Predictors of Non-Adherence to Type II Diabetes Management Among Adult Inmates in Machakos County Prisons, Kenya

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Abstract

Background: While the management of Type II diabetes continues to enjoy progressive changes, non-compliance with medications has emerged as a threat that could jeopardize public health gains. The incarcerated population best captures the 21st-century concern, where the special group is faced with limited decision-making capabilities. The aim of this study was to establish the predictors that influence non-compliance to type II diabetes treatment among adult inmates in Machakos County Prisons.

Methods: A mixed methods was used to conduct interviews from 258 staff and 556 inmates. The study area encompassed inmates and staff of Yatta and Machakos GK prison in Machakos County. Data were collected through the use of structured questionnaires and KII. Data was analyzed using SPSS version 20 software, Chi square and logistical regression. Results were presented using tables, charts and bar graphs.

Results: The findings shows that involvement in treatment decisions has a significant influence on non-adherence to type II diabetes management (p=0.000). The respondents who are not involved in treatment decisions (OR= 0.154, 95%CI [0.061-0.385], p = 0.000) were more likely to be non-adherent to type II diabetes management as compared to those who are involved in treatment decisions. The findings indicates that doctors giving prisoners information on diabetes has a significant influence on non-adherence to type II diabetes management (p=0.000). The prisoners who don't receive information on diabetes (OR= 6.577, 95%CI [3.043-14.213], p = 0.000) were more likely to be non-adherent to type II diabetes management as compared to prisoners who receive information on diabetes.

Conclusion: The study found that adult inmates were not involved in treatment decisions. This study therefore recommends that the doctors in prison clinics should spend adequate time with the inmates explaining important information on diabetes to help the patient understand his condition and encourage him to start and maintain therapy. Patient satisfaction and a good understanding of the content given by the provider improve compliance to type II diabetes management among adult inmates.

Keywords: Predictors, Patient-Provider relationship, Non- compliance

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1. Introduction

Non-compliance has remained the main barrier to optimal health outcomes despite the advocated benefits of compliance to type II diabetes management both to individual patients and the healthcare system as a whole. Non-compliance is a costly and common problem that cuts across all regions. In defining the scope of the problem, the National Centre for Biotechnology Information, (2018) found that between 25%- 50% of patients worldwide did not comply with medication as recommended. Lack of compliance has cost individual patients their good health, increased mortality, and the healthcare system millions of shillings, due emergence of type II diabetic-related complications and re-hospitalization. Non-compliance to type II diabetes has led to heightened risks of complications, a development that culminates in decreased quality and length of life. These complications account for negative health, social and psychological implications as observed by Anon (2018). However, many epidemiological studies have given varying factors associated with non-compliance with type II diabetes management which are unique with each subpopulation.

Despite the existence of several pharmacological and non-pharmacological interventions that can control symptoms and thwart complications of type II diabetes, non-compliance to these management therapies remain one of the most burdensome public health concerns, (Hernández-Ronquillo *et al.,* 2003). It has been highlighted as one of the underlying factors in the growing morbidity, mortality, and health care costs associated with the metabolism disorder. Patient compliance with management has been proved to have a strong correlation between compliance, patient outcome, and treatment cost as reported by Breitscheidel *et al.* (2010). Building on this WHO, (2017) observed that with the high magnitude of non-compliance and the resultant consequences related to it, it was of great importance to improve medication compliance on the existing treatments rather than developing new drug therapy to control complications associated with type II diabetes.

Although a vast collection of predisposing aspects has been acknowledged, the prediction of non-compliance remains poor. The magnitude and the impact of medication non-compliance in the developing countries are assumed to be higher than 50%

given the limited availability of data, inequities in access to health care, and limited medical resources, (WHO, 2017). The predictors identified do not give clear associations to explain the non-compliance to medication. To overcome this, many researchers recommended the need to have data provided for each subpopulation to explain the magnitude and predictors of non-compliance to facilitate the development of models and policies to improve compliance to type II diabetes management. Medication compliance has been observed to be affected by multiple and diverse factors, (Adu *et al.,* 2019). A clear understanding of what affects and how it affects each population and addressing these predictors will greatly improve compliance to type II diabetes management especially the inmates, for policies will be tailored according to their needs.

