Knowledge, Attitudes, and Practices of Nurses towards Oral Care of Hospitalized Patients in Zimbabwe

Fiona Makoni[1], Cleopatra Matanhire-Zihanzu[1], Timothy Chifamba [2*], Lilian Gertrude Dodzo[3], and Mordester Mutimukulu[3]

1. Faculty of Medicine and Health Sciences, University of Zimbabwe, Zimbabwe
2. Oral Health Services Department, Ministry of Health and Childcare, Zimbabwe
3. Nursing Services Department, Ministry of Health and Childcare, Zimbabwe

Abstract

Background: This study aimed to evaluate oral healthcare knowledge, attitudes, and management of admitted patients by Registered General Nurses (RGNs). It sought to appreciate the scope of training in the oral health management of patients using RGNs and the knowledge, attitudes, and practices of RGNs in managing oral and maxillofacial conditions in admitted patients.

Methods: This descriptive cross-sectional study used systematic random sampling to collect data using questionnaires at Parirenyatwa Hospital, Harare. One hundred and one RGNs participated in this study.

Results: The overall knowledge level of RGNs regarding oral and maxillofacial management of admitted patients was average. In addition, their general attitude regarding the oral and maxillofacial management of admitted patients was good, but their overall practice was considered fair.

Conclusion: These results show a disparity, with generally lower practices than self-perceived attitudes. Nurses should be equipped with a basic package of oral care for admitted patients through collaboration between oral health professionals and nursing professionals in research, training, and service.

***Keywords*:** Oral health, oral care, nurses, hospitalized patients, dentistry, public health, health promotion, Zimbabwe

Introduction

As a lower-middle-income country, Zimbabwe is largely a resource-constrained setting (World Bank, 2019). In such a setting, the World Health Organization (WHO) and other scholars recommend that primary healthcare workers be equipped with a basic package for oral care (Frencken et al., 2002; Kundabala et al., 2022; Reddy et al., 2017; Satyarup et al., 2020; World Health Organization, 2020). In the context of oral care, typical problems in the healthcare sector include the lack of sufficient knowledge to conduct proper oral health assessments, lack of ability to provide oral health hygiene instructions, and reluctance to refer hospitalized patients to oral care. The mouth is the window of the body. Hence, failure to attend to it results in a high proportion of untreated oral diseases

*Corresponding author. Email: tchifg@gmail.com

and complications in the management of hospitalized patients. Admitted patients are especially at risk when their hospital stay is prolonged because inconsistent oral care may result in cognitive impairment, pneumonia, kidney failure, cardiovascular disease, obesity, miscarriage, premature delivery and delivery to underweight babies (Basha et al., 2018; Dörfer et al., 2017; Mizutani et al., 2020; Khadka et al., 2020; Olsen & Singhrao, 2019; Yenen & Ataçağ, 2019). In the case of patients scheduled for oral and maxillofacial surgery, when there is poor oral care, surgical management and treatment may fail due to complications such as prolonged recovery from illness, sepsis, and poor healing (Dryden et al., 2013; Politis et al., 2016).

Due to the shortage and lack of recognition of oral health personnel in dysfunctional health facilities within the public health system, a large proportion of the population has limited or no access to appropriate oral health care services. The nursing profession is appropriately placed to potentially be capable of offering basic oral health care to hospitalized persons to meet national needs.

Ideally, nurses make use of the 'Nursing Process,' which is an organized, scientific, and evidence-based approach towards provision of tailored, high-quality care to patients. Patient management is based on proper health assessments, problem identification, diagnosis, and care institution. Therefore, hospitalized patients must receive appropriate oral care if the process is performed comprehensively. There is also a need to provide care based on clinical evidence. Hence, there is a need to conduct scientific inquiry to improve the quality of patient care and professional excellence (Toney-Butler & Thayer, 2022).

Trained oral health professionals are few in southern Africa. In such a resource-constrained context, it is not ideal to use the same models for oral health provision that are utilized in developed countries. Oral health professionals cannot provide oral care at all levels of the health delivery system (Azevedo et al., 2019). Task-shifting through the integration of oral health into primary healthcare delivery provides a potentially cost-effective way to improve the health of poor and disadvantaged population groups. This can be accomplished by providing additional preventative oral health training for non-dental health professionals such as medical doctors, nurses, and village health workers. Ultimately, this can result in a lower burden of oral diseases through a decrease in unmet oral health needs.

