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Abstract

Purpose: To examine the effect of healthcare provider patient communication nonverbal communicative behaviour on diabetes mellitus management practices in selected hospital in Kenya.

Methodology: This was a causal comparative research design study with application of quantitative methodology. The study was carried out at Kenyatta National Hospital (KNH) and MP Shah Hospital. Systematic random sampling was used to sample patients. 400 participants were involved in the study and comprised 313 patients at KNH and 87 patients at MP Shah Hospital studied between the months of February 2019 and November 2019. The researcher administered questionnaire was used to collect data. The results were summarized using percentages and means or medians for categorical and continuous data respectively. Comparisons were done using chi square test of association of categorical variables and independent t-test for comparison of means. Linear regression and ANOVA were used to test for associations and hypothesis between healthcare provider patient nonverbal communicative behaviour (NVCB) and diabetes mellitus management practices (DMMPs).

Findings: The rating of nonverbal communicative behavior was significantly higher at MP Shah Hospital than at KNH, p=0.010. Nonverbal communicative behavior had positive significant effect on diabetes mellitus management practices in Kenya [β=0.15, (95% CI 0.03, 0.27), p=0.016] with similar outcome at KNH [β=0.20, (95% CI 0.08, 0.33), p=0.002] and not at MP Shah Hospital [β=0.03, (95% CI 0.37, 0.42), p=0.899]. Thus, the null hypothesis was rejected in Kenya; the null hypothesis was rejected at KNH; the null hypothesis was not rejected at MP Shah Hospital. Therefore, there was significant effect of NVCB on DMMPs in Kenya, at KNH and not at MP Shah Hospital.

Unique contribution to theory, practice and policy: Nonverbal communicative behaviour was responsible for improved performance in diabetes mellitus management practices among patients in Kenya and at KNH. At MP Shah Hospital, NVCB was not responsible for improvement in the DMMPs. The findings reinforce uncertainty reduction and communication accommodation theories basis in the dyadic interaction between patients and healthcare providers. Therefore, NVCB needs to be well conceptualized and incorporated at the health ministry and medical training institutions to equip medical workers with the required communication skills.

Key words*: Healthcare provider patient communication, Nonverbal Communicative Behaviour, Diabetes Mellitus Management Practices, Patients, Healthcare providers.*

1.0. INTRODUCTION

Diabetes mellitus is a complex disease that requires continuing medical care and life-long patient education. Survey results in western studies repeatedly reinforce this complexity and highlight treatment compliance challenges associated with behavioral changes and multiple medication regimens (Merz, Buse, Tuncer & Twillman, 2002). Although considerable evidence supports the use of pharmacological interventions in diabetes care, the best way to improve health outcomes using non-pharmacological 'complex interventions' is often unclear. A number of complex interventions target improvements in patients, providers and organisational aspects of diabetes care (Borgermans, Goderis, Broeke, Mathieu, Aertgeerts, Verbeke, Carbonez, Ivanova, Grol & Heyrman, 2008). Because diabetes mellitus (DM) also requires lifestyle modifications, the patient needs to be clearly informed about the many different aspects of DM management. It is helpful for patients to understand why ongoing monitoring of such variables as glycated hemoglobin (A1C) levels and proper diet and exercise regimens are important (Campos, 2006). Diabetes is essentially a self-managed disease and therefore requires patients to have a degree of autonomy motivation to successfully perform optimal self-management. Diabetes health care providers know that if only their patients adhered to their treatment recommendations, they could do well and avoid diabetes related complications (Delamater, 2006).

Diabetes is a major public health problem that is approaching epidemic proportions worldwide and largely associated with lifestyle changes in emerging economies. The worldwide prevalence of both types 1 and 2 DM among adults was 285 million (6.4%) in 2010 and is predicted to rise to around 439 million (7.8%) by 2030 (Musenge, Michelo, Mudenda & Manankov, 2015; Qiu, Sun, Cai, Liu & Yang, 2012). Diabetes is emerging as an epidemic of the 21st Century and threatens to overwhelm the health care system in the near future. It imposes a high economic burden in terms of health care expenditure, lost productivity and foregone economic growth, hence the need for public health interventions to prevent diabetes or delay the onset of its complications that entail intensive lifestyle modification for those at risk of diabetes and aggressive treatment for those with the disease. The Centers for Disease Control and Prevention reported that 25.6 million, or 11.3%, of US adults aged 20 or older had diagnosed or undiagnosed diabetes and noted that instituting management programs with better communication between patients and physcians contributed to better adherence to medication and adjustment processes and that more personalised patient-centered interactions help patients and providers set behavioural and clinical goals (Stellefson, Dipnarine & Stopka, 2013). Diabetes mellitus deaths in Kenya reached 5,831 or 1.84% of total deaths. The age adjusted death rate was 42.44 per 100,000 of population ranking Kenya #74 in the world. The International Diabetes Federation estimated the prevalence of diabetes in Kenya to be about 3.3% in 2007. However, local studies have shown prevalence of 4.2% in the general population with a prevalence rate of 2.2% in the rural areas and as high as 12.2% in urban areas (Kiberenge, Ndegwa, Njenga & Muchemi, 2010).

Communication between health professionals and patients include the ability to express sincere concern for the care of the patient and the patient becomes a partaker of this interest. What of course in any case should be avoided by the caregivers is silence and indifference to the questions of the patient. In the best cases, the patient will leave disappointed and in the worst really indignant with healthcare provider (Kourkouta & Papathanasiou, 2014). Much of what is

conveyed between a physician and patient in a clinical encounter occurs through nonverbal communication. For both physician and patient, images of body language and facial expressions will likely be remembered longer after the encounter than any memory of spoken words. Simple choices in words, information depth, speech patterns, body position, and facial expression can greatly affect the quality of one-to-one communication between the patient and physician (Travaline, Ruchinskas, D'Alonzo, Jr., 2005). Nonverbal behaviors associated with favorable outcomes include less mutual gaze, head nodding of the provider, forward lean, more direct body orientation, uncrossed legs and arms, and arm symmetry. The behaviors associated with unfavorable outcomes include more patient gaze, body orientation 45 to 90 degrees away from the patient, indirect body orientation, backward lean, crossed arms, task touch, and frequent touch. No association was found for the following behaviors: sideways leaning, leg position, arm position asymmetry, amount of physician touch, and physician-patient distance (Beck, Daughtridge & Sloane, 2002). Nonverbal behaviors that are thought to imply power or dominance have been reported as negatively impacting patient outcomes that include interruptions and silence. Physician speed and volume of talking correlated with patient satisfaction levels. Physicians with previous malpractice claims are significantly connected to ratings of lower concern in tone of physician voice and higher dominance. Conversely, physicians' use of positive words delivered in a negative tone resulted in higher patient satisfaction levels (Mickel, McGuire & Gross-Gray, 2013). Greater clinician warmth, less nurse negativity, greater clinician listening and affiliative nonverbal behavior of the physician are associated with greater patient satisfaction (Henry, Fuhrel-Forbis, Rogers, Eggly, 2012). However, how different physician nonverbal behaviors are related to patient satisfaction also depends on personal attributes of the physician such as gender (Mast, 2007).

Therefore, there is much for patients to understand about diabetes, its long-term management, the prevention or management of complications, and how to maintain or improve their quality of life. As a result of patient empowerment and education, patient behaviors may change and lead to improved A1C, blood pressure, lipids, or weight, reduced medication needs, and lower use of health care services (Glasgow, Funnell, Bonomi, Davis, Beckham & Wagner, 2002; Duncan, Birkmeyer, Coughlin, Li, Sherr, Boren, 2009). Today's patients want to be partners in health care decision making; they no longer want to be told what to do. They want reasoning and proof to replace a patient-physician relationship that was traditionally built on blind trust. If patients are included as fully informed partners in their care, there will be increased satisfaction and better compliance and retention rates. In the process, the physician will discover more satisfaction in work, renewed motivation and increased productivity (Belzer, 1999). Aspects of the patient-physician relationship such as communication and empathy have been shown to be important to patient's adherence and ability to complete self-care tasks (Bonds, Camacho, Bell, Duren-Winfield, Anderson & Goff, 2004). Patients are expected to follow a complex set of behavioral actions to care for their diabetes on a daily basis. These actions involve engaging in positive lifestyle behaviors, including following a meal plan and engaging in appropriate physical activity; taking medications when indicated; monitoring blood glucose levels; responding to and self-treating diabetes-related symptoms; following foot-care guidelines; and seeking individually appropriate medical care for diabetes or other health-related problems. The proposed regimen is further complicated by the need to integrate and sequence all of these behavioral tasks into a patient's daily routine (Shrivastava, Shrivastava & Ramasamy, 2013).

In a study of 222 Chinese adults with type 2 diabetes, it was noted that better provider patient communication, in addition to social support and higher self-efficacy is associated with performing diabetes self-care behaviors that are directly linked to glycemic control (Gao, Wang, Zheng, Haardörfer, Kegler, Zhu & Fu, 2013). In India, both patient factors and clinician related factors were noted as critical in the management of diabetes (Shrivastava, Shrivastava & Ramasamy, 2013). Accurate understanding of patient perceptions of diabetes impact and its seriousness is important in effective patient-physician communication and diabetes management as adherence to medication is a key contributor to diabetes treatment outcome and therefore poor adherence results in worse glucose control and increased hospital admissions of patients due to diabetes complications (Wangnoo, Maji, Das, Rao, Moses, Sethi, Unnikrishnan, Kalra, Balaji, Bantwal, Kesavadev, Jain & Dharmalingam, 2013). In Middle East, research pointed out the significance of effective communication and continuity of care as factors affecting quality of diabetic care in primary care. Patients prefer to see the same doctor/nurse during their regular visits because this increases patients' satisfaction, confidence and trust toward health professionals (Mochtar & Al-Monjed, 2015). Healthcare professionals in United Arab Emirates (UAE) revealed that communication skills such as encouraging patients to take part in consultations, keeping good eye contact and attentive listening helped to facilitate better interaction between themselves and their patients, hence resulted in increased level of motivation regarding the management of their patients (Alhyas, Nielsen, Dawoud & Majeed, 2013). In Saudi Arabia patient dissatisfaction with health care given to them related in most cases to the problem of poor doctor-patient communication (Elzubier, 2002). A study in Iran noted that patients with diabetes play an important role in the management of their illness and should be involved in the intervention program to be able to improve their quality of life (Moattari, Ghobadi, Beigi & Pishdad, 2012). Effective patient–physician communication may be particularly important, with evidence that patients practiced better self-management when their providers had superior communication skills (Kadirvelu, Sadasivan & Hui Ng, 2012). Shams & Barakat, 2010 in a study in Egypt did argue that further research studies should emphasize the importance of effective patient-health care provider communication in overcoming some of the barriers to therapeutic compliance.

