare professionals no longer have sufficient information to address these patients' needs [8, 12]. Patients' withdrawal may further affect their rehabilitation and recovery time, and may even result in increased hospital costs due to, for example, prolonged treatment and longer hospital stay [10, 13, 14]. It is also important to consider that CCU patients are a heterogeneous group and that their levels of consciousness, physical strength, fatigue and/or cognitive impairment (especially delirium) may have an impact on their communication [15].

Communication with critically ill and communication-vulnerable patients could be achieved using alternative strategies such as speaking valves, interpretation of facial expressions, head nods, lip reading and mouthing, gestures, communication boards, speech-generating devices, and writing or typing [16, 17]. Alternative communication strategies have been used with communication-vulnerable patients in CCUs all over the world to improve nurse-patient communication [18-21]. Patients reported that they were more satisfied and less stressed about their treatment when alternative communication strategies were implemented during their stay in the CCU [11, 13, 18]. However, in a study done in the United Kingdom [22] it was found that although assistive communication devices

Running title: Nurses perspectives on alternative communication strategies

were available in CCUs, they were hardly ever used, and nurses still opted for unaided communication strategies such as lip reading and mouthing.

2 Background

The present study was conducted in South Africa, a country that has a pluralistic healthcare system with separate public and private sectors. This means that both Third and First World health conditions are encountered among the population [23]. The higher incidence of acute and chronic disease (notably HIV/AIDS), as well as high levels of violence affect the acuity of illness and injury, and these consequently increase the number of patients admitted to CCUs [24]. Healthcare services focus on increasing the number of critical care beds, while healthcare professionals focus on providing quality and safe care to critically ill patients. Although the majority of South Africans have access only to public hospitals, a mere 23% of public hospitals have CCUs, as opposed to 84% of private hospitals [25]. Of the national total of about 4168 intensive care or high-care beds, 43% are in the public sector and 57% in the private sector [25]. The CCU bed-to-total hospital bed ratio is 2.2% in public and 14.3% in private hospitals [26]. The current study sampled professional nurses from Gauteng – one of the three provinces in South Africa that collectively have more than 80% of the available CCU beds [25] (49% of these beds are in Gauteng) [26, 27]. To date, limited research has been done on the use of alternative strategies in nurse-patient communication in South African CCUs. A pilot study in a public hospital in Gauteng that investigated nurses' perspectives on the use of a communication board in a CCU suggested that nurses agreed on the importance of nurse-patient communication in the CCU [28]. However, the authors found that despite nurses having been trained on the use of a communication board in the CCU setting, only limited implementation of this type of board was observed [28]. Since alternative communication strategies are used only to a limited degree in South African hospitals, it was important to determine the perspectives of South African nurses regarding the potential clinical implementation of such strategies in CCUs.

3 Methods

3.1 Study design and aim

This study adopted a non-experimental descriptive survey design aimed at determining the perspectives of South African nurses working in CCUs of private and public hospitals on the following three issues: (i) the frequency of patients' need to communicate with nurses; (ii) the reasons why nurses communicate with patients; and (iii) the alternative strategies currently used by critically ill adult patients to communicate with nurses.

3.2 Setting and sample

Participants were professional nurses working in adult CCUs. They met the study's inclusion criteria if they were professional nurses who had worked for a minimum of six months in an adult CCU in either a private or public hospital in Gauteng. Convenience sampling was used as one of the authors had access to the professional nurses enrolled on a critical care program. These nurses were working in approximately 26 different hospitals, including all three major private hospital groups and hospitals in the public sector. A total of 346 professional nurses who were enrolled for the specific postgraduate critical care program during the time of data collection were invited to participate in the survey. The sample size for the study was 216 from a population total of 364. From the 216 distributed questionnaires, 214 responses were received resulting in the response rate of 99.07%.

3.3 Research instrument and data collection

A participant information leaflet was shared and discussed with the nurses, and once informed consent was obtained, data collection was performed over a period of seven months (November 2016 to May 2017). The questionnaire (see Appendix A) that was administered to collect data used a four-point Likert scale (always, frequently, occasionally, never) and had been adapted from a questionnaire by Gropp et al. [28] and Patak et al. [21]. Section A requested the participants' biographical information, while Section B focused on different communication aspects between nurses and patients

Running title: Nurses perspectives on alternative communication strategies

(i.e. patients' need to communicate; reasons for nurses to communicate with critically ill patients; and current alternative communication strategies used by critically ill adult patients in the CCU).