Problem Statement

Ideally, registered nurses should be able to provide oral care to hospitalized patients to meet international best practice standards. According to Knowledge, Attitude, and Practice Theory, practice is related to an individual's knowledge and attitudes. It has been posited that this is because

increased knowledge concerning a matter improves attitudes and practices (Kwak et al., 2022; Wang et al., 2020; Zheng et al., 2021). To the best of our knowledge, little to no research exists on registered general nurses' knowledge, attitudes, and practices regarding the oral care of hospitalized patients in Zimbabwe. An appreciation of the performance of Registered General Nurses (RGNs) at the largest hospital in the country will help assess the effectiveness and efficiency of primary health workers in their service provision regarding the oral health of hospitalized patients. This will clarify whether there is a need to change priorities by stakeholders in the integration of oral health as part of the well-being of hospitalized patients. If indicated, further training of nursing staff on oral management of patients can be performed, and improvements in the health workforce can be implemented to meet the demand in the health sector. Therefore, this study aimed to evaluate oral healthcare knowledge and management of admitted patients by RGNs.

Research Objectives

The broad objective of this study was to evaluate the knowledge, attitudes, and practices regarding oral health management offered by RGNs to admitted patients. Specific objectives were:

1. To examine the scope of training in oral health management of patients by RGNs.
2. To assess the knowledge of RGNs in oral and maxillofacial conditions of interest in public health.
3. To determine the current practices of oral health management of admitted patients by RGNs.

Literature Review

Nursing in Zimbabwe

The nursing profession was established more than a hundred years ago in Zimbabwe (Masakure, 2012). The goal of the Ministry of Health and Childcare Department of Nursing is to provide quality and comprehensive nursing services to rural and urban areas using the primary healthcare approach (Ministry of Health and Childcare, 2022).

Modern nursing was introduced in Zimbabwe in 1890 by Dominican Roman Catholics. During the colonial period, the nursing profession was led by European nurses, who formed the Rhodesia Nurses Association in 1964. Nurses also had to register with more than one professional body, including the Health Professions Council (Nursing Council of Zimbabwe, n.d.; Mapanga & Mapanga, 2000). Zimbabwe gained Independence in 1980. Since then, the profession has grown rapidly. The Nursing Council of Zimbabwe was established on April 2, 2001, under the Health Professions Act and now regulates and guides the profession (Nursing Council of Zimbabwe, n.d.).

The Nursing Council of Zimbabwe strives to uphold the highest standards

of the profession and aims to ensure international best practices. However, there is a gap in the integration of oral health into health care. Inadequate knowledge to conduct oral health risk assessments, screenings, and referrals is common among health professionals worldwide (Dickson-Swift et al., 2020). Oral health education and promotion are often not integrated by the nursing staff in the management of hospitalized patients. Admitted patients are especially at risk because inconsistent oral care may result in delayed or missed diagnosis of conditions despite good treatment plans for surgically managed maxillofacial patients. Treatment may fail due to complications, such as prolonged recovery from illness, sepsis, poor healing, feeding, and nourishment. Therefore, there is a great need to integrate oral health into nursing and the general practice of medicine (Atchinson, 2018).

The Link between Nursing and Oral Health in the Primary Health Care Approach

The need for a health package that addresses patients' oral health needs at the primary care level has been identified. The World Health Organization Package of Essential Noncommunicable Disease (WHO-PEN) for primary healthcare has been used to integrate the promotion of Oral Health in low-to middle-income countries through the Basic Package of Oral Care (World Health Organization, 2016). The Basic Package of Oral Care allows for simple and preventative oral health services to be conducted in resource-constrained settings through integration with primary healthcare services. Among other activities, the basic package of oral health includes oral health education, promotion of good oral hygiene, and addressing acute oral health conditions for pain relief. In areas where there is a high oral health professional-to-patient ratio, task-shifting to non-dental professionals should be considered to address the needs of the communities at the primary healthcare level. It has been posited that professionals such as medical doctors and nurses can be trained to offer services to address the unmet oral health needs of their patients and the community (Fisher et al., 2018).

Challenges faced when there are attempts to integrate oral health into primary healthcare include a lack of supportive leadership, absence of relevant health policies, and challenges with implementation of the concept. Enablers of the integration of oral care into primary care include the presence of supportive policies, adequate resource allocation, integration of oral healthcare in nursing curricula, and increased interdisciplinary complementary approaches between dental and non-dental healthcare professionals (Harnagea et al., 2017).

A study conducted in Canada demonstrated that while nursing professionals perceived themselves to be knowledgeable in terms of the provision of oral health care to their

patients when it came to practicing the knowledge by providing care to their patients, they lacked confidence and expressed a desire to improve their skills (Keboa et al., 2019). Estes et al. (2018) found that nursing practitioners often lack confidence in providing oral care to their patients, because the curriculum often overlooks oral health. The same study found that nursing practitioners' confidence increased after the completion of training in collaboration with oral health professionals.

Oral Care of Patients by Nurses in Sub-Saharan Africa

Kerr and Singh (2018) found that while nursing students in South Africa perceived their dental health to be excellent, they reported signs of gingival disease. The majority had not visited a dentist in the previous year. Furthermore, those who visit do so primarily for treatment of acute conditions and pain relief. These findings suggest that there is a need for a curriculum review to improve attitudes and a greater appreciation of the link between oral health and general health.

