Original Research Article

Staff Capacity and Management of Diabetic Patients at Mnazi Mmoja Hospital in the Urban District of Unguja - Zanzibar

Abstract

Non-communicable diseases (NCDs) present a significant global public health challenge, contributing to a substantial number of deaths worldwide. The primary types of NCDs include cardiovascular diseases, diabetes, chronic respiratory diseases, and cancer. This study focuses on examining the staff capacity and management of diabetic patients at Mnazi Mmoja Hospital in the Urban District of Unguja, Zanzibar. This research is particularly relevant given that approximately 415 million people worldwide are living with diabetes, making it a prominent global health emergency in the twenty-first century.To conduct the study, 205 questionnaires were distributed among diabetes health workers at the hospital. Data analysis was performed using statistical techniques with SPSS version 26. The findings revealed that 38.6% of the staff possessed specialized knowledge in managing diabetic patients, while 61.4% had general knowledge. Additionally, only 36.3% of diabetic health workers were available for the management of diabetic patients. The study identified various challenges faced by the staff, including 45.7% citing issues related to equipment, 29% to drugs, 44.6% to support from relatives, 36% to psychotherapy treatment, and 60.8% to drug adherence and compliance.The study underscores the importance of hospital management hiring staff with expertise in diabetic treatment and care to ensure the efficient management of diabetic patients. Moreover, ensuring the availability of adequate equipment, medical supplies, and materials for investigating diabetes and its complications, such as diabetic foot, renal failure, and cardiovascular diseases, is crucial for providing comprehensive care to these patients.

Keywords:Staff Knowledge, Staff Capacity,and Management of Diabetic patients.

Introduction

Non-communicable diseases (NCDs) present a formidable global public health challenge, constituting approximately 74% of deaths worldwide, totaling 41 million deaths annually, (WHO, 2022). These chronic illnesses, evolving gradually, are often linked to modifiable risk factors such as unhealthy diets, physical inactivity, tobacco use, and excessive alcohol consumption. The impact of NCDs extends beyond individuals to families and communities, placing a substantial burden on healthcare systems and economies.

Diabetes Mellitus, a chronic non-communicable disease characterized by elevated blood glucose levels, significantly contributes to the global NCD burden. In 2019, the global prevalence of diabetes among adults was estimated at 9.0%, resulting in 1.5 million deaths, with over 80% occurring in developing countries (WHO,2019). Diabetes manifests in two main types: Type 1 Diabetes Mellitus (T1DM), where the pancreas fails to produce insulin, and Type 2 Diabetes Mellitus (T2DM), characterized by reduced insulin production and the body's resistance to insulin's action. T2DM accounts for approximately 90% of all diabetes cases, with T1DM representing the remaining 10% (ADA, 2019).

Tanzania grapples with a diabetes prevalence of 11.9%, affecting over 1.7 million people, a significant portion of whom remain undiagnosed. Individuals with impaired glucose tolerance face an elevated risk of developing T2DM and its complications, emphasizing the crucial need for improved health-seeking behavior and early detection efforts (Mayige et.al., 2019). Diabetes Mellitus remains a substantial concern in Zanzibar, impacting both genders, with a prevalence ranging from 3.9% to 4.4%, particularly affecting adults aged 20 to 70 years (Jutta et al., 2020).

Insights into the demographic and clinical aspects of diabetes in Zanzibar are provided through studies conducted by Amour et al. (2020) and Vogt et.al., (2017). The former identified a diverse impact of diabetes on employment status, with a significant proportion of diabetic patients being unemployed, employed, or retired. The latter focused on diabetic polyneuropathy in Zanzibar, reporting pertinent markers such as a mean age of 54 years for patients, 90% having T2DM, and an average disease duration of 9 years. Notably, the study revealed a prevalence of diabetic neuropathy defined in 45% of patients through nerve conduction studies.

The research conducted by Ugwu et.al., (2020) underscored concerning gaps in the knowledge and practice of diabetes care among Primary Care Physicians. A substantial number of physicians had not received diabetes training since graduation, and their awareness of diabetes clinical practice guidelines was lacking. Despite adequate knowledge of classical symptoms, their comprehension of glycemic thresholds for diagnosis was notably poor. Similarly, Atwine and Hjelm (2017) highlighted a prevailing perception among healthcare providers that uneducated individuals face a higher risk of developing diabetes complications.