Inmates are the most affected group by non-compliance with reports confirming that there are disproportionately affected by the public health issue. High prevalence levels of type II diabetes are recorded in Ghana prisons this being attributed to high risk of smoking, reduced physical activity, and the inmates have little choices on the food they eat in the prisons, (Ritter *et al* 2011). In Kenya, no data is available due to the failure of researchers overlooking the health needs of this subpopulation and the complexity of the prison institution though the situation might be likely the same. The situation is projected to increase as the population serving long sentences are aging and new inmates who are at risk of developing the condition are joining the facilities, (ADA, 2013a). Prison facilities overlook the provision of adequate health care to inmates due to the complexity of the institutional policies. For instance, compulsory rest during confinement renders the inmate physically inactive contradicting the management of type II diabetes, which emphasizes the need to undertake regular physical exercise. Poor and a common diet offered to the prisoners consequently leads to non-compliance to the management, (Pauley *et al.,* 2019). The prison settings can offer large obstacles to compliance with medication due to varying reasons as WHO (2015), recommended that there is a need the prison management to consider incorporating outsiders to offer support in the health care delivery system in the prison. The inflexibility of the institutional rules can contribute to patients missing taking drugs or even visiting a doctor for a follow-up clinic.

Prisoners are thus faced with a twin epidemiological challenge of a high risk of type II diabetes as well as poor compliance with its management to both pharmacological and non-pharmacological therapies. Despite the right to health being a pillar in the Kenya constitution, (2010), medical care to inmates is challenging. Inefficiency, lack of resources in terms of drugs and medical staff, and lack of specialized equipment are some of the shortcomings IMLU, (2004) cited as main challenges to effective medical care in Kenyan prisons. In cases where the inmates have to seek medical attention in public hospitals, the prisons lack ambulances hence the patients are transported in prison lorries which at times may worsen the situations. Prison health facilities are faced with a challenge of a clear and proper referral system of the patients due to the logistical challenges including the need for an extra security guard in the hospitals when the patients are hospitalized. Inmates don't have a preference of choice where to get medical attention in case of type II diabetes complications emerge, leading to delayed detection and treatment of the same, (Paulery *et al.,* 2019). The dilemma informs this study, where I will be investigating predictors of non-compliance to type II diabetes management. The inquiry is founded on the need to promote the robustness of the current body of knowledge.

2. Materials and methods

2.1 Study site

This study used a facility-based descriptive cross-sectional design to investigate the patient-centered and institutional-level factors that influence type II diabetes management in Machakos County prisons. The cross-sectional approach is time-saving and convenient in collecting a vast amount of data from a significant number of respondents. The design is ideal because the data to be collected relates to a single specified time and also includes some historical information.

2.2 Target population

The target population comprised of all inmates with type II diabetes as well as the staff. The inmates were generally from the county and some from the neighboring Kiambu and Makueni counties since they both had a medical clinic to serve the staff and inmates.

2.3 Study design

This study used a facility-based descriptive cross-sectional design to investigate the patient-centered and institutional-level factors that influence type II diabetes management in Machakos County prisons. The design is ideal because the data to be collected relates to a single specified time and also includes some historical information.

2.4 Sample size determination

A sampling frame of 814 participants was drawn from the study site (258 staff and 556 inmates). The number was used as the material for predetermining the number of participants. The sample was determined using the Yamane (1966) formula. The formula was used because it puts into consideration the population of the study.

$$n = \frac{N}{1 + N\,(0.5^2)}$$

Where

n is the desired sample size

N=the estimate of the population size

$$n = \frac{814}{1 + 814\,(0.05^2)}$$

$$268.204, \textit{so this was rounded to } 268 \textit{ as a participant is a discrete variable}$$

2.5 Sampling procedure

The study relied on multistage sampling, a process that entailed recruiting participants using smaller sampling units at each stage. The first stage was cluster sampling, a strategy that was based on a proportional rationale of categorizing potential participants in both Yatta and Machakos. The final list of respondents was picked using Research Randomizer, where the internet-based tool was employed in selecting the final list of participants. The selected numbers were circled from the pre-documented list of inmates.

2.6 Data collection, assurance and control

The mixed-method approach was used to allow triangulation which permits a more complete and synergistic utilization of data than to do separate quantitative and qualitative data. Quantitative data was collected using semi-structured questionnaires, whereby they focused on socio-demographic characteristics, family medical history, levels of health literacy, diabetes treatment compliance, or non-compliance. The key informant interviews (KIIs), were used to seek expert opinion from the medical staff. It gave the researcher a chance to learn more about the contextual factors that govern individual experiences on the management, giving more insight on the predictors of non-compliance to type II diabetes management.