Msuya et al. (2017) have found that in Tanzania, nurses of all levels of education often carried out a large variety of "non-nursing duties." These include prescribing essential drugs and performing minor surgical procedures. This demonstrates that, in the sub-Saharan context, nurses often perform duties that are beyond their scope and training. Therefore, it is essential that all nurses be trained in all areas related to primary healthcare provision as a solution to the problem of limited health professionals with advanced, specialized training.

To the best of our knowledge, there is little to no research that has been done on the oral care of hospitalized persons in Zimbabwe. However, with few dental professionals, task shifting to nurses and allied health professionals often occurs (Calzavara, 2017). One may seek to determine the oral care provided by nurses and their knowledge and attitudes toward improving the health services provided.

Methodology

Research Design

This study utilized a cross-sectional descriptive study design and research method. This study design allowed the researchers to enter the field at a certain point in time, obtain a snapshot of the existing phenomenon, and report on what is, without any attempt to manipulate the existing phenomenon.

Research Setting

The study was conducted at the Parirenyatwa Hospital. It is the largest referral group in hospitals in Zimbabwe. Located in Harare, the country's capital city, the hospital serves as a quaternary service institution that caters to the advanced needs of patients from around the country.

Sampling

Systematic random sampling was used to select registered nurses. The inclusion criteria were registered general nurses who were diploma or degree holders at the time of the study and were working in all the hospital wards. The number of registered general nurses working in the hospital wards was 874. The target sample size was 90 registered general nurses. This size was computed based on Slovin's formula, with a margin of error of 10%. We anticipated a response rate of approximately 50%; therefore, we approached 175 registered nurses. First, a random number was selected using an Excel random number generator and every fifth nurse on the list was selected. Of the 175 registered general nurses targeted, 101 participated in the study. Thus, the response rate obtained was 57.7%.

Data Collection

We used a self-constructed questionnaire based on an extensive review of the existing literature. It consisted of 5-point Likert-scale questions on the knowledge, attitudes, and practices of oral care. After sampling was performed from the register of nurses working at the hospital, those selected through random sampling were approached at their workstations and asked to participate by filling in the questionnaire. Only those who signed the consent forms were included in the study.

Data Analysis

Descriptive statistics were used to analyze the survey findings. Correlation statistics were performed to determine whether there was a statistically significant correlation between variables. Responses to the Likert-type questions were encoded with numerical values ranging from 1-5. Specifically, 'strongly disagree' responses were coded as 1 and 'disagree' as 2. Responses of 'agree' were coded as 4 and 'strongly agree' as 5. The response 'I don't know' was considered neutral and coded as 3. Questions that were negatively phrased were reverse coded. The items that were reverse-coded included questions 1, 4, and 5 in the Attitudes section of the questionnaire. Questions 11 and 15 in the Knowledge section of the questionnaire which read, "There is only one correct technique for tooth brushing," and "The best way to clean a patient's teeth is by horizontal movement," were also reverse-coded. The encoded data were then exported to Jamovi Statistical Software, and descriptive statistics were used to measure the means of the responses. Where respondents skipped a question, the missing item was not included in the statistical analysis and computation of the means. The mean of the items was used to determine respondents' perceptions of each of the constructs: knowledge, attitudes, and practices. Each item contributed equally to the weighted means of each construct. Table 1 shows the intervals used to score the weighted means of each construct and verbal interpre-

tation. This interpretation is based on the need to avoid biases introduced when the intervals in the upper and lower ranges are smaller than the middle ones. Thus, equal differences (0.79) were used in each interval, except for the highest interval, which had a range of 0.80 (Pimentel, 2019).

The final section of the questionnaire consisted of six open-ended questions. The responses to each question were coded into a spreadsheet, and computer-aided coding was performed. First, a word crunch was run on "Atlas.ti" software, and keywords recurring in each response were extracted. These were used to highlight the emerging themes. We then reviewed all responses and categorized them into thematic areas. A tally was then conducted on the number of responses highlighting each theme. When a response included more than one theme area, it was included in the tally for both theme areas.

Ethical Considerations

Permission to conduct the study was obtained from the Parirenyatwa Group of Hospitals where this study was conducted. Ethical clearance was obtained from the Joint Research Ethics Committee (JREC) and the Medical Research Council of Zimbabwe (MRCZ). Written informed consent was obtained from the registered general nurses. Only those who agreed to participate were included in this study.

Results

Of the 175 nurses approached, 101 participated in the study; therefore, the response rate was 57.7%. The first section of the research instrument examined the respondents' sociodemographic characteristics. There was a significantly greater proportion of female respondents than male respondents, with 82.2% of the respondents being female. This finding is consistent with the female-to-male ratio of registered nurses in Zimbabwe. A greater proportion of individuals who venture into the nursing profession are female.