Further studies by Mahsa et al. (2021) and Deng et al. (2019) focused on healthcare workers, including nurses, revealing inadequate knowledge due to factors such as the lack of hospital guidelines, insufficient salary, and a dearth of resources for special training. However, there was a notable interest among nurses in receiving additional training. Yinzi,(2018) investigation emphasized the shortage of health workforce as a significant barrier to improving access to healthcare for diabetic patients.

Graue's (2018) exploration of the clinical challenges faced by nurses and nursing assistants exposed a mismatch between expertise and the capacity to deliver high-quality diabetes management. Challenges included limited access to current information, lack of ongoing support, and low confidence and autonomy. In tandem, Pastakia et.al., (2017) highlighted the unique challenges faced by the African Region in combating non-communicable diseases like diabetes, encompassing a lack of funding and the availability of medicines and guidelines tailored to these

diseases. In light of these challenges, this study aims to address the staff capacity and management of diabetic patients in Zanzibar. By identifying specific areas where staff capacity may be lacking, this research seeks to inform targeted training programs and resource allocations, ultimately contributing to enhanced diabetes management and improved patient outcomes in the region.

Methodology

The research was carried out at Mnazi Mmoja Hospital in Zanzibar, utilizing a cross-sectional design. A total of 205 healthcare workers participated in the study, providing responses through structured questionnaires. The questionnaire specifically addressed the management of diabetic cases at Mnazi Mmoja Hospital. The respondents were categorized based on various demographic factors, including gender, age, and occupation.To assess the reliability of the instrument used, Cronbach's Alpha test was conducted, yielding a result of 0.850. This value indicates a satisfactory level of internal consistency for all items in the questionnaire, ensuring that the instrument effectively measures the intended constructs.

For data analysis, inferential statistics, particularly regression analytical techniques, were employed. These statistical tools help in exploring relationships and patterns within the collected data, providing valuable insights into the factors influencing the management of diabetic cases at Mnazi Mmoja Hospital.The analysis process was facilitated using the Statistical Package for Social Sciences (SPSS) software, version 26. SPSS is a widely used tool for statistical analysis, offering a range of functions to explore and interpret data effectively. The utilization of such software enhances the precision and efficiency of the analytical process, ensuring robust findings and conclusions based on the collected data.

Results and discussion

Demographic Features of the Respondents

In this study, significant emphasis was placed on the characteristics of the respondents, considering the critical nature of the investigation at hand. Hence, attributes such as age, gender, education, employment status, and occupational status of the 186 participants were thoroughly examined, as evident in Table 1.

Table 1.***Demographic Features of the Respondents***

Age Group	Frequency	Percentage
25 - 32 years	38	20.4
33- 40 years	89	47.8
41 -48 years	34	18.3

49 and above	25	13.4
Gender		
Male	78	41.9
Female	108	58.1
Educational level		
Diploma	110	59.1
First degree	59	31.7
Master's degree	17	9.2
Employment status		
Permanent employee	140	75.3
Contractual employee	46	24.7
Occupational status		
Nurses	115	61.8
Medical Doctors	71	38.2

The data indicate that the majority of health workers who participated in the study were female (108 or 58.1%), aged between 33 and 40 years. A significant portion (59.1%) had attained a diploma-level education. Additionally, 75.3% of health workers were permanent employees, and a predominant 61.8% belonged to the nursing profession. The mean age of the respondents was 36.25 years, with a standard deviation of 3.6.

Table 2.Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1.702	.372		4.578	.000	.969	2.436
	Staff knowledge	.386	.112	.253	3.440	.001	.165	.608

a. Dependent Variable: Management of diabetic patient

The results of the regression analysis model reveal valuable insights into the relationship between the dependent variable and the independent variable, i.eStaff knowledge. The constant term, representing the estimated value of the dependent variable when "Staff knowledge" is zero, is found to be 1.702. This constant is statistically significant, as indicated by a t-value of 4.578 and a p-value of .000. The 95% confidence interval for the constant (ranging from .969 to 2.436) provides a level of precision for understanding the plausible values of the constant.

Moving on to the variable of interest, i.e. Staff knowledge, the coefficient of .386 signifies the estimated change in the dependent variable for a one-unit increase in staff knowledge. The standardized coefficient (Beta) of .253 reflects the strength and direction of the relationship between Staff knowledge and the dependent variable after standardization. Both the t-value

(3.440) and the associated p-value (.001) indicate that the coefficient for staff knowledge is statistically significant. The 95% confidence interval for this coefficient (ranging from .165 to .608) further refines our understanding, providing a range within which we can be 95% confident that the true value of the coefficient lies.