The questionnaire was piloted with four professional nurses, all of whom are experts in the field of critical care nursing (M = 16 years' experience; range 5 to 25 years' experience). The CCU nursing experts commented on and confirmed the suitability and appropriateness of the instrument for the South African critical care setting. Minor changes were made with regards to terminology. As the general accepted rule is that α of 0.6-0.7 indicates an acceptable level of internal consistency reliability [29], the Cronbach alpha of 0,61 obtained for the 13 questions measured with a Likert scale showed that the instrument had sufficient internal consistency. Participants received a hard copy of the questionnaire which was hand delivered for completion. The completed questionnaires were submitted by the participants after a contact session for data capturing.

3.4 Ethical considerations

This study received ethics approval from the Faculty of Health Sciences of the specific institution for higher education (Reference number: 397/2016), and permission to conduct the study was obtained from the head of department of the nursing education institution involved. The professional nurses were informed that participation was voluntary and that their postgraduate studies would not be affected if they opted not to participate. Participants consented through completing the questionnaire, which ensured confidentiality and anonymity. One of the researchers had access to the professional nurses enrolled, but she did not influence their participation in the study.

3.5 Data analysis

The collected data were coded and captured on an Excel spreadsheet that was further analyzed using Statistica software to organize, analyze and summarize the results in a scientifically meaningful way. In order to achieve the aim of the study, the results were presented according to participants' current work settings, namely private and public hospitals. Comparisons were subsequently drawn, and conclusions were reached. Quantitative descriptive and inferential statistics were applied to analyze the data and draw conclusions. The study applied descriptive statistics to determine the

Running title: Nurses perspectives on alternative communication strategies

perspectives of participants from private and public hospitals on the use of alternative communication strategies. Frequencies and percentages were used to summarize the results of each item being analyzed. Inferential statistics, namely the chi-square test, were applied to test the level of association between the different perspective and participants' work setting. A chi-square test was applied to test the level of association between demographic information, such as gender, age, language, work setting (private and public hospital), and categorical data about nurses' perspectives.

In order to perform statistical analysis, hypotheses were formulated for the data obtained. Based on the information obtained from the nurse participants, a two-sided hypothesis was posed as the alternative hypothesis, as it was assumed that the perspectives of nurses working in private hospitals would differ percentage-wise from those of nurses working in public hospitals:

H_0 : There is no significant difference between the perspectives of nurses working in private and public hospitals.

H_1 : There is a significant difference between the perspectives of nurses working in private and public hospitals.

4 Results

Altogether, 214 (62%) of the potential 346 participants consented to participate. Four of the 214 questionnaires were excluded as the answers were incomplete. As a result, 210 questionnaires were included for data analysis. More participants worked in the CCUs of private hospitals (70%) than of public hospitals (30%), and thus the statistician ran an analysis with equal sample sizes, i.e. $N = 62$ for both private and public hospitals on a total of 124 to see how these results differed on equal sample sizes. No significant difference was found, as the same conclusion was reached with data with equally sized samples [30, 31]. In fact, the current test confirmed greater reliability, since 90% of the results remained the same when the analysis was run with another set of sample sizes from the same data set. The results of the study were eventually presented using the original numbers of the data set.

Table 1 reflects the biographical information of the participants ($N=210$) according to their work setting.

Table 1 shows that the majority of the 210 participants were female (90%) and working in private hospitals (70%). The participants working in private hospitals had a mean age of 36 years (between 23 and 53 years old), while the age of participants working in public hospitals ranged between 25 and 55 years ($M=37$). In both private and public hospitals, the participants' clinical CCU experience ranged from 1 to 20 years ($M = 6.07; 5.42$ respectively), with the majority having worked in a CCU for three years. The first language of participants represented all of the 11 official languages of South Africa, and also included French and Malayalam (a language native to India). For the demography of participants, such as gender (chi-square test = 0.8238; $df = 1$; p -value = 0.3640); language (chi-Square test = 21.0726; $df = 13$; p -value = 0.0715), and years' of nursing experience working in CCU (chi-square test = 25.3358; $df = 23$; p -value = 0.3332), the observed number of participants did not differ significantly from what would have been expected between participants from private and public hospitals for each category, since p -values were greater than 0.05. Conversely, age of participants showed a significant difference between observed and expected frequencies in each age category between private and public hospitals (chi-square = 52.4454; $df = 32$; p -value = 0.0127). The results thus showed that the demographic information of participants working in private and public hospital did not differ significantly, except for age.