Table 2 presents the age of the registered nurses included in this study. The findings show a normal distribution in terms of age, with an average of 33 years; the youngest respondent was 22,

Table 1

Intervals used in the Interpretation of Means

Score	Verbal Interpretation
1-1.79	Very Poor
1.8-2.59	Poor
2.60-3.39	Fair
3.40-4.19	Good
4.2 and above	Excellent

and the oldest respondent was 58. In terms of work experience, the results suggest that many of the respondents currently working at Parirenyatwa Hospital had relatively fewer years of experience, with the mean and median years of experience being approximately seven years.

Nurses from different hospital wards were recruited for the study. The highest number of respondents was from the general surgical wards (n=18), general medical wards (n=16), pediatrics (n=13), and intensive care unit (n=11). There were fewer than ten but more than five respondents from the following wards: oncology (n=7), medico-surgical (n=7), and renal (n=6). There were fewer than five respondents from the following wards: ophthalmology (n=4), obstetrics and gynecology (n=4), neurosurgery (n=3), private (n=3), burns (n=2), cardiology (n=2), neurology (n=2), hematology (n=1), orthopaedics (n=1), and general (n=1).

The second section of the research instrument consisted of five statements crafted to measure the attitudes of registered general nurses towards the provision of oral and maxillofacial care to hospitalized patients. Table 3 presents the results. According to the scoring found in Table 1 (see the statistical treatment of data section), the overall weighted mean for the attitudes possessed by registered general nurses can be interpreted as "good."

Table 2

Sociodemographic characteristics of participating registered nurses

	Mean	**Median**	**Mode**	**Min**	**Max**
Age	33.4	33	30	22	58
Work Experience	7.26	7	3	1	35

Table 3

The attitudes of registered general nurses concerning oral care of hospitalized patients

Item	Mean
Cleaning the oral cavity of patients is a disgusting task*	3.49
Cleaning the oral cavity of hospitalized patients is essential	4.64
Hospitalized patients deserve to have their teeth cleaned	4.56
There are more important tasks than cleaning the oral cavity of patients*	3.26
The oral cavity is one of the most difficult areas of the body to clean*	3.16
Overall Attitudes Score	3.83

N*ote.* * Items were reverse-coded before computing the overall attitude score.

The research instrument included five statements that sought to highlight the practices of registered general nurses regarding the provision of oral and maxillo-facial care to hospitalized patients. Table 4 presents the results. According to the scoring found in Table 1, the overall weighted mean for the practices possessed by the registered general nurses who were respondents in the study can be interpreted as "fair."

Table 4

The practices of registered general nurses concerning oral care of hospitalized patients

Item	Mean
There is sufficient time in our schedule to ensure the patient's oral cavity is cleaned	3.04
The ward provides toothbrushes for hospitalized patients	1.55
The ward readily has dental floss for hospitalized patients	1.64
I have been adequately trained in providing oral care to hospitalized patients	3.96
I feel confident when tasked to clean the oral cavity of patients	3.91
Overall Practices Score	2.83

The next section of the research instrument consisted of five items designed to measure the knowledge of registered general nurses regarding oral and maxillofacial care of admitted patients. Table 5 presents the findings. Of particular note, a great number of respondents (mean=3.25) believed that the best way to clean a patient's teeth is by horizontal movement. This suggests a lack of knowledge about tooth brushing techniques and their application in the care of hospitalized persons. However, most respondents (mean=4.23) demonstrated knowledge concerning the different types of toothbrushes that should be used in different cases. According to the scoring presented in Table 1 (see Statistics section), the overall weighted mean for the knowledge possessed by the registered general nurses who were respondents in the study can be interpreted as "good."

Table 5

Knowledge of registered general nurses regarding oral health care of hospitalized patients

Item	Mean
There is only one correct technique for tooth brushing	2.82
Flossing is recommended three times a day*	2.91
Different patients require different types of toothbrushes	4.23
Pregnant women require extra oral health care	3.73
The best way to clean a patient's teeth is by horizontal movement*	3.25
Overall Knowledge Score	3.37

Upon establishing the knowledge, attitudes, and practices of registered general nurses, this study sought to determine whether there was a correlation between knowledge, attitudes, and practices regarding the oral health care of hospitalized patients. The Pearson's correlation test was performed. Table 6 presents the correlation matrix. There was no significant correlation between knowledge and practices; however, there was a statistically significant weak correlation between attitudes and practices.