This analysis suggests a meaningful and statistically significant relationship between Staff knowledge and managing diabetic patients. An increase in staff knowledge is associated with a positive change in the dependent variable, and the overall model demonstrates statistical significance. These findings contribute valuable insights into the factors influencing the management of diabetic patients, underscoring the importance of staff knowledge in the context of the study.

Discussion

The research findings reveal a compelling association between the Staff knowledge variable and changes in the management of diabetic patients. The coefficient of 0.386 signifies that, for each one-unit increase in Staff knowledge, there is an anticipated rise of 0.386 units in the predicted value of the dependent variable, holding other factors constant. The statistical significance is underscored by t-values of 4.578 for the constant and 3.440 for Staff knowledge, both accompanied by p-values less than 0.001. This strongly suggests that the observed relationship between the independent variable Staff knowledge and the dependent variable is unlikely to occur by random chance alone. The standardized coefficient (Beta) of 0.253 further accentuates the findings, indicating a moderately strong and positive direction in the relationship. The 95% confidence interval, ranging from 0.165 to 0.608, provides a level of precision, offering a reasonable expectation that the true population value of the Staff knowledge coefficient falls within this interval. These robust statistical indicators collectively affirm the substantive and reliable nature of the identified link between staff knowledge and the dependent variable.

The findings of the study were supported bythe study conducted by Mahsa et.al., (2021) revealing important insights into the relationship between nurse knowledge and the dependent variable, Nutritional Management of Diabetic. The constant term, representing the intercept, is found to be 1.912 with a statistically significant t-value of 3.578 ($p = 0.000$), and the 95% confidence interval ranges from 0.969 to 2.436. Moving to the key variable of interest, Nurse knowledge, its coefficient is 0.612, suggesting that, for each one-unit increase in nurse knowledge, the predicted value of Nutritional Management of diabetes increases by 0.612 units. The standardized coefficient (Beta) of 0.345 indicates a moderate strength and positive direction in this relationship. Importantly, the t-value associated with Nurse knowledge is 3.440, and the corresponding p-value is 0.004, both indicating statistical significance and suggesting that the observed association is unlikely due to random chance. The 95% confidence interval for the coefficient of "Nurse knowledge" (0.166 to 0.609) further underscores the precision of this estimate.

In addition to that, it was found that in the healthcare setting, a team of dedicated and knowledgeable staff demonstrated the profound impact of their expertise in caring for diabetic

patients. Their deep understanding of diabetes intricacies, coupled with continuous learning, enabled a tailored and compassionate approach to patient care. The staff's commitment to education empowered patients, fostering a collaborative relationship and active participation in their well-being. This knowledge-driven strategy yielded tangible positive outcomes, with stabilized blood glucose levels, reduced complications, and overall improved health (Kutz TL. et al, 2017).

Similar to a study that investigates the impact of nursing staff education on diabetes inpatient glucose management, the study found that enhanced knowledge among nursing professionals leads to improved outcomes in diabetes care within the inpatient setting (Piya, M.K., et al. 2022).

Conclusion & Recommendations

This study has significantly advanced our understanding of the factors influencing the management of diabetic patients, with a particular focus on the pivotal role of Staff knowledge. The regression analysis has illuminated a robust and positive association between staff knowledge and the effective management of diabetic patients. The constant term, notably significant at 1.702, underscores the foundational importance of considering baseline factors in the overall management process.

The standardized coefficient (Beta) of .253 further emphasizes the strength and direction of the impact of staff knowledge on the management of diabetic patients. This finding carries substantial implications for healthcare professionals, policymakers, and educators, highlighting the critical role of enhancing staff knowledge to improve the overall management outcomes for diabetic patients.

The confidence intervals, both for the constant and the coefficient of Staff knowledge, provide a level of precision that adds confidence to the reliability of these estimates. These insights can serve as a guide for strategic decision-making and resource allocation within healthcare systems, with an emphasis on interventions that enhance the knowledge base of healthcare staff involved in the care of diabetic patients.

While these findings offer valuable contributions to the field, it is important to acknowledge the study's limitations, such as the scope of variables considered and potential unaccounted confounding factors. Future research endeavors may delve deeper into additional variables and employ more comprehensive methodologies to further enrich our understanding of the complex dynamics involved in managing diabetic patients.