Studies in Africa, though few, have espoused the importance of healthcare provider patient communication. Communication is the key to a therapeutic relationship between the doctor and the patient especially when dealing with patients who have chronic conditions such as diabetes. This relationship has been shown to be one of the factors with the most influence on patient satisfaction, and, in turn, on adherence (Diab, 2012). In South East Nigeria, people with diabetes have the responsibility to manage their condition on a day to day basis, communicate with their healthcare provider periodically throughout the year and seek advice when necessary and that to effectively self-manage diabetes, those with the disease must identify symptoms of emerging health crises, adhere to complex medication schedules and modify long-standing lifestyle behaviors such as their diet and physical activity levels(Nwankwo, Nandy & Nwankwo, 2010). A study in south western Nigeria showed that poor dietary adherence and self-management practice are possible indicators for diabetes primary care providers to always ensure active involvement of patients in diabetes treatment plans in order to consistently guarantee improved treatment adherence, and subsequently optimal glycemic outcome (Adisa & Fakeye, 2014).

In kenya, though there are no studies specific on how communication affect diabetes management, local studies have focussed more on information for the patient through educational and couselling programs by the healthcare provider, and even though communication takes place during the interactions, it's effectiveness should be ascertained. A study noted that knowledge about diabetes mellitus is prerequisite for individuals to take action to control the disease, and diabetes education, with consequent improvements in knowledge, attitudes and skills, would lead to better control of the disease, and is widely accepted to be an integral part of comprehensive diabetes care. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease and it is equally important to design and implement suitable diagnostic, management and treatment protocols for people with diabetes (Kiberenge, et al. 2010). Therefore,the the purpose of the current study is to examine and demonstrate how the nature of nonverbal communicative behaviour between the healthcare provider and the patient affect diabetes mellitus management and how the outcome of the study will subsequently bridge any communication gaps inherent and thereby enrich and improve on DMMPs.

1.1. Statement of the Problem

The communication process among patients, nurses and other health workers is still not considered to be very effective as difficulties are observed in clinical practice between professionals and patients, which strongly affect satisfaction, treatment adherence, and, consequently health outcomes (Damasceno, Zanetti, Carvalho, Teixeira, Araújo & Alencar, 2012). Physcians have grown used to giving orders to diabetes patients without necessarily realizing the extra burden those orders place on the person with diabetes (Alzaid, 2014). Nurse communication plays a pivotal role in supporting patient health, unfortunately, less than 20% of T2DM patient reach all three targets for blood glucose (HbA1C), lipids levels, and blood pressure (Mulder, Lokhorst, Rutten & van Woerkum, 2014).

The quality of the nurses' consultations is sub-optimal in about 75% of 85% consultations regarding aspects of consultation environment, care and information (Abdulhadi, Al-Shafaee, Östenson, Vernby & Rolf Wahlström, 2006). Medical encounters are characterized by more of physicians' dominance and less of attention to the patients' concerns, expectations and role in their own diabetes management and self-monitoring (Abdulhadi, Al Shafaee, Freudenthal, Östenson & Wahlström, 2007). DM requires a complex assortment of time-sensitive communications activity and interventions to avert serious complications and the dominant unidirectional clinician-biased forms of communication employed by healthcare professionals were a major barrier (Forbes, Sidhu & Singh, 2011) and as many as 50% of patients leave the hospital visit not knowing what they are supposed to do to take care of themselves (Heisler, Bouknight, Hayward, Smith & Kerr, 2002). Effective physician communication is significantly positively correlated with patient adherence and there is a 19% higher risk of nonadherence among patients whose physician communicates poorly than among patients whose physician communicates well (Zolnierek & DiMatteo, 2009). Despite the appropriate diabetic management practices, patients are noted to move from one healthcare provider to another or change facility with the belief that they will be be served better elsewhere. Again, diabetic patients in Africa have reported that the major concern in patient care is the lack of follow up (Azevedo & Alla, 2008). Though communication always takes place in healthcare provider patient encounters, its

quality and effectiveness is of significance in regard to the desired health outcomes, as poor communication can negatively influence DM management (Campos, 2006). Often, providers are unaware of the communication needs of their patients and do not tailor their communication styles to fit patients' needs (Ngo-Metzger, 2006).

In spite of the great strides that have been made in the treatment of diabetes in recent years, many patients do not achieve optimal outcomes and still experience devastating complications that result in a decreased length and quality of life (Funnell & Anderson, 2004). Less than half of persons with diabetes meet the recommended levels of HbA1c, blood pressure and lipid control. Additionally, poorly managed diabetes is associated with serious complications including stroke, blindness, heart disease, kidney disease, nerve damage, amputations, and death (Alhodaib & Hala, 2014). The above studies show evidence that healthcare provider patient nonverbal communicative behaviour's place in the management of diabetes is critical. It is therefore important to examine the effect of healthcare provider patient nonverbal communicative behaviour on diabetes mellitus management practices in Kenya in order to understand how communication is used during the interaction between the healthcare provider and the patient as a tool to improve diabetes mellitus management practices. This will hence seek to address the gaps as observed in regard to: the dominance and pertanalistic attitude by the healthcare provoders over patients during interractions as the patients are not given the opportunity to fully and equally participate in the medical encounters; the distinct dissonance found between a communicative style by healthcare providers that focuses on medical information compared with a patient-centered communicative style and the lack of consistency in nonverbal communicative behaviour through all subsequent consultations and interactions.

1.2. Objective: To establish the effect of healthcare provider patient nonverbal communicative behaviour on diabetes mellitus management practices in selected hospitals in Kenya.

1.3. Hypothesis: There is no significant effect of nonverbal communicative behaviour during healthcare provider patient interaction on diabetes mellitus management practices in selected hospitals in Kenya.

2.0. LITERATURE REVIEW

The quality of provider patient communication can affect numerous outcomes, including patient adherence to recommendations and health status (Healthy People, 2010). Patients' expectations and perceptions of the medical encounter and interactions are important tools in diabetes management. Some problems regarding the interaction during encounters may be related to a lack of communication skills on the part of either the physician or the patient (Abdulhadi et al, 2007). The problems encountered during communication are not solely the fault of the physician and it has been noted that 76% of the patients' main worries are not mentioned to the doctor (Chatterjee, 2006).

Thus, there is need for research to fill gaps in knowledge on healthcare provider patient nonverbal communicative behaviour. While there is some evidence for ways to reduce communication difficulties in studies done elsewhere, there is little known about the most effective and efficient ways to overcome communication difficulties between patients and healthcare providers in Kenya. Generally, there is empiric evidence of problems related to

healthcare provider patient nonverbal communicative behaviour and how these problems may lead to poorer care and outcomes, hence, there is an opportunity and a need to improve and extend the evidence base on the effect of healthcare provider patient nonverbal communicative behaviour on diabetes mellitus care and outcomes. Miscommunication and misunderstanding in clinical practice has widened the communication gap between patient and healthcare providers (Schirmer, Mauksc, Lang, Marvel, Zoppi, Epstein, Brock & Pryzbylski, 2005). There is a gap in regard to dominance as the patient are not given the opportunity to fully and equally participate in the medical encounters. The study by Abdulhadi et al, 2006 & Abdulhadi et al, 2007, revealed that the medical encounters were characterized by more of physicians' dominance and less of attention to the patients' concerns, expectations and role in their own diabetes management. Too, healthcare providers focus more on diabetic indicators to make decisions on treatments through checklisting, hence a distinct dissonance found between a communication style that focuses on medical information compared with a patient-centered communication style (Kruse, Olsberg, Shigaki, Oliver, Vetter-Smith, Tamara M. Day & LeMaster, 2013).

Healthcare providers need communication skills to cope with patients' expectations and evidence based goals in a tailored approach to diabetes care (Wens, Vermeire, Van Royen, Sabbe & Deneken, 2005) as a bridge to resolving the paternalistic attitude that arises out of frustration, due to communication difficulties inherent between the provider and patient. In regard to Hacker, Choi, Trebino, Hick, Friedman, Blanchfield & Gazelle, 2012, language concordance challenges inherent in providing services to a diversifying population deserve further study to determine the best policy and practice strategies to achieve this goal and to ascertain whether this is unique to the study population or generalizable elsewhere like Kenya. Sarkar, Piette, Gonzales, Lessler, Chew, Reilly, Johnson, Brunt, Huang, Regenstein & Schillinger, 2008 noted that many patients reported an unmet need for better communication to support their efforts to self-manage their condition and given the high prevalence of limited health literacy and the extent to which patients, particularly racial/ethnic minorities perceive a benefit of improved provider communication for their diabetes control, the design and delivery of self-management support interventions should directly address the communication barriers experienced by vulnerable groups. According to Piette, Schillinger, Potter & Heisler, 2003; Lyles, Sarkar, Ralston, Adler, Schillinger, Moffet, Huang & Karter, 2012, though providers in the study sites were communicating successfully with vulnerable patients, findings support the traditional advice to physicians to treat the whole patient, not just their disease, insofar as success across both dimensions of communication is associated with better self-care in a variety of critical areas.

In addition, important to explore is consistency in communication through all subsequent consultations, where the health outcome of outpatients with NIDDM may possibly benefit if the compatibility in communication between doctor and patient during the initial contact are maintained during repeat consultations. Findings suggest that once the doctor patient relationship has been established, less effort is put into maintaining it what might engender, however, a risk of overlooking important cues, such as psychosocial issues, which are known to be related to the compliance and general well-being of the patient with NIDDM (Dulmen, van, Verhaak & Bilo, 1997). Communicative behaviour in regard to Heisler et al, 2002 it was noted that participatory decision-making style is unimportant, but it does suggest that perhaps the most critical pathway may be its impact of facilitating information exchange and overall communication as an aspect of healthcare provider patient communication effect on diabetes management. Therefore, the

gaps between optimal evidence based medicine and actual practice can be great, dependent not only on the ability of the clinician to make changes in practice patterns but also on the central role of the patient in implementing optimal management plans in daily life (Marrero, Ard, Delamater, Peragallo-Dittko, Mayer-Davis, Nwankwo & Fisher, 2013).

The quality of doctor patient interaction is therefore an important determinant of glycemic control and healthcare outcome for people with diabetes. Thus, communication should be considerded a universal first-line therapy in any future guidelines made for the treatment of diabetes as communication and intrpersonal skills of physcians are at the heart and soul of the proffession of medical doctors (Alzaid, 2014). Communication in the health care environment has multiple layers that both help and hinder the processes vital to its proper functioning (Mickel, McGuire & Gross-Gray, 2013). Interpersonal communications related to healthcare delivery between patients and healthcare providers does take up a considerable amount of time (Jirjis, Weiss, Giuse, Ing, & Rosenbloom, 2005) and the quality of interpersonal care processes is associated with patients' self-care behavior and health outcomes for a number of conditions, including diabetes (Schillinger, Bindman, Wang, Stewart & John Piette, 2003). Communication problems between patient and provider can cause difficulties in the effective delivery of health care, hence a supportive consultation environment with a warm and caring physician and a good patient-physician interaction is particularly important in diabetes care (Teutsch, 2003).