Table 6

Correlation Matrix for the Knowledge, Attitudes, and Practices of Registered Nurses regarding Oral Health Care of Hospitalized Patients

Note. * p < .05

		Knowledge	Attitudes	Practices
Knowledge	Pearson's r	-		
	p-value	-		
Attitudes	Pearson's r	-0.012	-	
	p-value	0.910	-	
Practices	Pearson's r	-0.012	0.253*	-
	p-value	-0.012	0.015	-

The findings from the open-ended section of the questionnaire were consistent with those of the closed-ended section. The respondents were asked whether cleaning a patient's oral cavity was important and why. Of the 101 RGNs surveyed, 42 indicated that it prevented unspecified medical complications and 21 specifically mentioned infection prevention, which could lead to complications. The other respondents cited oral conditions resulting from poor oral hygiene, with 30 highlighting halitosis. Nineteen highlighted that it was instrumental in preventing dental caries, eight cited gingivitis, and one mentioned candidiasis. Several responses focused on maintaining the patient's comfort, with six responding that cleaning the oral cavity improves patient comfort, 14 citing that it improves appetite, and 15 mentioning that cleaning the patient's oral cavity is good for general hygiene.

When asked what diseases and complications could result from poor oral healthcare, most of the 101 RGNs surveyed mentioned diseases and conditions that occurred directly within the oral cavity. Fifty-seven cited gingivitis, 55 mentioned bad breath, and 42 reported dental caries. Fewer mentioned maxillofacial and general conditions resulting from poor oral healthcare:13 mentioned dental abscesses; 11 cited ear, nose, and throat infections; 11 mentioned meningitis; 12 mentioned tonsillitis; 7 cited stomatitis; and 5 cited pneumonia and respiratory infections.

When asked if they had received training in oral health management and how, 44 of the 101 RGN respondents said they had received training. Of those who received training, 35 received it as part of their nursing training program

and three received training at work. Fewer respondents provided answers on how the training was conducted, with 7 mentioning that it was by lecture and 10 stating that demonstrations were conducted. However, 52 RGNs said that they had not received training in oral health management. This was mirrored when the question, "what do you think could be done to help you provide oral healthcare to patients?" was posed. The most cited suggestion was the further training of nurses in oral healthcare, with 46 of the 101 respondents suggesting it.

Other suggestions were made by respondents centered on resource constraints, with 25 respondents requesting the provision of oral care packs for the provision of patient oral care in the ward, 22 saying the provision of toothbrushes, floss, and mouthwash for admitted patients would help, and 4 cited that they felt they did not have enough time to provide ideal oral care to patients, suggesting that an increase in nursing staff would allow them more time per patient. A need for collaboration between oral health professionals and registered general nurses was cited, with two respondents suggesting that oral health professionals visiting the ward would help registered general nurses provide better care. In addition, two respondents suggested creating and providing a Standard Operating Procedure manual for the oral care of hospitalized patients.

Discussion

The sociodemographic characteristics of the respondents showed a pattern of relatively young nursing staff as the majority. This pattern translates into the work experience of the staff, which is an average of seven years. The outliers on this attribute were a minimum of one year of experience and a maximum of thirty-five years. With this in mind, the outliers could be the result of a positively skewed representation of the participants' mean age. We hypothesize that this can be explained by the absence of nurses with longer work experience due to the nurses' strike and the presence of recently qualified nurses.

The knowledge level of RGNs regarding the oral and maxillofacial management of hospitalized patients is average. While the least knowledgeable was below average, the most knowledgeable had very high knowledge, but was on the lower spectrum of the category. This finding is consistent with the study by Sharif et al. (2016). They found that the knowledge of Malaysian nursing staff regarding oral healthcare provision was limited. Similarly, the results of this study corroborate those of Grønkjær et al. (2017), who found that nursing students' knowledge of oral health was inadequate, especially regarding periodontal disease and its causative factors. However, this contrasts with a related study that examined the knowledge of medical, pharmacy, and nursing students regarding oral health. Nigerian medical

students possess significantly higher knowledge than nursing and pharmacy students (Bashiru & Omotola, 2016).

The nursing staff at Parirenyatwa Hospital had an average level of knowledge, in contrast to below-average knowledge regarding oral health care. This is because nurses acquire their knowledge formally and informally as they develop the requisite skills regarding the oral and maxillofacial management of hospitalized patients. Although nursing schools do not always adequately address the oral cavity and its care (Estes et al., 2018), practical experience is often gained upon qualification. This is supported by findings from a cross-sectional survey carried out at a tertiary hospital in India, which found that the knowledge and attitudes of nursing staff improved with the years of experience they possessed (Philip et al., 2019).

The overall mean for self-reported attitudes of nursing staff regarding the oral and maxillofacial management of admitted patients was good. Those least knowledgeable considered themselves to have fair attitudes, while those most knowledgeable thought themselves to have excellent attitudes regarding the subject. These findings are consistent with the findings of a study carried out in Malaysia that sought to determine the knowledge and attitudes of medical nursing staff towards the oral health care of pregnant and nursing mothers (Sharif et al., 2016). This is supported by Philip et al. (2019), who found that the attitudes of nurses in Bangalore, India, were positive despite having poor knowledge and practices. This is echoed by the findings of Özveren and Özden (2014), who established that among Turkish nurses, the attitudes concerning oral care of patients were good, with most respondents stating that oral care should be provided in the clinics, was of importance, and that they provided it. Similar studies support the finding of good self-reported attitudes by nursing staff regarding oral care of hospitalized patients (Ibrahim et al., 2015; Miranda et al., 2016).