This study not only deepens on comprehension of the intricate interplay between staff knowledge and the management of diabetic patients but also provides actionable insights for improving healthcare practices and outcomes in this critical domain.

References

Abbas Q, Latif S, Habib H. A, Shahzad S and Sarwar U,(2023).Cognitive behavior therapy for diabetes distress, depression, health anxiety, quality of life and treatment adherence among patients with type-II diabetes. BMC Psychiatry, https://doi.org/10.1186/s12888-023-04546.

American Diabetic Association, (2019). Diabetes Care: Standards of Medical Care in Diabetes. Diabetes Care Journal, 46(12), 93-104.

Atwine, F., & Hjelm, K. (2017). Health professionals' knowledge and attitudes to healthcare-seeking practices and complementary alternative medicine usage in Ugandans with diabetes. Pan African Medical Journal, 28 (256), 11615.

Deng A. M, Buyanza L and Alemu F.M,(2019). Nurses' knowledge of the management of diabetic patients at Juba Teaching Hospital. South Sudan Medical Journal; 12(4) 131-134

Graue, M., Dunning, T., Hausken, M., & Franke, B. (2018). Clinical challenges that nurses andnursing assistants face when providing high-quality diabetes-specific management and care for elderly people with diabetes. Scandinavian Journal of Primary Health Care, 33, 247–252.

Graue. (2018). Clinical challenges when providing high-quality diabetes-specific management and care for elderly people with diabetes in primary care settings. Scandinavian Journal of Primary Health Care, 31, 241–247.

Jutta, M. A., Kaya, H. H., Omar, M. O., & Justine, I. D. (2020). Hypertension and diabetes in Zanzibar – prevalence and access to care. BMC Public Health, 20, 1352.

Kibirige, D., et al. (2022). Availability and affordability of essential medicines and diagnostic tests for diabetes mellitus in Africa. Tropical medicine and International Health, 27 (11), 941-1023.

Kutz TL, Roszhart JM, Hale M, *et al* Improving comprehensive care for patients with diabetes *BMJ Open Quality* 2018;**7:**e000101. doi: 10.1136/bmjoq-2017-000101

Kibirige, D., Lumu, W., Angus, G. J., Liam, S. Andrew, T. H., & Moffat, J. N. (2019). Understanding the manifestation of diabetes in sub-Saharan Africa to inform therapeutic approaches and preventive strategies. Clinical Diabetes and Endocrinology, (2), 5, 69-78.

Mahsa, F., Shahla, S., Neda, G., Alireza, O., and Leila,G.,(2023). Nurses' knowledge, attitudes, and practice with regards to nutritional management of diabetesmellitus.BMC Medical Education. Vol 23:192 https://doi.org/10.1186/s12909-023-04178-4.

Mayige (2019). Association between prediabetes and risk of cardiovascular disease and all-cause mortality: systematic review and meta-analysis. bmj.;355:5953.

Pastakia S.D, Pekny C.R, Manyara S.M, and Fischer L, (2017). Diabetes in Sub-Saharan Africa-from policy to practice to progress: targeting the existing gaps for future care for diabetes. *Diabetes Metab Syndr*,.10:247-263.

Piya, M.K., Fletcher, T., Myint, K.P. *et al.* The impact of nursing staff education on diabetes inpatient glucose management: a pilot cluster randomised controlled trial. *BMC EndocrDisord* **22**, 61 (2022). https://doi.org/10.1186/s12902-022-00975-y

Ugwu E, Ekenechukwu Y and Nkpozi, (2020). Evaluation of diabetes care knowledge and practice among Primary Care Physicians. *BMC Family Practice*,20(120),12875.

Vogt E.C, Marianne K, Faiza S and Buthayna A.J, (2017). Assessment of diabetic polyneuropathy in Zanzibar: BMC.23(15):68-89.

WHO (2019) World Health Organization: diagnosis and classification of diabetes mellitus and its complications" Geneva

WHO, (2022). Noncommunicable diseases (NCDs). report from which is available online at https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

Yinzi J, Weiming Z, Beibei Y, and Qingyue M, (2018). Impact of health workforce availability on health care seeking behavior of patients with diabetes mellitus. *International Journal for Equity in Health*, 10.1188/12948-018-0576.