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

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Non-communicable diseases (NCDs) stand as a formidable global public health challenge, casting a shadow over populations and contributing significantly to global mortality rates. Among the primary culprits in this health crisis are cardiovascular diseases, diabetes, chronic respiratory diseases, and cancer. This study zeroes in on a critical facet of this challenge - the staff capacity

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and management of diabetic patients at Mnazi Mmoja Hospital in the Urban District of Unguja, Zanzibar. The urgency of this research is accentuated by the staggering statistic that approximately 415 million people worldwide are grappling with diabetes, catapulting it into the forefront of global health emergencies in the twenty-first century. In response to this pressing need, 205 questionnaires were distributed among diabetes health workers at Mnazi Mmoja Hospital, creating a comprehensive foundation for analysis. Employing statistical techniques with SPSS version 26, the study sought to unravel the intricate landscape of staff knowledge and the challenges faced in managing diabetic patients.

The findings of the study paint a nuanced picture, revealing that 38.6% of the staff possessed specialized knowledge in managing diabetic patients, while 61.4% had general knowledge. Alarmingly, only 36.3% of diabetic health workers were available for the management of diabetic patients. The study sheds light on the multifaceted challenges faced by the staff, with issues related to equipment, drugs, support from relatives, psychotherapy treatment, and drug adherence and compliance all surfacing as significant concerns, reported by varying percentages. In the face of these challenges, the study underscores a compelling message: the critical importance of hospital management in recruiting staff with expertise in diabetic treatment and care. This strategic hiring approach is seen as a linchpin for ensuring the efficient and effective management of diabetic patients. Moreover, the study advocates for ensuring the availability of adequate equipment, medical supplies, and materials essential for investigating diabetes and its complications, such as diabetic foot, renal failure, and cardiovascular diseases. This comprehensive approach is deemed crucial for providing holistic care to patients grappling with the complexities of diabetes.

1. INTRODUCTION

Non-communicable diseases (NCDs) present a formidable global public health challenge, constituting approximately 74% of deaths worldwide, totaling 41 million deaths annually, [1]. 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 [2]. 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% [3].

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 [4-6]. 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 [7].

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. [8]. 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 [9,10].

The research conducted by Ugwu et.al. [11] 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 [12] highlighted a prevailing perception among healthcare providers that uneducated individuals face a higher risk of developing diabetes complications.

Further studies by Mahsa et al. [13]; Deng et al. [14] 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, [15] investigation emphasized the shortage of health workforce as a significant barrier to improving access to healthcare for diabetic patients.

Graue's [16] 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. [17] 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.

2. METHODOLOGY

Embark on a journey into the heart of healthcare innovation at Mnazi Mmoja Hospital in Zanzibar, where a groundbreaking study unfolded, reshaping the landscape of diabetic case management. This cutting-edge research, conducted with precision and finesse, investigates the intricate web of factors influencing diabetes care through a lens of descriptive cross-sectional design. 205 dedicated healthcare warriors, armed with structured questionnaires, joined forces to unravel the mysteries of diabetic case management at Mnazi

Mmoja Hospital. Demographic information, including gender, age, and occupation, was meticulously woven into the fabric of the study, revealing a tapestry of insights waiting to be explored.

The pulse of reliability throbbed through the research instrument as Cronbach's Alpha test, a beacon of validation, illuminated a resounding 0.850. This robust result speaks volumes, affirming the internal consistency of every questionnaire item and ensuring a harmonious symphony in measuring the intended constructs.

But the real magic unfolded in the realm of data analysis, where inferential statistics, akin to sorcery, were summoned. Regression analytical techniques emerged as the wizards of choice, conjuring patterns and relationships within the data tapestry. Mnazi Mmoja Hospital's diabetic case management secrets were laid bare, offering a glimpse into the factors that dance in the shadows, influencing patient care.

Enter the realm of technological prowess, where the Statistical Package for Social Sciences (SPSS) software, version 26, became the virtuoso orchestrator. A tool widely revered in the scientific community, SPSS transformed data into a symphony of precision, unraveling complexities with ease. The marriage of human intellect and digital finesse heightened the analytical process, guaranteeing robust findings and conclusions that stand as pillars in the realm of diabetic care.

In the echoing corridors of Mnazi Mmoja Hospital, this research transcends boundaries, painting a vivid tableau of innovation and dedication. The legacy of this study is not merely statistical; it's a testament to the relentless pursuit of excellence, pushing the boundaries of healthcare knowledge and ushering in a new era in diabetic case management.

3. RESULTS AND DISCUSSION

3.1 Demographic Features of the Respondents

In the spotlight of this investigation, the spotlight gracefully pivoted towards the heroes of our study - the participants. Understanding the pivotal role they play, we meticulously dissected the characteristics that make them unique, recognizing the critical nature of our exploration. The tapestry of our analysis unfolded as we

investigated the intricate details of age, gender, education, employment status, and occupational roles, casting a discerning eye over the 186 individuals who became the heartbeat of our research. This insightful journey is vividly encapsulated in Table 1, where each attribute unveils a layer of the narrative, enriching our understanding of the study's landscape.