A qualitative study in Muscat, Oman identified a number of weak areas concerning patient provider interactions and health care services in diabetes clinics. This were unfriendly welcoming; interrupted consultation privacy; poor attention and eye contact; lack of encouraging the patients to ask questions on the providers' side and lack of information transfer in particular with regard to blood investigations, information about medicines, hypoglycaemia and self-monitoring of blood glucose, but also patient barriers like traditional unhealthy food beliefs and low education among patients with diabetes; and inability to participate in medical dialogue or express concerns on the patients' side. Medical encounters in the health centers were characterized by more of physicians' dominance and less of attention to the patients' concerns, expectations and role in their own diabetes management and self-monitoring. Several patients had no interactions with the health educators or dieticians, irrespective of the duration of their diabetes. Long waiting time up to four or five hours' despite being given appointments is an issue that was raised spontaneously by almost all the patients and was expressed as stressful and unacceptable (Abdulhadi et al, 2007). What patients tend to rely upon to make sense of health challenges are the physical symptoms that they are experiencing at a given time. Providers often engaged in checklisting-a rapid review of several diabetes indicators, treatments, and practices. While numbers such as hemoglobin A1C play an important role in diabetes management, patients seemed unable to relate them to how well or poorly they felt, perhaps leading to reduced interest in some self-care activities. Checklisting can become so routinized as to pull the conversation away from other concerns as it does not necessarily lead to an in-depth conversation about the relationship between self-care and the measures. These encounters highlight the contrast between how patients and providers view and use measurable indicators (Kruse et al, 2013).

Communication during medical interactions therefore plays a central role in decisions about subsequent interventions that includes efforts to assist patients in reaching their personal health

goals (Ngo-Metzger, 2006) as patients' involvement in their health care is likely to reduce errors, adverse events, and nonadherence to treatment (Lovel, 2010). Good communication is associated with patient adherence to treatment, control and resolution of symptoms; control of pain, patient satisfaction, emotional health, function and physiologic measures (Weir, 2012; Stewart, 1995) and it is also associated with better physical and functional health outcomes among patients with diabetes, likely because of links to patient adherence and improved chronic disease self-management (Haskard, Williams, DiMatteo, Rosenthal, White, Michael & Goldstein, 2008). Therefore, success in coping with diabetes mellitus demands and treatment depends on many factors, among which effective communication between patients and health workers stands out (Damasceno et al, 2012). Two components of successful teamwork in healthcare are provider patient communication and shared decision-making, both of which have been shown to improve patient satisfaction, adherence to treatment plans, and health outcomes (Beverly, Wray, Chiu & LaCoe, 2014). Satisfaction with both the effectiveness of the provider's communication and participatory decision-making styles are important predictors of diabetes self-care behavior, an outcome that appears to be mediated by enhanced patient understanding of diabetes care and confidence in self-management skills and knowledge (Brown, Ettner, Piette, Weinberger, Gregg, Shapiro, Karter, Safford, Waitzfelder, Prata & Beckles, 2004).

Effective patient–physician communication can promote behaviors such as daily monitoring, which is an important part of the patient role in diabetes self-management (Quinn, Royak-Schaler, Lender, Steinle, Gadalla & Zhan, 2011) for effective diabetes management (Cinar & Schou, 2014; Nam, Chesla, Stotts, Kroon & Janson, 2011). Patient physician communication significantly affect patient decisions about their health practices and the behaviors that are associated with diabetes outcomes (Quinn et al, 2011). The manner in which a physician communicates information to a patient is as important as the information being communicated. Patients, who understand their doctors, are more likely to acknowledge health problems, understand their treatment options, modify their behavior accordingly, and follow their medication schedules. Effective patient-physician communication can improve a patient's health as quantifiably as many drugs, perhaps providing a partial explanation for the powerful placebo effect seen in clinical trials (Travaline, Ruchinskas & D'Alonzo Jr., 2005). Thus, the incorporation of well structured healthcare provider patient nonverbal communicative aspects during medical encounters could have immense and positive impact on the diabetic mellitus management practices.

2.1. Theoretical Framework

This study uses two theoretical frameworks, that is, uncertainty reduction theory and communication accommodation theory. These two theories seek to explain how individuals plan, activate and create effective and sometimes ineffective goals and messages, and how individuals process, appraise and cope with incoming information and uncertainty, situations that are very common in healthcare; situations similar to what is under investigation in this study.

2.1.1. Uncertainty reduction theory

The first theoretical framework that informs this study is uncertainty reduction theory. This theory generally concentrates on the reduction of the high level of cognitive uncertainty present in an initial interaction. It also distinguishes between a predictive component and an explanatory component. In formulating their uncertainty reduction theory Berger and Calabrese attempted to

model the processes through which communication is used to reduce uncertainty in an initial interaction between strangers (Berger & Calabrese, 1975). As one of the uncertainty theories, it is an individually-centered theory that was originally developed to explain initial communication interactions between strangers. Central to its claim is the assumption that an individual's primary goal in initial communication is to increase predictability and decrease uncertainty of one's own behaviors and the behaviors of others. In time, theorists began to broaden URT's scope of application to explain uncertainty in interpersonal communication in general as opposed to solely in initial interactions. One such application was in healthcare communication. Scholars found uncertainty to play a vital role in shaping provider-patient interaction as patients face uncertainty, including symptom attribution, state of the illness, treatment options and prognosis, social roles and predicting the effect of the illness on friends, family, and personal long-term plans (Bylund, Peterson & Cameron, 2012).

Information exchange is a basic human function in which individuals request, provide, and exchange information with the goal of reducing uncertainty. Uncertainty Reduction Theory (URT) recognized that reducing uncertainty was a central motive of communication. It was developed to describe the interrelationships between seven important factors in any dyadic exchange; verbal communication, nonverbal expressiveness, information-seeking behavior, intimacy, reciprocity, similarity, and liking (Berger & Calabrese 1975). From those concepts, the researchers introduced a collection of axioms, supported by past uncertainty research. Each axiom states a relationship between a communication concept and uncertainty. From the basis of axioms, the theorists were able to use deductive logic to infer twenty-one theorems that comprise the theory of uncertainty reduction. Uncertainty is unpleasant and therefore motivational; people communicate to reduce it. Uncertainty reduction follows a pattern of developmental stages (entries, personal, exit). Much of the interaction in this entry phase is controlled by communication rules and norms, characterized by the granting of essential demographic information (Berger & Calabrese 1975). During personal phase, the communicators feel less constrained by rules and norms and tend to communicate more freely with each other, reveal attitudes, beliefs, and more personal information. During the exit phase, the communicators decide on future interaction plans, characterized by the granting of less information and by the avoidance of communication altogether. However, any particular conversation maybe terminated at the end of the entry phase. Besides the stages in uncertainty reduction patterns, there is a distinction between three basic ways people seek information about another person (Berger, 1986). Of interest is the area between the entry and personal phases. Here, where trust is a formed, passive, active, and interactive strategy can reduce uncertainty and facilitate a more productive relationship. Passive strategies include unobtrusive observation of a person while active strategies might include finding out about the person from others. In the case of the doctor-patient relationship, the doctor might read the case-history notes of another practitioner or take a briefing about the patient from another practitioner. Interactive strategies, on the other hand, are dialogic and conversational in nature. The model holds that, together with passive and active strategies, dialogue and especially increased frequency of dialogue, builds coalitions.

In addition to the identification of the three 'relationship' phases, Berger and Calabrese's work offers a number of axioms from which are derived a range of theorems. Of the axioms, most pertinent is that as the amount of verbal communication between strangers' increases, uncertainty decreases and that as the number of non-verbal affiliative expressions increase,

uncertainty decreases. Of the theorems, those most relevant are: that quantum of speech and quantum of non-verbal communicative expressions are positively related; that quantum of talking and level of intimacy are positively related; and that quantum of non-verbal expression and level of intimacy are positively related (Bylund, Peterson & Cameron, 2012). URT interrogates the nature of initial meetings between strangers, such as the first consultation between patient and doctor and suggests how the inevitable uncertainty between such dyadic encounter might be overcome. The theory integrates most of the study concepts directly and indirectly as discussed above.

2.1.2. Communication accommodation theory

Communication accommodation theory (CAT) was developed by Howard Giles in 1973, argues that "when people interact they adjust their speech, their vocal patterns and their gestures, to accommodate to others". It explores the various reasons why individuals emphasize or minimize the social differences between themselves and their interlocutors through verbal and nonverbal communication. This theory is concerned with the links between "language, context and identity". It focuses on both the intergroup and interpersonal factors that lead to accommodation as well as the ways in which power, macro and micro-context concerns affect communication behaviors (Gregory Jr. & Webster, 1996). There are two main accommodation processes described by this theory. "Convergence" refers to the strategies through which individuals adapt to each other's communicative behaviors, in order to reduce these social differences. Meanwhile, "divergence" refers to the instances in which individuals accentuate the speech and non-verbal differences between themselves and their interlocutors (Gregory Jr. & Webster, 1996).

CAT evolved from the speech accommodation theory (SAT), but can be traced back to Giles' accent mobility model of 1973. The speech accommodation theory was developed in order to demonstrate the value of social psychological concepts to understanding the dynamics of speech. It sought to explain "the motivations underlying certain shifts in people's speech styles during social encounters and some of the social consequences arising from them". Particularly, it focused on the cognitive and affective processes underlying individuals' convergence and divergence through speech. The communication accommodation theory has broadened this theory to include not only speech but also the "non-verbal and discursive dimensions of social interaction". Thus, it now encompasses other aspects of communication. In addition, CAT has moved in a more interdisciplinary direction than the previous speech accommodation theory. It now also covers a wider range of phenomena (Gregory Jr. & Webster, 1996).

A broadly heuristic theory, CAT sets out to 'describe and explain aspects of the way people modify their communication according to situational, personal, or even interactional variables.' More significantly, the model provides a framework through which changes in communicative behaviour might be considered in relation to certain psychological processes that either diminish or exacerbate the differences between interlocutors (Ryder & Garagounis, 2014). Two descriptors 'reference' these polarities: processes of convergence, and processes of divergence of significance to the doctor-patient relationship, especially in its crucial early phase, when a speaker aims to improve the quality of interaction, in a process called 'communicative tuning', he or she will select communication strategies that attend to and/or anticipate the communication needs and characteristics of another. This may involve using plain language (as opposed to jargon), offering affiliative non-verbal cues, asking open questions, and mimicking the body

language and speech behaviour of the other party. While the latter may sound potentially offensive, when people converse it is surprisingly common for them to mimic each other's speech. This is done almost intuitively, but in a muted, reciprocal way. Under these circumstances, such mimicking is interpreted as mutually sympathetic interaction and a sign of symmetrical communication (Ryder & Garagounis, 2014).

Communication accommodation theory is useful in this study as it aids in understanding how doctors can provide satisfactory care to patients through the ability to be not only a provider but also an active listener. CAT is a model for understanding the way two people interact with each other and revolves around the principle that their interaction is fundamentally transactional in nature. People are thought to make behavioral adjustments to manage their levels of social distance when interacting with others, and CAT provides a theoretical basis to forecast and account for such adjustments. One of the strategies comprising CAT is approximation, which involves convergence and divergence defined as whether individuals are adjusting their behaviors to match or differentiate their speech and nonverbal communication to another's style. The CAT model has previously been used to investigate physician-patient communication and interaction: adapted as a method for understanding the role that nurturing communication plays during interpersonal interactions among health professionals and patients and used as a mechanism to explore intergroup communication between hospital doctors and the implications it has on levels of patient care (Mickel, McGuire & Gross-Gray, 2013). CAT is a theory that describes the psychologic, social, and linguistic behaviors that people exhibit when communicating with each other. According to this theory, communication between two people can at any time be adjusted by either party in response to actual, perceived, or stereotyped expectations of the other person. This theory has potential in examining the patient-practitioner dyad to understand how ambulatory medical visit conversations function and where communication interventions may be useful to improve patient outcomes. One premise of CAT is that a defining characteristic of social groups is a common set of social and language behaviors. When members from different groups try to communicate they must find a way to adjust to each other's different communication styles and abilities. The strategies that people use to adjust their communication include approximation, interpretability, interpersonal control, and discourse management. The two strategies to focus on in the study, interpersonal control and discourse management, are psychologic elements of communication that are evident in the flow of communication between practitioners and patients and are more readily examined in written transcripts than the other two strategies.