Table 2 presents a summary of the frequency, percentage, and p -values (and the significance of their difference) of the perspectives of participants working in private and public hospitals regarding their communication with critically ill patients. The table shows the participants' perspectives on (i) the frequency of patients' needs to communicate with nurses; (ii) the reasons why nurses communicate with patients; and (iii) the alternative strategies currently used by critically ill adult patients to communicate with nurses.

No statistically significant difference (chi-square = 5.53818, $df = 4$; $p = 0.236$) was found between the responses of participants working in private and public hospitals on patients' need to

Running title: Nurses perspectives on alternative communication strategies

communicate with nurses. From the total of 170 participants, 18 (10.6%) were of the opinion that critically ill patients do not need to communicate, or only need to communicate occasionally. Eleven of these 18 participants (6.4%) were working in private hospitals and 7 (4.1%) in public hospitals.

The results show that, with regard to obtaining information about patients' health history as the reason for nurses' communication with patients, there was a statistically significant difference in respect of nurses working in private and public hospitals (chi-square = 12.2922; df = 4; p = 0.0153). For example, nurses in private hospitals were significantly more likely to perceive communication as being used to (i) obtain information relating to patient's history. Conversely, there was no statistically significant difference between private and public hospitals relating to nurses' communication with patients to determine the latter's (ii) level of understanding (chi-square = 1.94788; df = 3; p-value = 0.583), (iii) pain levels (chi-square = 3.92292; df = 4; p-value = 0.417) and (iv) needs (chi-square = 9.21961; df = 4; p-value = 0.056). This was evident from the fact that the p-values were greater than 0.05 and chi-square test did not fall within the rejection region.

There was no significant difference ($p > 0.05$) between nurses working in private and public hospitals in respect of the perceived reasons for the breakdown in communication that occurred between nurses and critically ill patients. There was also no significant difference between nurses working in private and public hospitals in terms of the reported frequency of caring for communication-vulnerable patients who could not (i) understand English or other languages spoken to them (chi-square = 0.696045; df = 1; p = 0.404); (ii) hear what nurses said due to hearing impairments (chi-square = 0.289997; df = 1; p = 0.590); (iii) speak due to communication disability (chi-square = 0.000598; df = 1; p = 0.980); or (iv) speak due to medical intervention, such as an endotracheal or tracheostomy tube (chi-square = 0.927451, df = 1; p = 0.336).

There was no significant difference between nurses working in private and public hospitals in terms of the reported frequency of patients' communication through the use of (i) pen and paper to write messages ($n = 129$; 67.89%; $n = 52$; 27.37%; chi-square = 4.96599; df = 4; p = 0.291); (ii) facial

Running title: Nurses perspectives on alternative communication strategies

expressions ($n = 124$; 65.26%; $n = 55$; 28.96%; chi-square = 2.25969; $df = 4$; $p = 0.688$), and (iii) signs and gestures ($n = 103$; 55.08%; $n = 48$; 25.76%; chi-square = 3.81162; $df = 4$; $p = 0.432$).

There was no significant difference between nurses working in private and public hospitals in terms of the reported frequency of the use of electronic speech-generating devices ($n = 119$; 71.26%; $n = 48$; 28.74%; chi-square = 4.86511; $df = 4$; $p = 0.301$) and speaking valves ($n = 119$; 70.83%; $n = 49$; 29.17%; chi-square = 2.90310; $df = 4$; $p = 0.574$). However, there was a statistically significant difference between nurses working in private and public hospitals in terms of the reported frequency of the use of communication boards ($n = 124$; 71.26%; $n = 50$; 28.74%; chi-square = 15.2206; $df = 4$; $p = 0.004$). Limited use (occasionally, seldom, never) of communication boards was reported ($n = 43$; 86%) in public hospitals.

5 Discussion

This study aimed to explore the perspectives that nurses working in the CCUs of private and public hospitals held on the use of alternative communication strategies to support patient-centered communication with critically ill adult patients. A response rate of 62% was achieved, which could be attributed to the fact that the second author was actively involved in collaborative research projects. Valuable relationships with healthcare professionals in the critical care environment had also been developed over a period of 25 years in the critical care environment in South Africa. The participants' years of experience in critical care ranged from one to 20 years, which supports the notion that professional nurses work in the CCU in South Africa for many years before commencing a postgraduate qualification in critical care. The rationale may be that a limited number of professional nurses are given study leave to pursue postgraduate studies, as it places additional stress on the nurses left behind to continue the work in the CCU [27]. In South Africa, professional nurses are allowed to work in the CCU without a critical care postgraduate qualification.