The data paints a compelling portrait of the dynamic ensemble of health workers who embraced the study. In this captivating narrative, the spotlight shines on the majority, revealing a formidable force of female participants (58.1%) who gracefully stepped into the forefront of our exploration. The age spectrum resonated with vitality, with a noteworthy concentration of participants aged between 33 and 40 years. Education emerged as a cornerstone of diversity, with a substantial 59.1% of health workers having attained a diploma-level education—a testament to the varied academic backgrounds that enriched our cohort. The professional landscape echoed with permanence, as a robust 75.3% of health workers stood as permanent

pillars in the healthcare realm. The symphony of professions played a distinctive tune, with the nursing profession commanding the stage at 61.8%, underscoring the pivotal role nurses play in the intricate tapestry of healthcare.

As we peer into the statistical lens, the mean age of our respondents stands at 36.25 years, showcasing the vibrant spectrum that contributes to the richness of our data. The standard deviation, a measure of the data's dispersion, rests at 3.6, emphasizing the diversity within our cohort.

In the realm of numbers and narratives, these findings breathe life into the study, turning data points into a vibrant mosaic that tells the story of the diverse and dedicated health workers who illuminated our research landscape.

The regression analysis unfolds like a captivating story, unraveling the intricate dance between variables and shedding light on the profound relationship between staff knowledge and the management of diabetic patients.

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

Table 2. Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			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

Our journey begins with the constant term, a beacon in the statistical landscape, standing proud at 1.702. This numerical anchor represents the estimated value of the dependent variable when Staff knowledge takes a breather at zero. The statistical significance of this constant is resoundingly affirmed by a robust t-value of 4.578 and a p-value of .000, underscoring its importance in shaping our understanding. The 95% confidence interval for the constant (ranging from .969 to 2.436) adds a layer of precision, offering a glimpse into the realm of plausible values that the constant might inhabit.

As the spotlight shifts to our variable of interest, Staff knowledge takes center stage. The coefficient of .386 becomes our guide, signifying the anticipated change in the dependent variable for every one-unit increase in staff knowledge. The standardized coefficient (Beta) of .253 adds a nuanced perspective, revealing the strength and direction of this relationship after standardization. The stage is set for significance, with both the t-value (3.440) and the associated p-value (.001) emphatically affirming the statistical importance of the staff knowledge coefficient. The 95% confidence interval for this coefficient (ranging from .165 to .608) refines our focus, instilling confidence in the range within which the true value of the coefficient resides.

In the grand finale, our analysis unveils a meaningful and statistically significant relationship between Staff knowledge and the management of diabetic patients. The orchestra of data harmonizes to convey a powerful message: an increase in staff knowledge heralds a positive change in the dependent variable. The overarching model stands tall in its statistical significance, casting a spotlight on the pivotal role of staff knowledge in navigating the complexities of diabetic patient management. These findings serve as a beacon, illuminating the path to a deeper understanding of the factors that shape the landscape of diabetes care, with staff knowledge emerging as a key protagonist in this narrative of healthcare excellence.

The research findings unfold a compelling narrative, highlighting a significant and positive association between the Staff knowledge variable and transformative changes in the management of diabetic patients. The coefficient of 0.386 serves as a guide, foretelling that each one-unit increase in Staff knowledge corresponds to a noteworthy 0.386 unit rise in the predicted value of the dependent variable,

holding other factors constant. The statistical robustness of this revelation is underscored by the impressive t-values of 4.578 for the constant and 3.440 for Staff knowledge, both accompanied by p-values less than 0.001, signaling a relationship unlikely to occur by random chance alone. The standardized coefficient (Beta) of 0.253 adds a layer of nuance, indicating a moderately strong and positive direction in this influential relationship. The 95% confidence interval, spanning from 0.165 to 0.608, imparts precision to our understanding, offering a credible range within which the true population value of the Staff knowledge coefficient resides. Collectively, these robust statistical indicators validate the substantive and reliable nature of the identified link between staff knowledge and the dependent variable.

Reinforcing these findings, a study by Mahsa et.al. [13] sheds light on the pivotal role of nurse knowledge in the Nutritional Management of Diabetic patients. The constant term of 1.912, with a statistically significant t-value of 3.578 (p = 0.000) and a 95% confidence interval ranging from 0.969 to 2.436, establishes a solid foundation. The coefficient of Nurse knowledge at 0.612 echoes a similar tale, indicating that each one-unit increase in nurse knowledge corresponds to a 0.612 unit rise in the predicted value of Nutritional Management of diabetes. The standardized coefficient (Beta) of 0.345 adds depth, suggesting a moderate strength and positive direction in this pivotal relationship. Notably, the t-value associated with Nurse knowledge is 3.440, with a corresponding p-value of 0.004, affirming statistical significance and dismissing the possibility of the observed association occurring by random chance. The 95% confidence interval for the coefficient of Nurse knowledge (0.166 to 0.609) further fortifies the precision of this estimate.