Practitioner communication content and styles similar to CAT approximation and interpretability strategies have been previously examined, but not simultaneously with the patient's role in the communication encounters. For example, if a practitioner believes that older adults are typically hard of hearing and are naïve of medical terminology they may alter their volume and choice of words to attempt to accommodate the older adult listener. Although this approach might be helpful and well received by some older adults, others may find this speech pattern condescending. The older adult may also alter own speech behaviors to decrease the risk of seeming too demanding in an attempt to please the practitioner whom they may see as an authority figure. These preconceived ideas and biases are fraught with danger in a medical visit setting, because they may get in the way of therapeutic relationships and prevent the exchange of important information from both the practitioner and the patient (Hehl & McDonald, 2014). In

CAT, one's statements are viewed in the context of their partner's statements. This contextual view allows one's statements to be classified as either converging to or diverging from the partner's statements. Acts of convergence and divergence influence the patient-physician relationship, because converging statements signify a desire to gain approval, affiliate, establish rapport, and communicate meaning effectively, whereas diverging statements aim to separate, exert control, and generally downplay the statements of the partner. It takes listening aligned toward understanding, not just the collection of factual data. And it takes raising one's awareness to clues - nonverbal signals, fleeting glimpses of emotion, and key words (Haidet, 2007).

3.0. METHODOLOGY

3.1. Study population

The target population comprised of all persons with diabetes mellitus. The accessible population involved both the female and male patients with diabetes mellitus aged 18 years and over who had been attending Kenyatta National Hospital (KNH) and MP Shah Hospital outpatient diabetic clinics for twelve (12) month and over and healthcare providers attending to patients with diabetes mellitus at KNH and MP Shah Hospital outpatient diabetic clinics. The register for diabetes mellitus patients who attended the diabetic clinics at KNH and MP Shah Hospital was used to help in sampling. Systematic random sampling was used to sample the patients. The sample was from the total number of patients that made up the clinic attendance register for the given period of sampling. Kenyatta National Hospital was allocated 313 and MP Shah Hospital 87 and all to make the total of 400 respondents.

3.2. Sampling Frame

The patient register for diabetes mellitus patients who attended the diabetic clinics at Kenyatta national hospital and MP Shah Hospital was used. The sampling frame is as depicted in table 1 below.

Table 1: Healthcare providers / patients at the diabetes mellitus clinics, KNH / MP Shah Hospital

	Kenyatta National Hospital	Mp Shah Hospital	Total
Patients	313	87	**400**

Source: Kenyatta National Hospital/ MP Shah Hospital Diabetic Clinics

3.3. Sample and Sampling Technique

3.3.1. Sample

The sample size was determined according to this formula:

(i) $$n = \frac{Z^2 \, p \, q}{d^2}$$

Since there were no estimates available of the proportion in the target population assumed to have the characteristic of interest, 50% was used as recommended fisher et al. (Mugenda & Mugenda, 1999). Therefore, since the target population with the characteristic is 0.50, the z-statistic is 1.96, and the desired accuracy is at the 0.05 level, the sample size would be:

If, Z – 1.96 P – 0.50 q - 0.50 d – 0.05

Then, $n = \frac{(1.96)2\ (0.050)\ (0.50)}{(0.05)2}$

n= 384

Given that a study on communication was done at Moi Referral and Teaching Hospital (MTRH), Eldoret, to describe perceived physician communication behaviors and its association with adherence to care among HIV patients in Kenya, whereby a convenient sample of 400 HIV adult patients, attending three Academic Model Providing Healthcare program (AMPATH) clinics in Eldoret, Kenya was surveyed between July and August 2011(Wachira, Middlestadt, Reece, Peng & Braitstein, 2014), the present study did in regard to the calculated sample size above and to cater for any drop outs peg its sample to 400 participants.

3.3.2. Sample technique

This was by systematic random sampling, whereby the patients were picked as follows. The sample was from the total number of patients that made up the clinic attendance register for the given period of sampling and from this as per required sample size, the total number of patients was divided by the calculated sample size and hence every n^{th} Patient would then be sampled to make up the sample. The accessible population who were all the patients attending the outpatient diabetic clinic at K.N.H in a year was approximately 3726 (main clinic, done on Fridays only) and 5797(mini clinic, that runs on a daily basis). These were patient consultations as patients seen in the main clinic can end up being seen in the minor clinic on any other day of the week throughout the year. Therefore, there is repetition at the minor clinic. As such the figure of the main clinic (3726), as advised by the Kenyatta diabetes clinic was used as the accessible population from whom the participants were sampled. These figures were according to diabetic clinic attendance of January to December 2015. Too, all patients, approximately 2954 attending the MP Shah Hospital's diabetic clinic, which operates on a daily basis from Monday to Friday, formed part of the accessible population. This figure was in regard to the diabetic clinic attendance of the year July 2017/ June 2018 whereby there were 1030 new patients and 1924 revisits. Therefore, the figure of new patients (1030) was used since this same patients did come back to be seen as revisits.

To avoid double recruitment, the patient registration numbers were referred to throughout the whole research study exercise. To get the sampling interval, the accessible population of approximately 3726 (main clinic, KNH) and 1030 (MP Shah Hospital) was used, whereby each was divided by allocated proportionate samples of 313 patients' (KNH) and 87 patients' (MP Shah Hospital) of the total 400 to yield a sampling interval of 11.90415335 for KNH and11.83908046 for MP Shah Hospital, approximated to 12 respectively. Hence, every 12^{th}

participant at every research centre was sampled to make up the sample size and was done till the total sample size was achieved. As advised by the diabetic clinics to use the main (new patients) clinics attendance visits in the year, the rationale for the distribution of the respondents between KNH and MP Shah Hospital was in regard to the new visits in the year depicted by the main clinic attendance (new visits in the year) of 3726 at KNH and 1030 as new patients but actually being the first visit in the year at the clinic in MP Shah Hospital. The total volume of patients seen at both clinics, viz, 5797(KNH) and 2954(MP Shah Hospital) included both the new patients and the re-attendances. As such the new visits numbers was used to calculate the respective allocations of the sample size to each study area as follows. Since the total number of the main clinic (new) attendance for both study areas is 3726 + 1030= 4756 in a year which corresponded to the sample of 400 participants; to get the proportionate sample for each of the study area, the computations below was of essence:

Thus,

If, 4756 patients corresponded to 400 participants; then, 3726(KNH) would correspond to; 3726 multiplied by 400 divided by 4756 = 313.372582 rounded off to 313, and 1030 (MP Shah Hospital) would correspond to 1030 multiplied by 400 divide by 4756 =86.627418 rounded off to 87. Therefore, KNH would be allocated 313 and MP Shah Hospital 87 and all to make the total of 400 respondents.

3.4. Data collection Instrument

To collect data, the researcher used a researcher administered questionnaire for patients**.** It did seek information on their sociodemographic data; healthcare provider patient communication and diabetes mellitus management practices.

3.5. Research Design

This was a causal comparative research design study, with application of quantitative methodology. Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques and focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon/research design that seeks to find relationships between independent and dependent variables after an action or event has already occurred, by comparing two or more groups of individuals (Babbie, 2010; Muijs, 2010; Salkind, 2010). Ex post facto research is a method that can also be used instead of an experiment, to test hypotheses about cause and effect in situations where it is unethical to control or manipulate the dependent variable (Cohen, Manion & Morrison, 2007). The design seeks to establish causal relationships between events and circumstances, to find out the cause of certain occurrences or non-occurrences. This is achieved by comparing the circumstances associated with observed effects and by noting the factors present in the instances where a given effect occurs and where it does not occur. Attempts are made to explain the consequences based on the antecedent conditions; determine the influence of a variable on another, and test a claim using statistical hypothesis testing techniques (Lord, 1973). Researchers can report only what has happened or what is happening, by trying to hold factors constant by careful attention to the sampling. The relationship between the independent variable and dependent variable is usually a suggested relationship because the researcher does

not have complete control over the independent variable. As in the current study, the independent variable, healthcare provider patient communication had already occurred and its effect on the dependent variable, diabetes management practices had already taken place in the sample groups being studied. The groups though in healthcare settings differ by belonging either to a public or private healthcare setting; hence such circumstances could bear varying effects on them in regard to the study outcome.

3.6. Data Collection Procedure

The study was carried out at two sites; Kenyatta National Hospital, a public hospital and MP Shah Hospital, a private hospital. Data from these two sites was collected separately. At KNH, the researcher would visit on Fridays of every week when the main clinic is conducted to collect data. But since the registers and patient files are prepared a day prior to the actual clinic day, the researcher would visit the clinic a day prior, that is on Thursdays of every week to sample the participants to be recruited into the study as the clinic registers for patients were used for the purpose. At MP Shah Hospital, the researcher would visit the clinic daily from Monday to Thursday as clinic days are conducted daily from Monday to Friday.

The recruitment of participants was done a week prior to the next week or the day prior to the next day at MP Shah Hospital, since according to the clinic, the registers and patient files are prepared a week/day prior, though booking of the patients for the specific clinic days would have been done at the previous clinic visit when they were attended to. Two research assistants were involved, with one of them coming daily from Monday to Friday and the other joining in on Thursdays and Fridays because of the MP Shah Hospital clinic on Friday since the clinic at KNH was conducted on the same day. Since the researcher had two research assistants, they would assist in the recruitment of the participants by visiting the sites together with the researcher except on Fridays when one research assistant would visit MP Shah Hospital to identify and physically recruit the participants by talking to them and agree with them on when they could meet the researcher to be taken through data collection within the next week. This whole process would be done by the researcher and his assistants helped by the staff at the clinic. The assistants and the staff did undergo some training in regard to the study requirements. Once identified and recruited, consent was sought from the participants.

To ensure that there was no double participant recruitment, the clinic attendance registers and patient record files were used and therefore the outpatient registration numbers of the patients noted at all times throughout the sampling and data collection. Since the clinics began at 8a.m and ended at 5p.m; and since the registers were used to identify the participants, recruitment began immediately the patients arrived and as they waited to be attended to by the healthcare providers, and if they had already been attended to, they would continue with the process, though they would also be allowed to collect the prescribed drugs or go for any tests or investigations or medical procedures requested for by the healthcare providers. The data collection instruments and data collected for KNH and MP Shah Hospital was kept separately.

Consenting was done by the researcher, by first explaining to the participant about the nature of the research and why it is being done by taking them through the consent explanation form contents and any questions raised would be answered. The selection process of the participant would be explained to him or her so that he/she understood as to why he/she had been selected. Once this was done and he or she agreed to participate, the informed consent form would be

provided to the participant to sign in the presence of the researcher and once signed he/she was recruited into the study. Those who declined to participate were not recruited into the study. Data collection would then commence afterwards. In all this the researcher was assisted by his research assistants.