Although the participants' first language was representative of the 11 official languages of South Africa, English continues to be the main language used officially and unofficially in healthcare settings in South Africa [32-34]. The likelihood of healthcare professionals (such as nurses) and their

patients not speaking the same first language and having to communicate in English as a second or third language might also influence communication between the two parties [34, 35]. This difference between English typically used in South African hospital settings and the first language of patients could also affect a patient's right to communicate, as declared by Section 2 in Article 19 of the United Nation's Universal Declaration of Human Rights [1, 35]. Blackstone's [9] definition of communication vulnerability includes patients with limited proficiency in the language spoken by healthcare professionals and the subsequent risk of communication breakdown during medical encounters.

5.1 Patients' need to communicate with nurses

A question on patients' need to communicate with nurses was asked to participants in both the Gropp study [28] and in the current study – both of which were conducted in South Africa. In alarming contrast to the findings of Gropp's study, where all nurses (100%) agreed on the importance of nurse-patient communication in CCUs [28], results from the current study revealed that 10.6% (n=18) of the participants from both private and public settings were of the opinion that critically ill patients do not need to communicate, or only need to communicate occasionally. When nurses do not perceive communication with patients as essential, this may affect nurse-patient relationships and also deny patients their human right to communicate [1, 5, 36]. Furthermore, if the nurse does not involve the critically ill patient by means of alternative communication strategies, shared decision making is not possible [3]. This also implies that neither patients' input and experiences of their illness, nor their specific needs are taken into account while their condition is being managed [37]. Ineffective communication may furthermore compromise the positive continuity of patient care, patient safety and health outcomes [11, 36]. Therefore, it is vital to understand the value and importance of patient-centered communication.

5.2 Reasons why nurses communicate with patients

Findings in support of the results revealed two statistically significant differences in the extent to which each group perceived the need to communicate with critically ill patients: to obtain health

history information from patients and to determine the patients' needs. Other studies, furthermore, found that communication with critically ill patients is necessary to manage the latter's health optimally [5, 14, 38]. Nurses need to obtain information from patients about their health history to ensure individualized and appropriate interventions [6, 37]. Through communication, nurses are able to provide patient care with humanity and respect, based on the patients' needs and preferences [6, 39].

5.3 Existing communication strategies used by critically ill patients

Results from this study confirm that the perspectives of nurse participants regarding communication with critically ill patients in South African CCUs are consistent with global findings over the past 30 years [5]. Although no statistically significant differences were found between the perspectives of nurses working in the two types of hospital settings, the three communication strategies primarily used in CCUs in both private and public South African hospitals were (i) written messages using pen and paper; (ii) facial expressions, and (iii) signs and gestures. When pen and paper is implemented as a communication strategy with critically ill patients, the individual's language proficiency, literacy and physical strength should be taken into consideration. Cavaco et al. [17] highlighted that nurses should ensure that they are properly positioned during the nurse-patient communication to enable their understanding of the patient's communication attempts and limit the potential of misinterpreting patients' facial expressions, signs and gestures. Inaccurate interpretation of a patient's communication could result in inappropriate treatment.

In identifying potential barriers to the use of alternative strategies, such as electronic speech-generating devices and communication boards, Carruthers [19] suggests that hospital staff may consider them too bulky and that the slow speed of communication likely influences staff who are under time constraints. Furthermore, due to a lack of training, staff members might be unaware of the availability of alternative equipment when communicating with patients in CCUs [17, 19, 28].

Literature on the use of communication boards in CCUs in South Africa seems to be limited. The pilot study done by Gropp et al. [28] in South Africa revealed that nurses did not use a

communication board when communicating with critically ill patients in the CCU, despite the fact that nurses agreed on the importance of effective communication with critically ill patients to avoid adverse medical outcomes. Findings from a study done in Botswana, a neighboring country to South Africa, indicate that no alternative communication strategies (e.g. communication boards, pen and paper) were used in the CCU, despite the fact that they were available [40].