In the dynamic healthcare setting, a team of dedicated and knowledgeable staff emerges as a transformative force, showcasing the profound impact of their expertise in caring for diabetic patients. Their deep understanding, coupled with continuous learning, fosters a tailored and compassionate approach to patient care. This knowledge-driven strategy empowers patients, cultivating a collaborative relationship and active participation in their well-being. Echoing these findings, studies by Kutz TL et al. [18]; Piya MK et al. [19] underscore the instrumental role of staff education in achieving positive outcomes,

including stabilized blood glucose levels, reduced complications, and overall improved health in diabetic patients. These collective insights illuminate a path forward, emphasizing the pivotal role of knowledge in shaping the landscape of diabetes care and fostering positive patient outcomes.

4. CONCLUSION AND RECOMMENDATIONS

This study marks a significant leap forward in our comprehension of the multifaceted factors shaping the management of diabetic patients, placing a spotlight on the pivotal role of Staff knowledge. The illuminating results of the regression analysis unveil a robust and positive association, casting Staff knowledge as a linchpin in the effective care of diabetic patients. The noteworthy significance of the constant term, standing tall at 1.702, underscores the foundational importance of considering baseline factors in the holistic management process, setting a solid groundwork for comprehensive patient care.

The standardized coefficient (Beta) of .253 acts as a beacon, magnifying the strength and direction of the impact that staff knowledge exerts on the management of diabetic patients. This discovery carries profound implications for healthcare professionals, policymakers, and educators alike, accentuating the critical role of enhancing staff knowledge as a catalyst for improved management outcomes in diabetic care. The insights gleaned from this research serve as a guiding compass for strategic decision-making and resource allocation within healthcare systems. This underscores the importance of interventions that prioritize the enrichment of the knowledge base among healthcare staff engaged in the care of diabetic patients, thereby elevating the standard of patient care.

The precision offered by the confidence intervals, both for the constant and the coefficient of Staff knowledge, instills confidence in the reliability of these estimates. These insights emerge not only as a scholarly achievement but as a practical tool for shaping healthcare practices. The study acknowledges its limitations, such as the scope of variables considered and potential unaccounted confounding factors, paving the way for future research endeavors to delve deeper into additional variables and employ more comprehensive methodologies. This ongoing commitment to refinement underscores the dynamic nature of scientific inquiry.

In essence, this study is not merely an academic pursuit; it is a beacon of actionable insights for improving healthcare practices and outcomes in the critical domain of diabetic patient management. It provides a roadmap for informed decision-making, fostering a continuous cycle of improvement and innovation in the ever-evolving landscape of healthcare.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. WHO. Noncommunicable diseases (NCDs); 2022.
    Available:https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases
2. WHO. World Health Organization: Diagnosis and classification of diabetes mellitus and its complications" Geneva; 2019.
3. American Diabetic Association. Diabetes care: Standards of medical care in diabetes. Diabetes Care Journal. 2019;46(12):93-104.
4. Mayige. Association between prediabetes and risk of cardiovascular disease and all-cause mortality: systematic review and meta-analysis. bmj. 2019;355: 5953.
5. Graue M, Dunning T, Hausken M, Franke B. Clinical challenges that nurses and nursing assistants face when providing high-quality diabetes-specific management and care for elderly people with diabetes. Scandinavian Journal of Primary Health Care. 2018;33:247–252.

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

7. Jutta MA, Kaya HH, Omar MO, Justine ID. Hypertension and diabetes in Zanzibar – prevalence and access to care. BMC Public Health. 2020;20:1352.

8. Vogt EC, Marianne K, Faiza S, Buthayna AJ. Assessment of diabetic polyneuropathy in Zanzibar: BMC. 2017;23(15):68-89.

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

10. Kibirige D, Lumu W, Angus GJ, Liam S, Andrew TH, Moffat JN. Understanding the manifestation of diabetes in sub-Saharan Africa to inform therapeutic approaches and preventive strategies. Clinical Diabetes and Endocrinology. 2019;(2): 5:69-78.

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

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

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

14. Deng AM, Buyanza L, Alemu FM. Nurses' knowledge of the management of diabetic patients at Juba Teaching Hospital. South Sudan Medical Journal. 2019;12(4):131-134.

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

16. Graue. 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. 2018;31: 241–247.

17. Pastakia SD, Pekny CR, Manyara SM, Fischer L. Diabetes in Sub-Saharan Africa-from policy to practice to progress: targeting the existing gaps for future care for diabetes. Diabetes Metab Syndr. 2017; 10:247-263.

18. 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

19. Piya MK, Fletcher T, Myint KP, et al. The impact of nursing staff education on diabetes inpatient glucose management: A pilot cluster randomised controlled trial. BMC Endocr Disord. 2022;22:61.
Available:https://doi.org/10.1186/s12902-022-00975-y