2.7 Data Management, analysis and presentation

Quantitative data collected through the use of structured questionnaires was analyzed by SPSS version 20 software. The statistical software aided the study in analyzing both descriptive and inferential statistics. The data was first entered in Microsoft Excel, cleaning was done to detect, correct, or remove corrupt, inaccurate data to ensure quality data. The data was later imported into the SPSS and coded ready for analysis. Descriptive statistics were used to meaningfully describe distributions of scores and measurements. Descriptive analysis was used in exploring both demographic and study variables. Frequency distribution tables, bar charts, and percentages were used to present categorical data. For data that is normally distributed, mean and standard deviation were presented while the median and interquartile range was presented for skewed data. Bivariate analysis was employed to test the relationship between categorical variables, to establish whether there was an association and the strength of the associations and scatterplots was used for presentation. Chi-square was used to test the relationship between categorical variables for example socio-demographic factors and dependent variables. Logistic regression was used to estimate the association between socio-demographic factors (independent variable) and non-compliance to type II diabetes (dependent variables).

Qualitative data collected was primarily transcribed, themed, and coded in promptness for analysis. The deductive approach using the research questions was used to group the collected data whereby differences and similarities were considered. Thematic analysis was used to generate meaningful information from the data. That allowed the researcher to have a holistic picture of the predictors of non-compliance to type II diabetes management. A phenomenological approach was adopted to understand how the individuals experienced the disease, the management, and reporting the findings.

2.8 Ethical Considerations

A letter of introduction was obtained from Mount Kenya University's graduate school and was used to seek authorization from the Ethical Review Committee in Mount Kenya University. The two clearances for the proposal were used to apply for approval from the National Commission for Science, Technology, and Innovation, with the award permitted presented to County Director of Education and County Commissioner in Machakos to be granted permission to carry out the study. Clearance was also sought from the prison administration in Yatta and Machakos establishments.

The prison authorities were informed that participation was on voluntary basis. The purpose of the study was explained and the participants given full information pertaining to the benefits and possible risks of taking part in the study to enable them to give written or oral consent. Participants were informed that they are at liberty to terminate the interview at their will. The handling of the collected data, analysis, dissemination and use of the results was guided by ethical standards. All responses from the research participants were treated with the confidentiality, and not shared with third parties. Similarly, the identity of the respondents was anonymized by the Use of Codes Instead Of Their Names.

3. Results and Discussion

The objective of this study was to establish the predictors influencing non-adherence to type II diabetes management among adult inmates in Machakos County Prisons. The inmates were asked to give their responses on provider- patient relationship in their facilities.

3.1 Health Care Professionals at the Prison Facility

According to the study findings, 100% (177) of the respondents indicated that there no enough professionals at the prison clinic to serve those with type II diabetes, 72.9% (129) pointed out that they were served satisfactory lastly when they visited the clinic, 64.4% (114) indicated that they receive guidance and counseling at the clinic, 61% (108) indicated that the professionals are friendly at the clinic and 57.6% (102) indicated that they do not get screening and testing services at the prison.

3.2 Provider-Level Factors and Non-Adherence to Type II Diabetes Management

The study sought to establish the influence of provider-level factors on non-adherence to type II diabetes management. The results show that the amount spent to get prescribed drugs has no significant influence on non-adherence to type II diabetes management (p=0.893). The respondents who spend more than kshs 6000 to get prescribed drugs (OR= 0.488, 95%CI [0.150-1.590], p = 0.234), were more likely to be non-adherence to type II diabetes management as compared to those who spend between kshs 0 and 1000 (OR=0.990, 95%CI [0.546-1.796], p = 0.974) and between kshs 1001- 5000.

Table 1: Health Care Professionals at the Prison Facility

	Frequency		Percent	
	Yes	No	Yes	No
Enough professionals at the prison clinic to serve those with type II diabetes	0.00	177	0.00	100.0
Satisfaction with service when they last visited the clinic	129	48	72.9	27.1
Friendliness of the professionals at the clinic	108	69	61.0	39.0
Receiving guidance and counseling at the clinic	114	63	64.4	35.6
Getting screening and testing services at the prison	75	102	42.4	57.6

The results shows that adequacy of professionals at the prison clinic to serve those with type II diabetes has a significant influence on non-adherence to type II diabetes management (p=0.000). The participants who indicated that there were inadequate professionals at the prison clinic to serve those with type II diabetes (OR= 0.100, 95%CI [0.039-0.259], p-value=0.000) were more likely to be non-adherent to type II diabetes management as compared to those who have indicated that there were adequate professionals at the prison clinic to serve those with type II diabetes. This is in line with the ADA (2016) report that indicates that type II diabetes management in prisons depends on adequacy and training to medical staff as well as access to anti-diabetic agents and supplies.