The selection of a method of communication should be guided by individual patients' needs [41]. For example, the severity of a patient's illness, their level of consciousness, degree of responsiveness, understanding of the English language, and literacy skills, may all influence their preference of the type of communication board to be used. The use of electronic speech-generating devices and picture-based communication boards rather than words, phrases or alphabet boards to facilitate communication may be preferred by critically ill patients, as understanding pictures may be less demanding than reading words [5, 41]. To enable nurses to improve communication with critically ill patients, communication training to implement their augmentative and alternative communication strategies in CCUs is recommended [17, 28]. It is further suggested that the right of critically ill patients to communicate should be emphasized in such a nurse training program.

6 Limitations and Directions for Future Research

Results should be handled with caution as this study was conducted with a convenience sample of professional nurses working in one province in South Africa, who were enrolled in a post-qualification critical care course at one nursing institute. As such, professional nurses from other provinces and institutes in South Africa did not have the opportunity to participate – thus the results may not be generalizable. It is, furthermore, a concern that some participants were of the opinion that critically ill patients do not need to communicate, or only need to communicate occasionally. Therefore, a follow-up study is suggested to determine the importance of communication as perceived by nurses working in CCUs. Furthermore, the cultural relevance of available CCU communication boards (e.g. the Vidatak EZ boards) in the South African context should be determined, in an attempt to address the sustainable use of alternative communication strategies.

The use of speech-generating devices or tablets with communication applications within South African CCUs should also be investigated in future research. For example, a quasi-experimental nonequivalent control group pre-test post-test design could be used. The experimental group could receive training on the implementation of speech-generating devices or tablets with communication application *after* having completed the pre-test and *before* completing the post-test. The control group, made up of participants with similar characteristics, would have to complete both the pre-test and post-test before also receiving the same training that the experimental group had undergone before completing the post-test. Ethically, this would be important so as not to deprive them from receiving training simply because they happen to be in the control group.

7 Conclusion

The findings of this study contribute to the body of knowledge regarding the perspectives of nurses working in CCUs in private and public hospitals on the use of alternative communication strategies in South Africa. The study failed to reject the null hypothesis that there is no significant difference between the perspectives of nurses working in private and public hospitals regarding patients' needs to communicate and patients' current communication strategies with nurses. However, there is enough evidence to reject the hypothesis that there are no significant differences between the perspectives of nurses working in private and public hospitals regarding the reasons for nurses' communication with patients. The results support global findings that the majority of nurses communicate with patients by means of pen and paper, facial expressions, and signs and gestures. Two main reasons highlighted by nurses for communication with patients were to obtain information regarding their health history and to determine their needs. Communication was therefore perceived as a way to enhance respect and promote individualized care, based on patients' needs and preferences. The researchers therefore propose that critically ill patients' right to communicate be included in a nurse training program on the use of alternative communication strategies between nurses and communication-vulnerable patients. The use of alternative communication strategies such as communication boards, speech-generating devices and tablets with communication applications may also enable critically ill and communication-vulnerable patients to express their basic needs.

References

1. United Nations, *Universal Declaration of Human Rights* 1948.
2. McLeod, S., *Communication rights: Fundamental human rights for all*. International Journal of Speech-Language Pathology, 2018. 20(1): p. 3-11.
3. Ten Hoorn, S., et al., *Communicating with conscious and mechanically ventilated critically ill patients: a systematic review*. Critical Care, 2016. 20(1): p. 333.
4. Vincent, J., et al., *Comfort and patient-centred care without excessive sedation: the eCASH concept*. Intensive Care Medicine, 2016. 42: p. 962-971.
5. Happ, M.B., et al., *Nurse-patient communication interactions in the intensive care unit*. American Journal of Critical Care, 2011. 20(2): p. e28-e40.
6. Jansson, S., et al., *Healthcare professionals' use of augmentative and alternative communication in an intensive care unit: A survey study*. Intensive and Critical Care Nursing, 2019. 54: p. 64-70.
7. Alasad, J. and M.A. Ahmad, *Communication with critically ill patients*. Journal of Advanced Nursing, 2005. 50(4): p. 356-362.
8. Pakmehr, M., et al., *Lived Experience of Intubated Patients: A Phenomenological Study*. Indian Journal of Public Health Research & Development, 2017. 8(1).
9. Blackstone, S.W., *Issues and challenges in advancing effective patient-provider communication*. , in *Patient-provider communication: Roles for speech=language pathologists and other healthcare professionals*, S.W. Blackstone, D.R. Beukelman, and Y. K.M., Editors. 2015, Plural Publishing: San Diego.
10. McGrath, B., et al., *Above cuff vocalisation: A novel technique for communication in the ventilator-dependent tracheostomy patient*. Journal of the Intensive Care Society, 2016. 17(1): p. 19-26.
11. Foà, C., et al., *Communications and relationships between patient and nurse in Intensive Care Unit: knowledge, knowledge of the work, knowledge of the emotional state*. Acta Bio Medica Atenei Parmensis, 2016. 87(4-S): p. 71-82.
12. Happ, M.B., et al., *Effect of a multi-level intervention on nurse-patient communication in the intensive care unit: results of the SPEACS trial*. Heart & Lung: The Journal of Critical Care, 2014. 43(2): p. 89-98.
13. Hemsley, B. and S. Balandin, *A metasynthesis of patient-provider communication in hospital for patients with severe communication disabilities: Informing new translational research*. Augmentative and Alternative Communication, 2014. 30(4): p. 329-343.
14. Falk, A.-C., A. Schandl, and C. Frank, *Barriers in achieving patient participation in the critical care unit*. Intensive and Critical Care Nursing, 2019. 51: p. 15-19.
15. Holm, A. and P. Dreyer, *Nurse-patient communication within the context of non-sedated mechanical ventilation: A hermeneutic-phenomenological study*. Nursing in Critical Care, 2018. 23(2): p. 88.