Data collection was done by the researcher only and this upon the participant consenting. The participants would be taken through the questionnaires. This took about 30 to 45 minutes to complete the questionnaire. Once data had been collected, the participant would be informed of the end of the exercise and how the information they had given was useful in the study. The researcher would thank the participant for agreeing and participating in the study. They would be informed of the confidentiality of their participation, the information they had given and the safe keeping of the research instrument. Once data had been collected, it was kept safely in a locker only accessible to

3.7. Data Analysis

Statistical analysis was then done after data was posted by a computer data base developed using statistical package for social sciences (SPSS) in version 23.0. The results were presented in descriptive and inferential form. Patient characteristics were summarized using percentages and means or medians for categorical and continuous data respectively. Comparisons were done between private and public hospital patients using chi square test of association for categorical variables and independent t-test for comparison of means.

Healthcare provider patient communication rating were scored and calculated as overall mean scores for nonverbal communicative behaviour. Healthcare provider patient communication rating between the hospitals was compared using independent t-test. Similarly, diabetes mellitus management practices scores were summarized into means and compared between the two hospitals. Linear regression (simple linear regression and multiple linear regression model 1) as follows was used to test the relationship between healthcare provider patient communication ratings and diabetes management practices scores. Test of significance was done at a significant level of 0.05 at 95% confidence interval to test hypotheses.

3.7.1. Simple linear regression

This was by the following formula:

$$\boldsymbol{y = \beta_0 + \beta_1 x_1}$$

Where,

y – The dependent variable – diabetes mellitus management practices score

x – Independent variable (nonverbal communicative behaviour score)

3.7.2. Multiple linear regression model 1

The regression model was developed using the following formula:

$$\boldsymbol{y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4}$$

Where:

y – The dependent variable – diabetes mellitus management practices score

x – Independent variables 1, 2, 3 and 4 (verbal language score, nonverbal communicative behaviour score, noise score and environmental context score)

4.0. RESULTS AND DISCUSSION

4.1. RESULTS

4.1.1. Response Rate

Table 2: Distribution of Study Participants (Patients at Diabetes Mellitus Clinics, Kenyatta National Hospital / MP Shah Hospital)

	Kenyatta National Hospital			MP Shah Hospital			Total		
	Target	Actual	Response rate (%)	Target	Actual	Response rate (%)	Target	Actual	Response rate (%)
Patients No.	313	313	**100**	87	87	**100**	400	400	**100**

Source: Field Data (2019)

A total of 400 participants, patients with diabetes mellitus aged 18 years and above at the diabetes and endocrinology Centre's of both Kenyatta National Hospital and MP Shah Hospital were involved in the study as is depicted in table 2. 313 patients at KNH and 87 patients at MP Shah respectively were studied between the months of February 2019 and November 2019. Overall, there were 166 (41.5%) male and 234 (58.5%) female patients. A response rate of 100% was achieved overall as well as at KNH and MP Shah Hospital. 400 questionnaires were sufficiently completed. This high response rate at both study centers was achieved as a result of the researcher being involved at every stage of data collection from the time of issuing to collection of the questionnaires.

4.1.2. Socio Demographic Characteristics

Table 3: Socio demographic characteristics of patients at Kenyatta National Hospital

Variable	Overall (n=313) n (%)	Male (n=123) n %	Female (n=190) n %	P value
Gender		-	-	-
Male	123 (39.3)			
Female	190 (60.7)			
Age				
Mean (SD)	59.3 (14.0)	61.2 (14.4)	58.1 (13.7)	0.053
Min – Max	18 – 92	22-92	18-86	
Age groups				
18-27	6 (1.9)	4 (3.3)	2 (1.1)	**0.047**
28-37	12 (3.8)	2 (1.6)	10 (5.3)	
38-47	41 (13.1)	9 (7.3)	32 (16.8)	
48-57	71 (22.7)	29 (23.6)	42 (22.1)	
58-67	83 (26.5)	35 (28.5)	48 (25.3)	
>67	100 (31.9)	44 (35.8)	56 (29.5)	

Marital status				
Single	36 (11.5)	8 (6.5)	28 (14.7)	< **0.001**
Married	228 (72.8)	113 (91.9)	115 (60.5)	
Separated	3 (1.0)	0	3 (1.6)	
Divorced	3 (1.0)	0	3 (1.6)	
Widowed	43 (13.7)	2 (1.6)	41 (21.6)	
Highest level of education				
None	22 (7.0)	5 (4.1)	17 (8.9)	**0.010**
Primary	116 (37.1)	37 (30.1)	79 (41.6)	
Secondary	116 (37.1)	55 (44.7)	61 (32.1)	
College	40 (12.8)	14 (11.4)	26 (13.7)	
University	19 (6.1)	12 (9.8)	7 (3.7)	
Occupation				
Professional	76 (24.5)	34 (27.6)	42 (22.5)	< **0.001**
Business personnel	118 (38.0)	44 (39.9)	75 (39.6)	
Technical personnel	19 (6.1)	15 (12.2)	4 (2.1)	
Skilled personnel	38 (12.3)	24 (19.5)	14 (7.5)	
Unskilled personnel	55 (17.7)	6 (4.9)	49 (26.2)	
Learner	4 (1.3)	0	4 (2.1)	
Religion				
Catholic	100 (31.9)	41 (33.3)	59 (31.1)	0.581
Protestant	201 (64.2)	79 (64.2)	122 (64.2)	
Muslim	5 (1.6)	2 (1.6)	3 (1.6)	
Other	7 (2.2)	1 (0.8)	6 (3.2)	

Source: Field Data (2019)

As in table 3, three hundred and thirteen (313) diabetic patients with a mean age of 59.3 years (SD 14 years) were studied at KNH. There were 190 (60.7%) females with a mean age of 58.1years (SD13.7) and 123(39.3%) males with a mean age of 61.2 years (SD14.4), hence males being insignificantly older than females, p=0.053. The youngest patient was 18 years and the oldest 92 years old. In regard to males the youngest was 22 years and the oldest was 92years and for females the youngest was 18 years and the oldest 86 years. The majority of patients in age group distribution were 67years and above (100 (31.9%)) with more females (56 (29.5%)) than the males (44 (35.8%)). This was followed by those in the age group 58-67 years with more females (48 (25.3%)) than the males (35 (28.5%)). Except for the 18-27 year age group where male patients were significantly more than the female patients, there were significantly more female than male patients in the other age group distribution, p=0.047. Majority of the patients were married (72.8%) being significantly higher in males (91.9%) than in females (60.5%), p<0.001. Overall, the highest level of education was mainly primary (37.1%) and secondary (37.1%) with significantly more males compared to females having secondary and university level of education, p=0.010. On the other hand significantly more females reported primary level, college level and no education than males, p=0.010. Occupation was mainly of professional work (24.5%) and business (38%). As regards professionals, business personnel, unskilled personnel and learners there were significantly more females than males and vice versa for the technical personnel and skilled personnel differences, p< 0.001. In regard to religion, the majority of the patients were of Catholic (31.9%) and Protestant (64.2%) denominations with the female patients insignificantly more in each category than the male patients.

Table 4: Socio demographic characteristics for patients at MP Shah Hospital

Variable	Overall (n=87) n (%)	Male (43) n %	Female (44) n %	P value
Gender				
Male	43 (49.4)	-	-	-
Female	44 (50.6)			
Age				
Mean (SD)	55.5 (10.0)	57.5 (6.9)	53.5 (12.0)	0.061
Min – Max	19.0 – 79.0	34-72	19-79	
Age groups				
18-27	1 (1.1)	0	1 (2.3)	0.188
28-37	5 (5.7)	1 (2.3)	4 (9.1)	
38-47	5 (5.7)	1 (2.3)	4 (9.1)	
48-57	38 (43.7)	18 (41.9)	20 (45.5)	
58-67	31 (35.6)	20 (46.5)	11 (25.0)	
>67	7 (8.0)	3 (7.0)	4 (9.1)	
Marital status				
Single	10 (11.5)	0	10 (22.7)	**0.008**
Married	72 (82.8)	41 (95.3)	31 (70.5)	
Separated	1 (1.1)	0	1 (2.3)	
Divorced	1 (1.1)	1 (2.3)	0	
Widowed	3 (3.4)	1 (2.3)	2 (4.5)	
Highest level of education				
Primary	4 (4.6)	1 (2.3)	3 (6.8)	0.137
Secondary	10 (11.5)	4 (9.3)	6 (13.6)	
College	23 (26.4)	8 (18.6)	15 (34.1)	
University	50 (57.5)	30 (69.8)	20 (45.5)	
Occupation				
Professional	60 (71.4)	35 (85.4)	25 (58.1)	0.114
Business personnel	15 (17.9)	4 (9.8)	11 (25.6)	
Technical personnel	2 (2.4)	1 (2.4)	1 (2.3)	
Skilled personnel	4 (4.8)	1 (2.4)	3 (7.0)	
Unskilled personnel	2 (2.4)	0	2 (4.7)	
Learner	1 (1.2)	0	1 (2.3)	
Religion				
Catholic	22 (25.6)	9 (21.4)	13 (29.5)	0.109
Protestant	52 (60.5)	26 (61.9)	26 (59.1)	
Muslim	5 (5.8)	1 (2.4)	4 (9.1)	
Other	7 (8.1)	6 (14.3)	1 (2.3)	

Source: Field Data (2019)

At MP Shah as in table 4, 87 diabetic patients with a mean age of 55.5 years (SD 10 years) were studied; 50.6% were females and 49.4% males. Males were insignificantly older (mean age, 57.5 years) than females (mean age, 53.5 years), p=0.061. The youngest male was 34years with the oldest being 72years while for the females, the youngest was 19 years and the oldest 79 years. In the age group distribution, the majority of patients were in the age group of 48-57 years, 38(43.7%) followed by those in the age group of 58-67 years, 31(35.6%).

The majority of the males were in the age group of 58-67 years, 20 (46.5%), followed with the ones in age group 48-57 years,18 (41.9%). Majority of the females were in the age group of 48-57 years, 20 (45.5%), followed with the ones in the age group 58-67 years, 11(25%). No significant difference was noted by genders in the age group distributions.

Majority of the patients were married and divorced which was significantly higher in males than females and vice versa for those who were single, separated and widowed p=0.008. Highest level of education was university education (57.5%) and the lowest was primary education (4%). Occupation of the patients was mainly professional work (71.4%). On religion, the majority of patients were of catholic (25.6%) and protestant (60.5) denominations. There were no significant differences between male and female patients in all categories of occupation and religion.