The results show that satisfaction with service when they last visited the clinic has a significant influence on non-adherence to type II diabetes management (p=0.000). The results show that the respondents who are not satisfied with service when they last visited the clinic were more likely to be non-adherent to type II diabetes management (OR= 0.028, 95%CI [0.008-0.100], p = 0.000) as compared to those who are satisfied with service when they last visited the clinic. The findings agree with Krot and Rudawska (2016) observation that patient satisfaction and a good understanding of the content given by the provider improves compliance hence it is essential a good relationship be established. Trusting a provider contributes to increased patient satisfaction ensuring likelihood to comply with medication as observed by Zineldin (2015). Mistrust leads to doubting the medical advice given hence non-compliance to medication (Krot & Rudawska, 2016).

The results also indicates that friendliness of the professionals at the clinic has a significant influence on non-adherence to type II diabetes management (p=0.001). The professionals who are not friendly at the clinic (OR= 4.421, 95%CI [1.898-10.298], (p = 0.001) were more likely to be non-adherent to type II diabetes management as compared to professionals who are friendly at the clinic. Patient-provider relationship is a resilient factor that affects compliance to medication, Lawson *et al* (2005), found that a healthy relationship existing between a patient and a provider increases trust in providers.

The study indicates that receiving guidance and counseling at the clinic has significant influence on non-adherence to type II diabetes management (p=0.011). The respondents who do not receive guidance and counseling at the clinic (OR= 0.421, 95%CI [0.214-0.827], p = 0.110) were more likely to be non-adherence to type II diabetes management as compared to those who receive guidance and counseling at the clinic.

The results show that getting screening and testing services at the prison has no significant influence on non-adherence to type II diabetes management (p=0.614). The results show that the respondents with don't get screening and testing services at the prison were more likely to be non-adherence to type II diabetes management (OR= 0.864, 95%CI [0.462-1.577], p = 0.614) as compared to those who get screening and testing services at the prison. This study confirms the findings of HMPS/DoH, (2001).

The results indicates that the ability to access health information has a significant influence on non-adherence to type II diabetes management (p=0.000). The respondents who are not able to access health information (OR= 0.074, 95%CI [0.035-1.55], p = 0.000) were more likely to be non-adherence to type II diabetes management as compared to those who are able to access health information.

The findings indicates that doctors giving prisoners information on diabetes has a significant influence on non-adherence to type II diabetes management (p=0.000). The prisoners who don't receive information on diabetes (OR= 6.577, 95%CI [3.043-14.213], p = 0.000) were more likely to be non-adherent to type II diabetes management as compared to prisoners who receive information on diabetes. These findings agree with Zineldin (2015) observation that good communication is essential to help the patient understand his condition and therapy hence increasing compliance.

The findings shows that involvement in treatment decisions has a significant influence on non-adherence to type II diabetes management (p=0.000). The respondents who are not involved in treatment decisions (OR= 0.154, 95%CI [0.061-0.385], p = 0.000) were more likely to be non-adherent to type II diabetes management as compared to those who are involved in treatment decisions.

The results show that facing discrimination and harassment when seeking medical attention has no significant influence on non-adherence to type II diabetes management (p=0.790). The results show that the respondents with don't face discrimination and harassment when seeking medical attention were more likely to be non-adherence to type II diabetes management (OR= 1.108, 95%CI [0.603-2.035], p = 0.741) as compared to those who face discrimination and harassment when seeking medical attention.

The results indicates that feeling comfortable to ask questions to the doctor has no significant influence on non-adherence to type II diabetes management (p=0.009). The participants who strongly disagreed with the statement (OR = 3.704, 95%CI [1.405-9.763],

p = 0.009) were more likely to be non-adherence to type II diabetes management as compared to those who disagreed (OR = 3.199, 95%CI [1.330-7.695], p = 0.009) and those who strongly agreed.