16. Salem, A. and M.A. Ahmad, *Communication with invasive mechanically ventilated patients and the use of alternative devices: integrative review*. Journal of Research in Nursing, 2018. 23(7): p. 614-630.
17. Cavaco, V.S.J., H.M.G. José, and I.M.R. Lourenço, *Communicating with the person undergoing invasive mechanical ventilation: What are the strategies? A systematic review* Journal of Nursing UPFE Online, 2013. 7(6): p. 4535-4543.
18. Bradbury-Jones, C., et al., *Promoting the health, safety and welfare of adults with learning disabilities in acute care settings: a structured literature review*. Journal of Clinical Nursing, 2013. 22(11-12): p. 1497-1509.
19. Carruthers, H., F. Astin, and W. Munro, *Which alternative communication methods are effective for voiceless patients in Intensive Care Units? A systematic review*. Intensive and Critical Care Nursing, 2017.
20. Mesko, P.J., et al., *Use of picture communication aids to assess pain location in pediatric postoperative patients*. Journal of PeriAnesthesia Nursing, 2011. 26(6): p. 395-404.
21. Patak, L., et al., *Communication boards in critical care: patients' views*. Applied Nursing Research, 2006. 19(4): p. 182-190.
22. Mobasheri, M.H., et al., *Communication aid requirements of intensive care unit patients with transient speech loss*. Augmentative and Alternative Communication, 2016. 32(4): p. 261-271.
23. Rowe, K. and K. Moodley, *Patients as consumers of health care in South Africa: the ethical and legal implications*. BMC Medical Ethics, 2013. 14(1): p. 15.
24. Kisorio, L., S. Schmollgruber, and P. Becker, *Validity and reliability of the simplified therapeutic scoring system in intensive care units of a public sector hospital in Johannesburg*. South African Journal of Critical Care, 2009. 25: p. 36-43.
25. Joynt, G.M., et al., *The critical care society of Southern Africa consensus statement on ICU triage and rationing (conictri)*. Southern African Journal of Critical Care (Online), 2019. 35(1): p. 36-52.
26. Naidoo, K., J. Singh, and U. Laloo, *Critical analysis of ICU/HC beds in South Africa: 2008-2009*. South African Medical Journal, 2013. 103(10): p. 751-753.
27. De Beer, J., P. Brysiewicz, and B.R. Bhengu, *Intensive care nursing in South Africa*. Southern African Journal of Critical Care, 2011. 27(1): p. 6-10.
28. Gropp, M., et al., *Nurses' perspectives toward patient communication using a low technology communication board in an intensive care setting*. Health SA Gesondheid (Online), 2019: p. 1-9.
29. Ursachi, G., I.A. Horodnic, and A. Zait, *How reliable are measurement scales? External factors with indirect influence on reliability estimators*. Procedia Economics and Finance, 2015. 20: p. 679-686.