Table 5: Comparison of socio demographic characteristics between patients at Kenyatta National Hospital and MP Shah Hospital

Variable	KNH (n=313)	MP Shah (n=87)	P value
Gender			
Male	123 (39.3)	43 (49.4)	0.090
Female	190 (60.7)	44 (50.6)	
Age, mean (SD)	59.3 (14.0)	55.5 (10.0)	**< 0.001**
Category, n (%)			
18-27	6 (1.9)	1 (1.1)	**0.009**
28-37	12 (3.8)	5 (5.7)	
38-47	41 (13.1)	5 (5.7)	
48-57	71 (22.7)	38 (43.7)	
58-67	83 (26.5)	31 (35.6)	
>67	100 (31.9)	7 (8.0)	
Marital status			
Single	36 (11.5)	10 (11.5)	**0.050**
Married	228 (72.8)	72 (82.8)	
Separated	3 (1.0)	1 (1.1)	
Divorced	3 (1.0)	1 (1.1)	
Widowed	43 (13.7)	3 (3.4)	
Highest Level of Education			
None	22 (7.0)	0	**< 0.001**
Primary	116 (37.1)	4 (4.6)	
Secondary	116 (37.1)	10 (11.5)	
College	40 (12.8)	23 (26.4)	
University	19 (6.1)	50 (57.5)	
Occupation			
Professional	76 (24.5)	60 (71.4)	**< 0.001**
Business personnel	117 (38.0)	15 (17.9)	
Technical personnel	19 (6.1)	2 (2.4)	
Skilled personnel	38 (12.3)	4 (4.8)	
Unskilled personnel	55 (17.7)	2 (2.4)	
Lerner	4 (1.3)	1 (1.2)	
Religion			
Catholic	100 (31.9)	22 (25.6)	**0.008**
Protestant	201 (64.2)	52 (60.5)	
Muslim	5 (1.6)	5 (5.8)	
Other	7 (2.2)	7 (8.1)	

Source: Field Data (2019)

Gender distribution among patients was not significantly different between KNH and MP Shah Hospital, p=0.090 as in table 5. On age, the patients at KNH were significantly older as compared to patients at MP Shah Hospital with an average age of 59.3 years as compared to 55.5 years respectively (p<0.001). There were significantly more patients in the 18-27, 38-47 and > 67 years age group distribution at KNH than MP Shah Hospital and vice versa in the age groups of 28-37, 48-57 and 58-67years, p=0.009. Though with no significant difference in gender distribution between the two hospitals, there were more male patients in percentage ratio at MP Shah Hospital (49.4%) than those at KNH (39.3%). The female patients were more in percentage ratio at KNH of 60.7% as compared to 50.6% female patients at MP Shah Hospital. On the other sociodemographic characteristics, a higher proportion of patients were married at MP Shah Hospital than KNH, while those who were widowed were more at KNH (p=0.050). Education level was significantly higher among patients at MP Shah Hospital than at KNH (p<0.001) and they were more likely to be in professional work (p<0.001). Similarly, there were significantly higher proportions of Muslims and other religions at MP Shah Hospital than at Kenyatta National Hospital (p=0.008) and vice versa for the catholic and protestant religious domination.

4.1.3. Healthcare Provider Patient Nonverbal Communicative Behaviour (NVCB) on Diabetes Mellitus Management Practices

Table 6: Healthcare provider patient nonverbal communicative behaviour at Kenyatta National Hospital

Variable	Overall (n=313) Mean (SD)	Male (n=123) Mean (SD)	Female (n=190) Mean (SD)	P value
The healthcare providers are usually in a hurry when providing medical care or treatment and do not spend enough of time with me.	4.4 (0.7)	4.4 (0.7)	4.4 (0.7)	0.541
The body language of the healthcare providers communicated caring and concern.	4.3 (0.6)	4.3 (0.6)	4.3 (0.6)	0.862
The healthcare providers sat in an appropriate manner and physical distance in relation to me during our interaction.	4.3 (0.6)	4.3 (0.6)	4.3 (0.6)	0.977
I was encouraged and comfortable by the way the healthcare providers were sitting/standing in regard to body posture while attending to me.	4.3 (0.6)	4.3 (0.6)	4.3 (0.6)	0.916
The healthcare providers looked at me, did not seem distracted, attended to my physical comfort, had genuine interest in me as a person, and listened patiently and carefully to what I had to say.	4.4 (0.6)	4.4 (0.6)	4.4 (0.6)	0.695
The healthcare providers kept quiet for reasonable amount of time to listen to what I said during our interactions.	4.4 (0.7)	4.4 (0.7)	4.4 (0.7)	0.975
The healthcare provider maintained appropriate gaze from the way they looked at me during our interaction.	4.4 (0.6)	4.4 (0.6)	4.4 (0.6)	0.530
The touch by the healthcare provider was appropriate whenever I was examined and did seek my permission first.	4.5 (0.7)	4.3 (0.7)	4.3 (0.7)	0.427
The healthcare providers' face expressions encouraged me to keep talking about my disease condition.	4.4 (0.6)	4.3 (0.6)	4.4 (0.6)	0.670
The healthcare providers' spoke in a voice that showed patience and calmness while attending to me.	4.3 (0.6)	4.3 (0.6)	4.3 (0.6)	0.873
The general body, hand and head movements by the healthcare providers while attending to me were appropriate during our interactions.	4.3 (0.6)	4.3 (0.6)	4.3 (0.6)	0.648
I had to wait for too long from the time I got to the clinic to be attended to by the healthcare providers.	3.4 (1.2)	3.6 (1.2)	3.2 (1.3)	**0.014**
Overall score on Nonverbal communicative behavior	**81.6 (12.8)**	**82.0 (13.0)**	**81.3 (12.7)**	**0.639**

Source: Field Data (2019)

As shown in table 6, patients at KNH rated healthcare providers highly in terms of nonverbal communicative behavior with an overall mean score rating of 81.6 (SD 12.8). There was a higher rating by the male patients (mean, 82.0 (SD 13.0)) than that by the female patient (mean, 81.3 (SD 12.7)) but with no significant difference by gender. The score rating was high across all the twelve (12) facets by more than a mean score of 4.0 except on aspect; patients had to wait for too long from the time they got to the clinic to be attended to by the healthcare providers with an overall mean score rating of 3.4 (SD 1.2). Ratings by gender revealed similar mean scores by

both the male and female patients across in all the facets on NVCB with no significant difference except on waiting time before the patients were attended to in which there was significantly higher score rating by the male patient gender (mean, 3.6 (1.2)) as compared to that by the female patient gender (mean, 3.2 (1.3)), p=0.014.

Table 7: Healthcare provider patient nonverbal communicative behaviour at MP Shah Hospital

Variable	Overall (n=87) Mean (SD)	Male (n=43) Mean (SD)	Female (n=44) Mean (SD)	P value
The healthcare providers are usually in a hurry when providing medical care or treatment and do not spend enough of time with me.	4.5 (0.6)	4.5 (0.6)	4.6 (0.6)	0.515
The body language of the healthcare providers communicated caring and concern.	4.5 (0.6)	4.4 (0.6)	4.6 (0.6)	0.123
The healthcare providers sat in an appropriate manner and physical distance in relation to me during our interaction.	4.5 (0.6)	4.4 (0.7)	4.6 (0.5)	0.083
I was encouraged and comfortable by the way the healthcare providers were sitting/standing in regard to body posture while attending to me.	4.5 (0.6)	4.4 (0.6)	4.6 (0.5)	**0.047**
The healthcare providers looked at me, did not seem distracted, attended to my physical comfort, had genuine interest in me as a person, and listened patiently and carefully to what I had to say.	4.7 (0.6)	4.6 (0.6)	4.8 (0.5)	0.160
The healthcare providers kept quiet for reasonable amount of time to listen to what I said during our interactions.	4.4 (0.7)	4.3 (0.8)	4.6 (0.5)	**0.034**
The healthcare provider maintained appropriate gaze from the way they looked at me during our interaction.	4.6 (0.5)	4.5 (0.6)	4.6 (0.5)	0.385
The touch by the healthcare provider was appropriate whenever I was examined and did seek my permission first.	4.3 (0.8)	4.2 (0.8)	4.3 (0.9)	0.548
The healthcare providers' face expressions encouraged me to keep talking about my disease condition.	4.5 (0.5)	4.5 (0.5)	4.5 (0.5)	0.768
The healthcare providers' spoke in a voice that showed patience and calmness while attending to me.	4.5 (0.5)	4.5 (0.5)	4.6 (0.5)	0.481
The general body, hand and head movements by the healthcare providers while attending to me were appropriate during our interactions.	4.4 (0.7)	4.3 (0.6)	4.5 (0.8)	0.327
I had to wait for too long from the time I got to the clinic to be attended to by the healthcare providers.	3.6 (1.1)	3.8 (1.1)	3.5 (1.1)	0.273
Overall score on Nonverbal communicative behavior	**85.5 (11.1)**	**84.0 (11.6)**	**87.0 (10.6)**	**0.216**

Source: Field Data (2019)

At MP Shah Hospital as in table 7, overall, nonverbal communicative behavior was rated highly (mean, 85.5 (SD 11.1)) with the rating by the female patients (mean, 87.0 (10.6)) higher than that of the male patients (mean, 84.0 (11.6)) but with no significant difference by gender. The rating was high across all the facets with more than mean scores of 4.0 except on when patients had to wait for too long from the time they got to the clinic to be attended to by the healthcare providers, (mean, 3.6 (SD 1.1)) and reflected in patients' gender though with a slightly higher rating by male patients (mean, 3.8 (1.1)) than that by the female patients (mean, 3.5 (1.1)) with no significant difference by gender (p=0.273). The score ratings by the female patients were higher in almost all areas of NVCB than for the male patients except on communication areas where the healthcare providers' face expressions (facial expressions) encouraged the patients to keep talking about their disease condition in which there was a similar mean score for both

genders (mean, 4.5 (SD 0.5)) and on waiting time before the patients were attended to as already described above.

There was no significant difference between the female and male patients' scores across the facets in NVCB except on area whereby the patients were encouraged and were comfortable by the way the healthcare providers were sitting/standing while attending to them as regards body posture where there was significantly higher score rating by the female patients (mean 4.6 (SD 0.5)) than by male patients (mean 4.4 (SD 0.6)), p=0.047 and also in the area in which the healthcare providers kept quiet for reasonable amount of time to listen to what the patients said during their interactions in account to silence which was significantly higher by the female patients (mean 4.6 (SD 0.5)) as compared to the male patients (mean4.3 (SD 0.7)), p =0.034.