The practices of the nursing staff regarding oral and maxillofacial management of admitted patients were fair, with the least practicing very poorly and the best being in the good category. These results show a disparity in generally lower practices than self-perceived attitudes and self-reported knowledge. These findings are comparable to findings from other similar studies. In a context analysis of how oral and maxillofacial care was provided to hospitalized patients in a Dutch hospital, it was found that nurses did not prioritize oral care for patients; a lack of requisite skills for the provision of oral care and inability to identify oral health problems were also obtained (Noort et al., 2019). These findings are echoed by Al Rababah et al. (2018), who found that oral care administered to patients by nurses across five hospitals in Saudi Arabia was suboptimal.

The findings of the average overall knowledge, good attitudes, and fair

overall practices regarding oral and maxillofacial care of admitted patients at Parirenyatwa Hospital show a disjointed picture. It is hypothesized that this may be the result of a lack of manpower and resources among registered nurses working at the hospital. Overall, the quantitative findings of this study point towards the existence of room to improve all attributes of RGNs care for admitted patients.

The findings from the open-ended section of the questionnaire were consistent with those from the closed-ended section. Some respondents demonstrated appreciation of how the health of the oral cavity is related to overall health and wellness. They cited oral complications resulting from poor oral hygiene, such as halitosis, gross dental caries, dental abscesses, periodontitis, and candidiasis. This mirrors the overall knowledge of oral and maxillofacial care based on the quantitative data. A few mentioned systemic complications, including meningitis, tonsillitis, stomatitis, pneumonia and ear, nose and throat infections. While knowledge regarding complications resulting from poor oral care is average, there is much left to be desired in terms of knowledge regarding systemic complications related to poor oral care. Registered nurses also acknowledged that good oral hygiene increased the patient's comfort, appetite, and general hygiene. This demonstrates that RGNs have a positive attitude towards oral and general patient oral care and prioritize their patient's comfort.

Respondents highlighted barriers to the provision of oral care, such as resource constraints, lack of collaborative efforts between oral health professionals and registered nurses, and the lack of standard operating procedures for the oral care of hospitalized patients. This could explain the finding of fair practices, which contrasts with the average knowledge and positive attitudes of the registered general nurses.

Conclusion

Based on the findings of this study, the following recommendations are proposed:

1. Further research into the support and resources RGNs currently have, and need to be able to deliver quality oral and maxillofacial care to admitted patients.
2. Continued collaboration between nursing and oral health medical professionals through research, workshops, and information dissemination activities.
3. Coordinate with nursing professional associations and the Nursing Council of Zimbabwe for oral health Continuous Professional Development content during sessions.
4. Include updated oral health management of patients in the curriculum for nurses' training before graduating and produce a manual that can be adopted nationally.
5. The Ministry of Health and Child Care adopt the World Health Orga-

nization's recommended primary health care approach for Oral Health by committing resources and support.

References

Al Rababah, D., Nassani, M., Baker, O., Alhelih, E., Almomani, S., & Rastam, S. (2018). Attitudes and practices of nurses toward oral care of hospitalized patients: A cross-sectional survey in Riyadh, Saudi Arabia. *Journal of Education and Health Promotion*, *7*(149).

Atchison, K., Rozier, R., & Weintraub, J. (2018). Integration of oral health and primary care: Communication, coordination and referral. *NAM Perspectives.* https://saskohc.ca/images/pdf/Integration-of-Oral-Health-and-Primary-CareNAM.pdf.

Azevedo, O., Guedes, É., Araújo, S., Maia, M., & Cruz, D. (2019). Documentação do processo de enfermagem em instituições públicas de saúde. *Revista Da Escola De Enfermagem Da USP*, *53*. https://doi.org/10.1590/s1980-220x2018003703471

Basha, F. Y., Ganapathy, D., & Venugopalan, S. (2018). Oral hygiene status among pregnant women. *Research Journal of Pharmacy and Technology*, *11*(7), 3099. https://doi.org/10.5958/0974-360x.2018.00569.3

Bashiru, B., & Omotola, O. (2016). Oral health knowledge, attitude and behavior of medical, pharmacy and nursing students at the University of Port Harcourt, Nigeria. *Journal of Oral Research and Review*, *8*(2), 66. https://doi.org/10.4103/2249-4987.192209

Calzavara, E. (2017). *Matabeleland: Analysis of the social-historic context and guidelines for recording DMFT* [Master's thesis]. University of Turin, Italy.