30. Rusticus, S.A. and C.Y. Lovato, *Impact of sample size and variability on the power and type I error rates of equivalence tests: A simulation study*. Practical Assessment, Research, and Evaluation, 2014. 19(1): p. 11.
31. Bolarinwa, O.A., *Principles and methods of validity and reliability testing of questionnaires used in social and health science researches*. Nigerian Postgraduate Medical Journal, 2015. 22(4): p. 195.
32. Wright, S.C., T.T. Biya, and M.E. Chokwe, *The effectiveness of a pregnancy leaflet to promote health in Tshwane, South Africa*. Health SA Gesondheid (Online), 2014. 19(1): p. 01-07.
33. Deumert, A., *'It would be nice if they could give us more language'—Serving South Africa's multilingual patient base*. Social Science & Medicine, 2010. 71(1): p. 53-61.
34. Hussey, N., *The language barrier: the overlooked challenge to equitable health care: Emerging Public Health Practitioner Awards*. 2012.
35. Pascoe, M., et al., *Beyond lip service: Towards human rights-driven guidelines for South African speech-language pathologists*. International Journal of Speech-Language Pathology,, 2018. 20(1): p. 67-74.
36. Larson, E., H.H. Leslie, and M.E. Kruk, *The determinants and outcomes of good provider communication: a cross-sectional study in seven African countries*. BMJ Open, 2017. 7(6): p. e014888.
37. Handberg, C. and A.K. Voss, *Implementing augmentative and alternative communication in critical care settings: Perspectives of healthcare professionals*. Journal of Clinical Nursing, 2018. 27(1-2): p. 102-114.
38. Choi, J., et al., *Symptom assessment in non-vocal or cognitively impaired ICU patients: Implications for practice and future research*. Heart Lung, 2017. 46(4): p. 239-245.
39. Huang, C., et al., *Developing and testing the patient-centred innovation questionnaire for hospital nurses*. Journal of Nursing Management, 2017.
40. Dithole, K., et al., *Exploring Communication Challenges Between Nurses and Mechanically Ventilated Patients in the Intensive Care Unit: A Structured Review*. Worldviews on Evidence-Based Nursing, 2015.
41. Zhen, S.S.S., C. McCulloch, and D. Swann, *Communication with ventilated patients in ICU: Perceptions on existing communication methods and needs*. RES Medica, 2015. 23(1): p. 1-14.

Table 1

Biographical Information of participants (N=210)

	Private Hospital		Public Hospital		Total		Chi-square	df**	p-value
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%			
(i) Work setting	148	70%	62	30%	210	100			
(ii) Gender							0.8238	1	0.3640
Male	13	6%	8	4%	21	10%			
Female	135	64%	54	26%	189	90%			
Total	148	70%	62	30%	210	100%			
(iii) Language							21.0726	13	0.0715
Afrikaans	33	16%	11	5%	44	21%			
English	16	8%	3	1%	19	9%			
French	1	0%	0	0%	1	0%			
isiNdebele	4	2%	2	1%	6	3%			
isiXhosa	9	4%	8	4%	17	8%			
isiZulu	23	11%	4	2%	27	13%			
Sepedi	30	14%	12	6%	42	20%			
Sesotho	8	4%	5	2%	13	6%			
Setswana	16	8%	5	2%	21	10%			
SiSwati	1	0%	4	2%	5	2%			
Tshivenda	2	1%	4	2%	6	3%			
Xitsonga	4	2%	3	1%	7	3%			
Malayalam (Indian language)	1	0%	0	0%	1	0%			
Language not indicated (missing data)	0	0%	1	0%	1	0%			
Total	148	70%	62	30%	210	100%			
	Mean	Range	Mean	Range					

Running title: Nurses perspectives on alternative communication strategies

	Private Hospital		Public Hospital		Total		Chi-square	df**	p-value
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%			
	Private hospital		Public hospital						
(iv) Age	36.49	(23 – 53)	37.07	(25-55)			52.4454	32	0.0127*
(v) Years of nursing experience working in CCU	6.07	(1-20)	5.42	(1-20)			25.3358	23	0.3332