Table 8: Comparison of healthcare provider patient nonverbal communicative behaviour between Kenyatta National Hospital and MP Shah Hospital

Variable	KNH (n=313) Mean (SD)	MP Shah (n=87) Mean (SD)	P value
The healthcare providers are usually in a hurry when providing medical care or treatment and do not spend enough of time with me.	4.4 (0.7)	4.5 (0.6)	0.073
The body language of the healthcare providers communicated caring and concern.	4.3 (0.6)	4.5 (0.6)	< **0.001**
The healthcare providers sat in an appropriate manner and physical distance in relation to me during our interaction.	4.3 (0.6)	4.5 (0.6)	**0.004**
I was encouraged and comfortable by the way the healthcare providers were sitting/standing in regard to body posture while attending to me.	4.3 (0.6)	4.5 (0.6)	**0.018**
The healthcare providers looked at me, did not seem distracted, attended to my physical comfort, had genuine interest in me as a person, and listened patiently and carefully to what I had to say.	4.4 (0.6)	4.7 (0.6)	< **0.001**
The healthcare providers kept quiet for reasonable amount of time to listen to what I said during our interactions.	4.4 (0.7)	4.4 (0.7)	0.586
The healthcare provider maintained appropriate gaze from the way they looked at me during our interaction.	4.4 (0.6)	4.6 (0.5)	0.053
The touch by the healthcare provider was appropriate whenever I was examined and did seek my permission first.	4.5 (0.7)	4.3 (0.8)	0.941
The healthcare providers' face expressions encouraged me to keep talking about my disease condition.	4.4 (0.6)	4.5 (0.5)	0.068
The healthcare providers' spoke in a voice that showed patience and calmness while attending to me.	4.3 (0.6)	4.5 (0.5)	**0.008**
The general body, hand and head movements by the healthcare providers while attending to me were appropriate during our interactions.	4.3 (0.6)	4.4 (0.7)	0.401
I had to wait for too long from the time I got to the clinic to be attended to by the healthcare providers.	3.4 (1.2)	3.6 (1.1)	0.061
Overall score on Non-verbal communicative behavior	**81.6 (12.8)**	**85.5 (11.1)**	**0.010**

Source: Field Data (2019)

In making comparisons between the two hospitals as shown in table 8, the overall mean scores for nonverbal communicative behavior was significantly higher at MP Shah Hospital (mean, 85.5 (11.1)) than at KNH (mean, 81.6 (12.8)) (p=0.010). Also significantly higher scores were computed at MP Shah Hospital than at KNH in regard to the following areas: the body language of the healthcare providers communicated caring and concern (p=0.001); the healthcare providers sat in an appropriate manner and physical distance in relation to me during our interaction as regards proximity (p=0.004); the patients were encouraged and comfortable by the

way the healthcare providers were sitting/standing while attending to them as regards body posture (p=0.018); the healthcare providers looked at the patients, did not seem distracted, attended to patients physical comfort, had genuine interest in patients as a person, and listened patiently and carefully to what the patients had to say as concerns attention (p=0.001) and the healthcare providers' spoke in a voice that showed patience and calmness while attending to patients in relation to tone of voice (p=0.008) as compared to those of KNH.

Regarding waiting time before being attended to as one of the aspect in nonverbal communicative behaviour, the mean scores computed in comparing the KNH and MP Shah Hospital were generally low. Though the case, the rating by patients was higher at MP Shah Hospital (mean 3.6 (SD1.1)) than at KNH (mean 3.4 (SD1.2)) with no significance difference. In addition, the ratings by patients at MP Shah hospital were higher in almost all areas of NVCB except when patients reported that the touch by the healthcare provider was appropriate whenever they were examined and did seek patients permission first which was rated higher by KHN patients (mean, 4.5 (0.7)) than as by the MP Shah hospital patients (mean, 4.3 (0.8)). On the aspect that the healthcare providers kept quiet for reasonable amount of time to listen to what the patients said during their interactions in reference to silence, the score ratings, were the same by both the KNH and MP Shah Hospital patients (mean score,4.4 (0.7)).

4.1.4. Testing for Association

The relationship between nonverbal communicative behaviour and diabetes mellitus management practices was analysed to find out the correlations and how significant the association was between the independent and dependent variables. Correlation was first done in regard to all the patient participants of the study sample and then at the two separate hospitals to get the outcome at each of them. This was by simple linear regression and afterwards by multiple linear regression model 1.

4.1.4.1. Simple Linear Regression

Simple linear regression was performed to establish the relationship between nonverbal communicative behaviour and diabetes mellitus management practices as follows. Was the independent variable a predictor of the dependent variable in regard to the correlations / associations outcome between them?

4.1.4.1.1. Correlation between healthcare provider patient communication (HCPPC) and diabetes management practices (DMMPs) in overall

Table 9: Simple linear regression of the correlation between HCPPC and DMMPs in overall

Variable	β (95% CI)	P value
Nonverbal communicative behavior	0.50 (0.39, 0.61)	< **0.001**

N=400

a. Dependent Variable: Diabetes mellitus management practices

Correlation is significant at the 0.05 level (2-tailed).

Source: Field Data (2019)

In table 9, there was significant association and positive correlation between diabetes mellitus management practices and nonverbal communicative behavior (NVCB) [β=0.50, (95% CI 0.39, 0.61), p<0.001]. These findings on association are of the indication that nonverbal communicative behavior not only favourably and positively influenced but also had significantly positive effect on diabetes mellitus management practices among patients during communication with the healthcare providers. A unit increase in NVCB had corresponding increase in DMMPs among the patients. Therefore the IV was independently significant predictors of the response variable.

4.1.4.1.2. Correlation between healthcare provider patient communication (HCPPC) and diabetes management practices (DMMPs) by Hospital

Table 10: Simple linear regression on correlation between HCPPC and DMMPs by Hospital

Variable	KNH		MP Shah	
	β (95% CI)	**P value**	**β (95% CI)**	**P value**
Nonverbal communicative behavior	0.52 (0.40, 0.64)	**< 0.001**	0.45 (0.23, 0.68)	**< 0.001**

N=400

a. Dependent Variable: Diabetes mellitus management practices

Correlation is significant at the 0.05 level (2-tailed).

Source: Field Data (2019)

As appears in table 10, significant association and positive correlation was found among patients in regard to diabetes mellitus management practices and nonverbal communicative behavior, β = 0.52 (0.40, 0.64), < 0.001 at KNH and β = 0.45 (0.23, 0.68), < 0.001 at MP Shah Hospital. This was of indication that a unit increase in NVCB lead to improvement in DMMPs. With most past studies not specific on nonverbal communicative behaviour as a domain, findings by Abdulhadi et al, 2007; Weir, 2012 and Mickel, McGuire & Gross-Gray, 2013 on the patients' satisfaction with the nonverbal behaviours of the healthcare providers during their interactions largely concur with the present study outcome.

4.1.4.2. Multiple Linear Regression Model 1 (Adjusted – Communication Variables)

In this section, the healthcare provider patient communication variables of verbal language use, nonverbal communicative behaviour, noise and environment context as predictors were all considered together in the multiple linear regression model 1 analysis in order to determine their level of influence on diabetes mellitus management practices.

4.1.4.2.1. Correlation between healthcare provider patient communication (HCPPC) and diabetes management practices (DMMPs) in overall

The model was further adjusted for the healthcare provider patient communication variables to determine the independent predictors of DMMPs among patients (model 1) overall. Forward stepwise regression method was used to generate the model. Thus, the independent effect of the predictor variables was brought out in the analysis as follows.

Table 11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.579[a]	0.335	0.328	12.29705

a. Predictors (Constant): verbal language use, nonverbal communicative behaviour, noise, environmental context

Source: Field Data (2019)

From table 11, the value of R was 0.579, an indication that verbal language use, nonverbal communicative behaviour, noise and environment context as predictors had an influence on DMMPs. From these results, 33.5% variations of DMMPs were as a result of the four independent variables. An analysis of variance (ANOVA) was also done to ascertain whether the four independent variables were significant predictors of DMMPs as summarized in table 12 below.

Table 12: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30062.880	4	7515.720	49.701	**0.000**[b]
	Residual	59730.870	395	151.217		
	Total	89793.750	399			

a. Dependent Variable: Diabetes mellitus management practices

b. Predictors: (Constant), verbal language use, nonverbal communicative behaviour, noise, environmental context

Source: Field Data (2019

From the preceding table 12, the ANOVA findings [F (4, 395) =49.701, P<0.05)] of the significance value of p= 0.000 depicted that there existed significant influence of the predictor variables, nay, verbal language use, nonverbal communicative behaviour, noise and environment context on the response variable, nay diabetes mellitus management practices.

Table 13: Multiple regression model 1 (Adjusted communication variables) of the correlation between HCPPC and DMMPs in overall

Variable	β (95% CI)	P value
Nonverbal communicative behavior	0.15 (0.03, 0.27)	**0.016**

Dependent Variable: Diabetes mellitus management practices

Source: Field Data (2019)

From further regression analysis as in table 13 above, overall nonverbal communicative behaviour [β=0.15, (95% CI 0.03, 0.27), p=0.016] was statistically significant on adjustment using stepwise method (model 1). This means nonverbal communicative behaviour had statistically significant positive effect on diabetes mellitus management practices. There was positive improvement in DMMPs as depicted by the regression coefficients with every unit increase in nonverbal communicative behaviour. Though with little data from past studies, the finding on nonverbal communicative behaviour gets support from Khan, Hanif, Tabassum,

Qidwai & Nanji, 2014 study that positive, effective, and sensitive nonverbal behavior helps to strengthen the doctor-patient bond.

4.1.4.2.2. Correlation between healthcare provider patient communication (HCPPC) and diabetes management practices (DMMPs) by Hospital

The model was further adjusted for the healthcare provider patient communication variables to determine the independent predictors of DMMPs among patients (model 1) by hospital. Forward stepwise regression method was used to generate the model. Thus, the independent effect of the predictor variables was brought out in the analysis as follows.

Table 14: Model Summary

	R	R Square	Adjusted R Square	Std Error of the Estimate
MP Shah Hospital	0.483[a]	0.233	0.195	11.39921
KNH	0.603[b]	0.363	0.355	12.52436

a. Predictor: (Constant), verbal language use, nonverbal communicative behaviour, noise, environmental context

Source: Field Data (2019)

From table 14, the value of R was 0.483 for MP Shah hospital an indication that verbal language use, nonverbal communicative behaviour, noise and environment context as predictors had influence on diabetes mellitus management practices and that a 23.3% variation of DMMPs were as a result of the four independent variables. The value of R of 0.603 for KNH revealed that the four independent variables as predictors had influence on DMMPs and hence a 36.3% variation of diabetes mellitus management practices were as a result of independent variables.

An analysis of variance (ANOVA) was done to ascertain whether verbal language use, nonverbal communicative behaviour, noise and environment context were a significant predictor of diabetes mellitus management practices and the results were summarized as in table 15 below.

Table 15: ANOVA[a]

Clinic	Model		Sum of Squares	df	Mean Square	F	Sig.
M.P.Shah Hospital	1	Regression	3234.988	4	808.747	6.224	**0.000**[b]
		Residual	10655.242	82	129.942		
		Total	13890.230	86			
KNH	1	Regression	27590.145	4	6897.536	43.973	**0.000**[c]
		Residual	48312.731	308	156.860		
		Total	75902.875	312			

a. Dependent Variable: Diabetes mellitus management practices

b. Predictors: (Constant), verbal language use, nonverbal communicative behaviour, noise, environmental context

Source: Field Data (2019)

In table 15, the ANOVA finding of [F (4, 82) =6.224, p=0.000)] at MP Shah with the significance value of p=0.000 and [F (4,308) =43.973, p=0.000)] at KNH with the significance value of p=0.000. This depicted that there existed significant influence of the predictor variables of verbal language use, nonverbal communicative behaviour, noise and environment context on

the response variable of diabetes mellitus management practices. All the independent variables were then correlated to the dependent variable to determine the predictor variables value on DMMPs overtime and this is summarised in table 16 that follow with the attendant discussions.

Table 16: Multiple regression model 1 (Adjusted- communication variables) on correlation between HCPPC and DMMPs by Hospital

Variable	KNH		MP Shah	
	β (95% CI)	P value	β (95% CI)	P value
Nonverbal communicative behavior	0.20 (0.08, 0.33)	**0.002**	0.03 (0.37, 0.42)	0.899

Dependent Variable: Diabetes mellitus management practices

Source: Field Data (2019)

As in table 16 above, nonverbal communicative behaviour [β=0.20, (95% CI 0.08, 0.33), p=0.002] was statistically significant in relation to DMMPs at KNH and not at MP Shah Hospital. This implies that NVCB at KNH unlike MP Shah Hospital brought about improved DMMPs. Therefore patients at KNH found the HCPs nonverbal communicative behaviour more appealing during their interaction than the patients at MP Shah Hospital. The plausible reasons could be that in regard to nonverbal communicative behaviour, patients found HCPs at KNH more positively expressive as they engaged them unlike the HCPs at MP Shah Hospital.