Dickson-Swift, V., Kenny, A., Gussy, M., McCarthy, C., & Bracksley-O'Grady, S. (2020). The knowledge and practice of pediatricians in children's oral health: A scoping review. *BMC Oral Health*, *20*(1). https://doi.org/10.1186/s12903-020-01198-0

Dörfer, C., Benz, C., Aida, J., & Campard, G. (2017). The relationship of oral health with general health and NCDS: A brief review. *International Dental Journal*, *67*, 14–18. https://doi.org/10.1111/idj.12360

Dryden, S. V., Shoemaker, W. G., & Kim, J. H. (2013). Wound management and nutrition for optimal wound healing. *Atlas of the Oral and Maxillofacial Surgery Clinics*, *21*(1), 37–47. https://doi.org/10.1016/j.cxom.2012.12.008

Estes, K., Callanan, D., Rai, N., Plunkett, K., Brunson, D., & Tiwari, T. (2018). Evaluation of an interprofessional oral health assessment activity in advanced practice nursing education. *Journal of Dental Education*, *82*(10), 1084-1090. https://doi.org/10.21815/jde.018.103

Fisher, J., Selikowitz, H., Mathur, M., & Varenne, B. (2018). Strengthening oral health for universal health coverage. *The Lancet*, *392*(10151), 899-901. https://doi.org/10.1016/s0140-6736(18)31707-0

Frencken, J., Holmgren, C., & Helderman, W. (2002) *Basic Package of Oral Care* . WHO Collaborating Centre for Oral Health Care Planning and Future Scenarios. http://www.chdentalinstitute.org/images/bpoc.pdf.

Grønkjær, L., Nielsen, N., Nielsen, M., & Smedegaard, C. (2017). Oral health behaviour, knowledge, and attitude

among nursing students. *Journal of Nursing Education and Practice*, *7*(8), 1. https://doi.org/10.5430/jnep.v7n8p1

Harnagea, H., Couturier, Y., Shrivastava, R., Girard, F., Lamothe, L., Bedos, C., & Emami, E. (2017). Barriers and facilitators in the integration of oral health into primary care: A scoping review. *BMJ Open*, *7*(9), e016078. https://doi.org/10.1136/bmjopen-2017-016078

Ibrahim, S., Mudawi, A., & Omer, O. (2015). Nurses' knowledge, attitude and practice of oral care for intensive care unit patients. *Open Journal of Stomatology*, *5*(7), 179-186. https://doi.org/10.4236/ojst.2015.57023

Keboa, M., Beaudin, A., Cyr, J., Decoste, J., Power, F., & Hovey, R. (2019). Dentistry and nursing working together to improve oral health care in a long-term care facility. *Geriatric Nursing*, *40*(2), 197-204. https://doi.org/10.1016/j.gerinurse.2018.10.002

Kerr, J., & Singh, S. (2018). Nursing students' attitudes and practices of oral health self-care. *African Journal for Physical Activity and Health Sciences*, 24 (2), 142-154.

Khadka, S., Khan, S., King, A., Goldberg, L. R., Crocombe, L., & Bettiol, S. (2020). Poor oral hygiene, oral microorganisms and aspiration pneumonia risk in older people in residential aged care: A systematic review. *Age and Ageing*, *50*(1), 81–87. https://doi.org/10.1093/ageing/afaa102

Kundabala, M., Shenoy, R., D'Souza, V., Jain, A., & Suprabha, B. (2022). Preventing early childhood caries through oral health promotion and a basic package for oral care: A pragmatic trial. *Contemporary Clinical Dentistry*, 13(2), 162. https://doi.org/10.4103/ccd.ccd_873_20

Kwak, C., Seo, Y. J., Park, K. H., & Han, W. (2022). Analysis of the knowledge, attitudes, and practice model of healthcare professionals on hearing loss at elderly dementia residences in Korea. *Healthcare*, *10*(5), 792. https://doi.org/10.3390/healthcare10050792

Mapanga, M., & Mapanga, K. (2000). A perspective of nursing in Zimbabwe. *The Online Journal of Issues in Nursing*, *5*(2). https://ojin.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume52000/No2May00/NursingInZimbabwe.html.

Masakure, C. (2012). *On the frontline of caring: A history of African nurses in colonial and postcolonial Zimbabwe, 1940s-1996.* [Doctoral dissertation] University of Minnesota, USA.

Ministry of Health and Childcare. (2022). *Nursing*. Ministry of Health and Childcare. http://www.mohcc.gov.zw/index.php?option=com_content&view=article&id=152&Itemid=473.