Note: *p<0.05 **df=Degrees of Freedom

Table 2

Summary of nurse participants' perceptions on existing communication in CCU

	Private Hospital		Public Hospital		Total		Chi-square	df**	p-value
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%			
(i) Patient need to communicate with nurses (n=170)									
Always	74	60.7	32	66.7	106	62.4	5.53818	4	0.236
Frequently	37	30.3	9	18.8	46	27.1			
Occasionally	7	5.7	2	4.2	9	5.3			
Never	4	3.3	5	10.4	9	5.3			
Total	122	100.0	48	100	170	100.0			
(ii) Reasons for nurses' communication with patients									
<i>To obtain information relating to patients' health history (n=207)</i>							12.2922	4	0.0153*
Always	118	80.8	47	77.0	165	79.71	12.2922	4	0.0153*
Frequently	20	13.7	5	8.2	25	12.08			
Occasionally	7	4.8	9	14.8	16	7.73			
Never	1	0.7	0	0.0	1	0.48			
Total	146	100.0	61	100	207	100.00			
<i>To determine patients' understanding (receptive) (n=205)</i>							1.94788	3	0.583
Always	116	80.0	43	71.7	159	77.6	1.94788	3	0.583
Frequently	22	15.2	12	20.0	34	16.6			
Occasionally	6	4.1	4	6.7	10	4.9			
Never	1	0.7	1	1.7	2	0.9			
Total	145	100.0	60	100.0	205	100.0			
<i>To determine patients' pain levels (n=207)</i>							3.92292	4	0.417
Always	121	82.3	45	75.0	166	80.19	3.92292	4	0.417
Frequently	24	16.3	12	20.0	36	17.39			
Occasionally	2	1.4	2	3.3	4	1.94			

	Private Hospital		Public Hospital		Total		Chi-square	df**	p-value
	n	%	n	%	n	%			
Never	0	0.0	1	1.7	1	0.48			
Total	147	100.0	60	100.0	207	100			
<i>To determine patients' needs (n=207)</i>							9.21961	4	0.056*
Always	126	86.3	45	73.8	171	82.61			
Frequently	18	12.3	12	19.7	30	14.49			
Occasionally	2	1.4	3	4.9	5	2.42			
Never	0	0.0	1	1.6	1	0.48			
Total	146	100.0	61		207	100			
(iii) Current communication strategies that conscious, mechanically ventilated patients use with nurses									
<i>Patients write message (pen and paper) (n=190)</i>							4.96599	4	0.291
Always	26	19.5	10	17.5	36	18.95			
Frequently	42	31.6	12	21.1	54	28.42			
Occasionally	61	45.9	30	52.6	91	47.89			
Never	4	3.0	5	8.8	9	4.74			
Total	133	100.0	57	100.0	190	100			
<i>Patients use communication boards (n=174)</i>							15.2206	4	0.0004*
Always	13	10.5	4	8.0	17	9.8			
Frequently	18	14.5	3	6.0	21	12.0			
Occasionally	57	46.0	13	26.0	70	40.2			
Never	36	29.0	30	60.0	66	38.0			
Total	124	100	50	100	174	100.0			
<i>Patients use electronic devices (n=167)</i>							4.86511	4	0.301
Always	5	4.2	2	4.2	7	4.2			
Frequently	6	5.0	3	6.3	9	5.4			
Occasionally	27	22.7	5	10.4	32	19.2			
Never	81	68.1	38	79.2	119	71.3			
Total	119	100.0	48	100.0	167	100.0			

Running title: Nurses perspectives on alternative communication strategies

	Private Hospital		Public Hospital		Total		Chi-square	df**	p-value
	n	%	n	%	n	%			
<i>Patients use signs or gestures (n=187)</i>							3.81162	4	0.432
Always	16	15.7	8	13.6	24	12.8			
Frequently	30	29.4	21	35.6	51	27.3			
Occasionally	31	30.4	19	32.2	76	40.5			
Never	25	24.5	11	18.6	36	19.3			
Total	102	100.0	59	100.0	187	99.9			
<i>Patients use facial expressions (n=190)</i>									
Always	36	27.7	19	31.7	55	29.0			
Frequently	49	37.7	21	35.0	70	36.8			
Occasionally	39	30.0	15	25.0	54	28.4			
Never	6	4.6	5	8.3	11	5.8			
Total	130	100.0	60	100.0	190	100.0			
<i>Patients use speaking valves (n=168)</i>							2.90310	4	0.574
Always	2	1.7	2	4.1	4	2.4			
Frequently	4	3.4	0	0.0	4	2.4			
Occasionally	32	26.9	11	22.4	43	25.6			
Never	81	68.1	36	73.5	117	69.6			
Total	119	100.0	49	100.0	168	100.0			

Note: *p<0.05 **df=Degrees of Freedom