Table 2: Provider-Level Factors and Non-Adherence to Type II Diabetes Management

	Non-Adherence to Type II Diabetes Management	OR(95%CI)	*p* value
Amount Spent to Get Prescribed Drugs			**.893**
kshs 0- 1000	3(100)	.990(0.546-1.796)	.974
kshs 1001- 5000	101(67.3)	1.207(0.438-3.331)	.716
kshs Above 6000	6(25.0)	.488(0.150-1.590)	.234
Adequacy of professionals at the prison clinic to serve those with type II diabetes			**.000**
Yes	23(51.1)		
No	87(65.9)	.100 (0.039-0.259)	.000
Satisfaction with service when they last visited the clinic			**.000**
Yes	84(65.1)		
No	26(54.2)	.028 (0.008-0.100)	.000
Friendliness of the professionals at the clinic			**.001**
Yes	68(63.0)		
No	42(60.9)	4.421(1.898-10.298)	.001
Receiving guidance and counseling at the clinic			**.011**
Yes	63(55.3)		
No	47(74.6)	0.421(0.214-0.827)	.011
Getting screening and testing services at the prison			**.614**
Yes	45(60.0)		
No	65(63.7)	0.864(0.462-1.577)	.614
Ability to access health information			**.000**
Yes	21(29.2)		
No	89(84.8)	0.074(0.035-1.55)	.000
Doctors giving prisoners information on diabetes			**.000**
Yes	57(59.4)		
No	53(65.4)	6.577(3.043-14.213)	.000
Involvement in treatment decisions			**.000**
Yes	47(65.3)		
No	63(60.0)	.154(0.061-0.385)	.000
Facing discrimination and harassment when seeking medical attention			**.741**
Yes	57(63.3)		
No	53(60.9)	1.108(0.603-2.035)	.741
Feeling Comfortable To Ask Questions to the Doctor			**.009**
Strongly agree	14(51.9)		
Agree	24(57.1)	0.359(0.109-1.184)	.092
Not sure	36(66.7)	0.444(0.147-1.346)	.151
Disagree	18(60.0)	3.199(1.330-7.695)	.009
Strongly disagree	18(75.0)	3.704(1.405-9.763)	.008

4. Discussion

The findings indicates that doctors giving prisoners information on diabetes has a significant influence on non-adherence to type II diabetes management (p=0.000). The prisoners who don't receive information on diabetes (OR= 6.577, 95%CI [3.043-14.213], p = 0.000) were more likely to be non-adherent to type II diabetes management as compared to prisoners who receive information on diabetes. These findings agree with Zineldin (2015) observation that good communication is essential to help the patient understand his condition and therapy hence increasing compliance. The findings agree with Krot and Rudawska (2016) observation

that patient satisfaction and a good understanding of the content given by the provider improves compliance hence it is essential a good relationship be established. Trusting a provider contributes to increased patient satisfaction ensuring likelihood to comply with medication as observed by Zineldin (2015). Mistrust leads to doubting the medical advice given hence non-compliance to medication (Krot & Rudawska, 2016).

Conclusion

The study concludes that provider- related factors statistically influence non-adherence to type II diabetes management among adult inmates in Machakos County prisons. Specially, lack of provision of guidance and counselling to patients, adequacy of professionals at the prison clinic to serve those with type II diabetes, satisfaction with service when they last visited the clinic, friendliness of the professionals at the clinic, doctors giving prisoners information on diabetes and involvement in treatment decisions, feeling comfortable to ask questions to the doctor had an influence on non-adherence to type II diabetes management among adult inmates. Nonetheless, facing discrimination and harassment when seeking medical attention had no significant influence on non-adherence to type II diabetes management.

Recommendations

The study found that adult inmates were not involved in treatment decisions. This study therefore recommends that the doctors in prison clinics should spend adequate time with the inmates explaining important information on diabetes to help the patient understand his condition and encourage him to start and maintain therapy. Patient satisfaction and a good understanding of the content given by the provider improve compliance to type II diabetes management among adult inmates. The study found that there are no enough professionals at the prison clinic to serve those with type II diabetes. This study therefore recommends that the government should increase the number of health experts at the prison clinics to enhance close contact between inmates and medical practitioner. Employing adequate professionals will help improve adherence to type II diabetes management as the patients will continuously get updated with information on diabetes management and the healthcare providers will be in a position to easily detect and monitor the progress and onset of type II diabetes complication. The study found that receiving guidance and counseling at the clinic led to a reduction in non-adherence to type II diabetes management among adult inmates. As such, the study recommends that Machakos County prisons should focus on providing guidance and counseling at the prison clinics as a way of improving diabetes management among adult inmates. In addition, more than one third of the patients were facing discrimination and harassment when seeking medical attention and were feeling comfortable to ask questions to the doctor. Therefore, the study recommends that the health care providers in prison clinics should ensure that they are friendly to the diabetic prisoners so as to create an environment where they can seek for more information in regard to diabetes management.

Acknowledgements

Much appreciation to all participating inmates, staff and management of Yatta and Machakos GK prisons.

Conflicts of interest

The author declared no conflicts of interest.

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