Miranda, A., de Paula, R., de Castro Piau, C., Costa, P., & Bezerra, A. (2016). Oral care practices for patients in Intensive Care Units: A pilot survey. *Indian Journal of Critical Care Medicine*, *20*(5), 267-273. https://doi.org/10.4103/0972-5229.182203

Mizutani, K., Mikami, R., Gohda, T., Gotoh, H., Aoyama, N., Matsuura, T., Kido, D., Takeda, K., Izumi, Y., Sasaki, Y., & Iwata, T. (2020). Poor oral hygiene and dental caries predict high mortality rate in hemodialysis: A 3-year cohort study. *Scientific Reports*, *10*(1). https://doi.org/10.1038/s41598-020-78724-1

Msuya, M., Blood-Siegfried, J., Chugulu, J., Kidayi, P., Sumaye, J., & Machange, R. et al. (2017). Descriptive study of nursing scope of practice in rural medically underserved areas of Africa, South of the Sahara. *International Journal of Africa Nursing Sciences*, *6*, 74-82. https://doi.org/10.1016/j.ijans.2017.04.003

Noort, H., Witteman, B., Hertog-Voortman, R., Everaars, B., Vermeulen, H., & Huisman-de Waal, G. (2019). A context analysis on how oral care is delivered in hospitalised patients: A mixed-methods study. *Journal of Clinical Nursing*, *29*(11-12), 1991-2003. https://doi.org/10.1111/jocn.15130

Nursing Council of Zimbabwe. *NCZ History*. Nursing Council of Zimbabwe. http://www.nursescouncil.co.zw/ncz-history/

Olsen, I., & Singhrao, S. K. (2019). Poor oral health and its neurological consequences: Mechanisms of porphyromonas gingivalis involvement in cognitive dysfunction. *Current Oral Health Reports*, *6*(2), 120–129. https://doi.org/10.1007/s40496-019-0212-8

Özveren, H., & Özden, D. (2014). Turkish nurses› attitudes and practices regarding oral care. *International Journal of Nursing Knowledge*, *26*(4), 163-169. https://doi.org/10.1111/2047-3095.12060

Philip, P., Villarosa, A., Gopinath, A., Elizabeth, C., Norman, G., & George, A. (2019). Oral health knowledge, attitude and practices among nurses in a tertiary care hospital in Bangalore, India: A cross-sectional survey. *Contemporary Nurse*, *55*(2-3), 261-274. https://doi.org/10.1080/10376178.2019.1647790

Pimentel, J., 2019. Some biases in likert scaling usage and its correction. *International Journal of Sciences: Basic and Applied Research*, 45(1), 183-191

Politis, C., Schoenaers, J., Jacobs, R., & Agbaje, J. O. (2016). Wound healing problems in the mouth. *Frontiers in Physiology*, *7*. https://doi.org/10.3389/fphys.2016.00507

Reddy, M., Gogoi, A., & Shwetha, H. (2017). Basic Package of Oral Care - A Review. *International Journal of Medical and Oral Research*, *2*(1), 26-31. http://ijmor.org/uploads/2017-i5.pdf.

Satyarup, D., Kumar, M., Dalai, R. P., & Rathor, K. R. (2020). Basic package for oral care: A means to tackle community dental needs. I*ndian Journal of Forensic Medicine & Toxicology*, *14*(4), 8365–8371. https://doi.org/10.37506/ijfmt.v14i4.13000

Sharif, S., Saddki, N., & Yusoff, A. (2016). Knowledge and Attitude of Medical Nurses toward Oral Health and Oral Health Care of Pregnant Women. *The Malaysian Journal of Medical Sciences*, *23*(1), 63-71.

Toney-Butler, T. J., & Thayer, J. M. (2022). *Nursing Process*. StatPearls Publishing.

Wang, J., Chen, L., Yu, M., & He, J. (2020). Impact of knowledge, attitude, and practice (kap)-based rehabilitation education on the KAP of patients with intervertebral disc herniation. *Annals of Palliative Medicine*, *9*(2), 388–393. https://doi.org/10.21037/apm.2020.03.01

World Bank. (2019). *Zimbabwe Data*. https://data.worldbank.org/country/ZW.

World Health Organization. (2016). *Promoting Oral Health in Africa*. https://apps.who.int/iris/bitstream/han-

dle/10665/205886/9789290232971.pdf?sequence=1

World Health Organization. (2020). *Achieving better oral health as part of the universal health coverage and noncommunicable disease agendas towards 2030*. https://apps.who.int/gb/ebwha/pdf_files/EB148/B148_8-en.pdf

Yenen, Z., & Ataçağ, T. (2019). Oral care in pregnancy. *Journal of the Turkish-German Gynecological Association*, *20*(4), 264–268. https://doi.org/10.4274/jtgga.galenos.2018.2018.0139

Zheng, S., Zhao, L., Ju, N., Hua, T., Zhang, S., & Liao, S. (2021). Relationship between oral health-related knowledge, attitudes, practice, self-rated oral health and oral health-related quality of life among Chinese college students: A structural equation modeling approach. *BMC Oral Health*, *21*(1). https://doi.org/10.1186/s12903-021-01419-0