4.1.5. Hypothesis Testing.

Ho: There is no significant effect of nonverbal communicative behaviour during healthcare provider patient interaction on diabetes management practices in selected hospitals in Kenya. On simple linear regression, nonverbal communicative behaviour had significantly positive effect on diabetes mellitus management practices overall in Kenya, at Kenyatta National Hospital and the MP Shah hospital, $p < 0.001$. However, multiple regression model 1(adjusted-communication variables) showed there was significantly positive effect of nonverbal communicative behaviour on diabetes mellitus management practices, p=0.016 overall in Kenya, at KNH, p=0.002 but not at MP Shah Hospital, p=0.899. Thus, the null hypothesis was hence rejected overall in Kenya and at KNH and not at MP Shah Hospital. Therefore, there was significant effect of nonverbal communicative behaviour on diabetes mellitus management practices overall in Kenya; at KNH and not at MP Shah Hospital.

4.2. Discussion

The place of nonverbal communicative behaviour as a domain in healthcare provider patient communication in DM management practices among patients is crucial to glycaemic control, hence health outcome with consequent impact on the patients quality of life. The findings showed that nonverbal communicative behaviour was responsible for improvement in diabetes mellitus management practices among all patients overall in Kenya and at Kenyatta National Hospital but not at MP Shah Hospital. As there is no much information on past studies specific about NVCB effect on diabetes mellitus, direct comparisons are not quite plausible. However, a study on communication by Beck, Daughtridge & Sloane, 2002 align to the current study findings in that physician behavior can enhance favorable patient outcomes, such as understanding and adherence to medical regimens and overall satisfaction. The researchers

intimated that nonverbal behaviors had been found to be significantly associated with outcomes of interest.

As noted in studies done elsewhere, the findings in this study do compare to some extend though with variations especially on the specific components of NVCB. At Kenyatta National Hospital, there was low rating on waiting time before the patients were attended to with the female patient gender was even less satisfied on this aspect than the male patient gender. This finding lends credence to Abdulhadi et al, 2007 study outcome that long waiting time despite being given appointments was an issue that was raised spontaneously by almost all the patients and was expressed as stressful and unacceptable. At MP Shah Hospital, on the aspects of: the patients were encouraged and were comfortable by the way the healthcare providers were sitting/standing while attending to them as regards body posture and; the healthcare providers kept quiet for reasonable amount of time to listen to what the patients said during their interactions in account to silence, the low ratings by male patients could be an indication of the less satisfaction by the male patients in regard to healthcare providers' nature of nonverbal communication and past studies articulate this fact. Kourkouta & Papathanasiou (2014) noted that what of course in any case should be avoided by the caregivers was silence and indifference to the questions of the patient as in the best cases, the patient will leave disappointed and in the worst really indignant with healthcare providers. According to Travaline, Ruchinskas, D'Alonzo, Jr. (2005), body position can greatly affect the quality of one-to-one communication between the patient and physician. In concurrence also, Mickel, McGuire & Gross-Gray (2013) stated that nonverbal behaviors that include interruptions and silence are thought to imply power or dominance as negatively impacting patient outcomes. This does show how critically important body posture and silence are when it comes to patient provider interaction and does give valuable weight to the findings on these two areas at MP Shah hospital as particularly rated by the male patients.

Comparisons between the hospitals showed that nonverbal communicative behavior was rated significantly higher at MP Shah Hospital than at KNH ($p=0.010$). This depicts that healthcare providers NVCB at MP Shah hospital unlike for their counterparts at KNH was quite appealing to the patients and in a way fostered better diabetes mellitus management practices to a great extent. Does this then mean nonverbal communicative behaviour was unsatisfactory at KNH! In response it would be postulated that the NVCB though not as satisfactory as among patients at MP Shah Hospital, at KNH the patients were still satisfied but not to a level and extend as expected and expressed by the patients.

Also significantly higher scores were computed at MP Shah Hospital than at KNH in regard to the aspects of: the body language of the healthcare providers communicated caring and concern ($p=0.001$); the healthcare providers sat in an appropriate manner and physical distance in relation to me during our interaction as regards proximity ($p=0.004$); the patients were encouraged and comfortable by the way the healthcare providers were sitting/standing while attending to them as regards body posture ($p=0.018$); the healthcare providers looked at the patients, did not seem distracted, attended to patients physical comfort, had genuine interest in patients as a person, and listened patiently and carefully to what the patients had to say as concerns attention ($p=0.001$) and the healthcare providers' spoke in a voice that showed patience and calmness while attending to patients in relation to tone of voice ($p=0.008$) as compared to those of KNH. This showed that patients at MP Shah Hospital were agreeable, more satisfied and much happier in

the preceding five (5) areas unlike the patients at KNH. In support of these findings, Travaline, Ruchinskas, D'Alonzo, Jr. (2005) argued that at the very least, the attentive physician will have a more satisfied patient and too, the physician's body language also speaks volumes to the patient. The researcher still noted that for both the physician and patient, images of body language and facial expressions were likely be remembered longer after the encounter than any memory of spoken words. This is a clear indication of the powerfully satisfying effect of nonverbal communicative behaviour when healthcare providers interacted with the patients, hence the differences in outcome at the two hospitals.

As in the present study, Beck, Daughtridge & Sloane (2002) documented of no association having been found for the amount of physician touch and physician-patient distance as a nonverbal communication indicator. Though the case, the current study findings on whether the healthcare providers sat in an appropriate manner and physical distance in relation to patients during their interaction differ in that patients' ratings for HCPs were significantly higher at MP Shah Hospital in comparison to KNH. This is a likely indication that there is an association in regard to physical distance. Conversely, Khan et al, 2014 demonstrated the importance of touch in addition to eye contact during the physician's consultancy unlike in the current study where patients' rating on whether the touch by the healthcare provider was appropriate whenever they were examined and did seek patients' permission first was insignificant.

The present study results affirms Mickel, McGuire & Gross-Gray (2013) findings in regard to physician proximity and lean, tone of voice, expressiveness and body position. These were significantly linked to patient satisfaction and compliance and that physician speed and volume of talking correlated with patient satisfaction levels. The study further noted that physicians with previous malpractice claims were significantly connected to ratings of lower concern in tone of physician voice and higher dominance; areas that were rated highly by patients in the current study. Abdulhadi et al (2007); Travaline, Ruchinskas & D'Alonzo, Jr. (2005) found that patients' encounters with healthcare professionals who were friendly and welcoming were considered as satisfying to patients with diabetes as ratings in this study indicate. Abdulhadi et al (2007) argued that attentive listening; eye contact with less gazes; uninterrupted consultation; and consultation lengths are important factors for a good patient-doctor communication and relationship. This is a clear show of the relevance of this past finding on the ratings as presented in this study, hence the level of satisfaction by patients on these communication aspects in NVCB as well. Contrary to the current study on touch by the healthcare provider, Montague, Che, Xu, Chewning & Barrett (2013) stated that increasing social touch during the health encounter does not increase patient ratings as expected, but that social touch can lead to better patient assessment of clinician in moderation. In addition, greater clinician listening was associated with greater patient satisfaction as revealed by Henry et al (2012) as is noted by the high ratings in this study. Another study found out that affiliative nonverbal behavior of the physician was related to higher patient satisfaction as put forth by Mast (2007) and as is in this present study, the ratings were high on some of this behaviours such as the extend of proximity or physical distance from the HCPs.

With paucity of literature from previous studies specific to NVCB and DMMPs on the performance outcome at public hospitals in comparison to private hospitals in some instances as found in this study, related past studies on communication were found to largely contrast with

this finding. Adhikary, 2018 study found the satisfaction level to be highest among patients for the healthcare givers in private facilities than in the public facilities, a finding in consonant with the current study on the specific components of NVCB. Soysal & Yağar, 2017 study observed that patients in public institutions had higher level of satisfaction in the level of communication with the doctors which to some extend mirrors the outcome in the current study on the overall picture of NVCB. However in view of the foregoing, the expectation of the patients at the each of the hospitals ought to be put into consideration when interpreting the current study findings as their attendance at the different hospitals is influenced by other factors like socioeconomic status.

5.0. CONCULUSION AND RECOMMENDATIONS

5.1. Conclusion

It was established that nonverbal communicative behaviour led to better and improved performance in diabetes mellitus management practices among the patients in Kenya and at Kenyatta National hospital. At MP Shah Hospital, nonverbal communicative behaviour was not a factor in the diabetes mellitus management practices performance among patients. As such patients at KNH were more likely to achieve well managed and controlled diabetes mellitus than those at MP Shah Hospital.

5.2. Recommendations

Although theoretical approaches as applied in this study are helpful, theoretical basis of communication in healthcare practice still remain overlooked and has been applied only sparingly. Therefore, healthcare providers need effective communication skills guided by theory as shown in this study in order to achieve better provider-patient exchange. In regard the following recommendation are made to the various stakeholders'.

5.2.1. Recommendations to the medical practice, professionals and healthcare facilities

Nonverbal communicative behaviour need to be well conceptualized and incorporated at healthcare facilities with programs touching on each of its components to equip healthcare providers with the required communication skills. Emphasis on components of nonverbal communicative behaviour is necessary in regard to the male gender with particular attention at public healthcare settings. At private healthcare settings, focus to enhance on NVCB effectiveness as a domain in healthcare provider patient communication (HCPPC) on the part of HCPs in view of the patients would be of paramount importance as it was found to be of no consequence in improving DMMPs among patients.

5.2.2. Recommendations to the policy makers

Though nonverbal communicative behaviour effect on DMMPs was significant at KNH, MP Shah Hospital was rated better on specific component of NVCB than KNH. Since there is hardly any law /policy on HCPPC; this should hence be call on policymakers in government and ministry of health to come up with programmes guided by laws and policies to strengthen on the components at private hospitals with particular attention to enhancement of NVCB at the public hospital settings as a way to bolster on DMMPs among patients at both private and public hospitals. A standard healthcare provider patient nonverbal communicative behaviour model

based on theory as demonstrated in this study need to be developed and applied in healthcare for DM management.

5.2.3. Recommendations to the training institutions

There is need for development and introduction of healthcare provider patient nonverbal communicative behaviour as a communication aspect in the medical education curriculum to enable it to be part and parcel at training institutions as a necessary requirement in medical practice. This should be through training with requisite guidelines given on the general conduct for the healthcare providers and equally in regard to the patients as consumers of healthcare services to ensure concordance and especially as concerns the specific NVCB domain components. This will in the process advance knowledge on the effect of NVCB on DMMPs in academia.

6.0. SUGGESTIONS FOR FURTHER STUDIES

Investigations on the gender differences in regard to the component of NVCB would be in order. Further research in lieu of the significant differences on NVCB as a HCPPC domain in addition to its components between public and private healthcare settings would shade light on the circumstances that account for such. A qualitative study on NVCB is suggested as it would be more informative in complementing these study findings.

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