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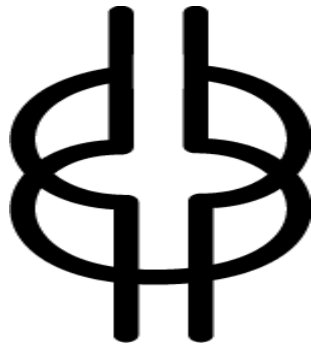
# Relationship between Complications of Disease, Depression and Quality of Life of Type 2 Diabetes Patients in Ghana

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## Abstract

This study sought to understand the relationship between depression, complication of disease and quality of life of type 2 Diabetes Mellitus patients in some selected hospitals in the Central Region of Ghana. The cross-sectional survey design was adopted for the study. A sample of 307 Diabetes patients from 4 hospitals across the Central Region of Ghana were assessed using depression in Diabetes self-rating scale and the Diabetes 39 scales. The purposive sampling technique was used for the selection of the hospitals whilst the convenience sampling method was used for the selection of the participants. One-way analysis of variance and the Pearson Product Moment correlation coefficient were used in the analysis. The study revealed a significant difference between complications of disease and the quality of life of type 2 diabetic patients. It concluded that clinicians perform regular checks to quickly identify and treat complications that arise from the disease to reduce its physical and psychological effect. The need for parents and teachers to ensure that they take good care of their health in order to prevent diabetes and its effects on the education of learners was underscored.

**Key words**: Diabetes Mellitus, depression, complications, quality of life, education, learners.

## Introduction

*Diabetes Mellitus* is described as a chronic metabolic disease, characterized by a disorder in the metabolism of carbohydrates, lipids

and amino acids, either as a result of decreased insulin secretion, or due to a reduction in insulin sensitivity of the cells of the body cell (Papazafiropoulou, Tamvakos, & Pappas, 2008). The cardinal clinical symptoms used as indications for diagnosis include polyuria (frequent urination), polydipsia (increased thirst), polyphagia (increased hunger) and unexplained weight loss. These indications, although may vary in intensity and frequency among patients with *Diabetes Mellitus*, still serve as one of the clinical measures through which diagnosis may be reached (World Health Organisation [WHO], 2006).

The classification of *Diabetes Mellitus* may vary across scope; it is predominantly classified into several different types based on its cause, pathophysiology, and management. The major classifications of Diabetes are Type 1 Diabetes (formerly called *Insulin-Dependent Diabetes Mellitus),* Type 2 Diabetes (formerly called *Non-Insulin Dependent Diabetes Mellitus*), and *Gestational Diabetes Mellitus* (which occurs during pregnancy) (ADA, 2003a). Type 1 *Diabetes Mellitus* is noted to account for about 5% to 10% diabetic cases. It has an acute onset and predominantly occurs before 30 years of age (Centres for Disease Control and Prevention [CDC], 2002). This type affects the pancreatic beta cells, which produces insulin in the human gastrointestinal system for the metabolism of ingested food as digestion ensues. On the other hand, about 90% to 95% diabetic cases are Type 2 *Diabetes Mellitus* (CDC, 2002). This mostly occurs as an effect of diminished sensitivity to insulin and damaged pancreatic beta cells which lead to a low level of insulin (Quinn, 2001).  Due to its pathophysiology and its late occurrence (usually after 30 years), Type 2 Diabetes is managed with diet, exercise, oral agents and insulin injection therapy (ADA, 2003a).

A well-noted aspect of both Type 1 and Type 2 Diabetes is that both can result in serious complications if the right precautions in care are not taken. These complications are broadly classified into retinopathy (damage to the eyes), nephropathy (damage to the kidneys), and neuropathy (damage to the nerves), for which a careful glucose control is needed (ADA, 2003b). A common clinical manifestation arising from retinopathy may be an increase from a subtle vision problem to potential and/or complete vision loss. Neuropathic complications are also manifested in the forms of foot ulcers, and poor healing which may later require amputations. In some neuropathic cases

too, sexual problems like erectile dysfunctions are evident. Nephropathic disorders leading to various types of renal disorders like kidney failure are also possible. Owing to the devastating nature of *Diabetes Mellitus*, the central goal of treatment has been focused on reducing the risk of patients clinically diagnosed with Diabetes from developing any of these main vascular and neuropathic complications (ADA, 2003b).

Quality of life is noted to be greatly reduced in patients with chronic diseases such as *Diabetes Mellitus*. The concept of Quality of life (QoL) is associated with the subjective perception of people about their lives, within specific cultural and social systems. Quality of life issues as denoted by Maatouk et al., (2012) indicate the state of loss and decline in a person's perception of life's goodness with influences from past and/or present life events. They expanded these perceptions that the quality of life of adult patients with Diabetes was affected by some factors like mood, physical and other problems. Significant among these factors were depression, Diabetes related complications and other negative lifestyle behaviours which served as a way of adjusting to their perceived loss.

Quality of life varies with individuals, societies, people with Diabetes and non-Diabetes and it depends on diet and physical activity, controlling the disease complications and health improvements accomplished (Hu, Gruber, & Hsueh, 2010; Rubin & Peyrot, 1999). It is known to affect mental, physical, social wellbeing and daily lives. Psychological distresses such as depression, anxiety and sleep disturbances can have a negative impact on quality of life. The risk of depression is higher in individuals living with Diabetes, undiagnosed Diabetes and impaired glucose metabolism that have serious threat to quality of life (Nouwen et al., 2011). The prevalence of depression is also higher in diabetic (24%) than the non-diabetic (17%) with significant differences in quality of life indices between depression with Diabetes and non-Diabetes (Goldney et al., 2004).

In 2012 and 2013, Diabetes resulted in 1.5 to 5.1 million deaths per year, making it the 8th leading cause of death in the world (World Health Organization [WHO], (2006), International Diabetes Federation [IDF], 2013). Currently, it is reported that 387 million people have Diabetes in the world of which more than 22 million people are within the African region (International Diabetes Federation [IDF], 2015).

In Ghana, there is a growing increase of *Diabetes Mellitus* with patients suffering various complication and high rate of mortality (IDF, 2015; de-Graft 2003). According to the International Diabetes Federation (IDF) (2015), about 450,000 Ghanaians are now living with diagnosed *Diabetes Mellitus* with a prevalence rate of 3.3% at the end of 2014. The effects of such ill-health on the education of learners have also been reported. For example, School and Health (2018) states in general that improving health and nutrition brings the greatest education benefits to the poor and most vulnerable. More important, education can contribute to psychological development through enhancing an individual's self-efficacy, apart from increasing psychological resilience and improving coping mechanisms (Higgins, Lavin & Metcalfe, 2008).

Most diabetic patients are subjected to extreme stress when accessing treatment for their health condition which is enough to cause psychological distress (de-Graft, 2003). However, the treatment that is provided to these patients tends to focus on the physical illness neglecting the psychological issues that accompany diabetes. It also appears that not many studies have been conducted to explore the relationship of these psychological challenges on the quality of life of the type 2 Diabetes patients in Ghana. Understanding these constructs in relation to the disease is unclear. Therefore, a study specifically designed to identify these among Ghanaians is essential. This will help understand the relationship of these variables to the disease and more important help identify the implications to education. This study thus looked at:

1. the difference between the various complications of the disease and quality of life of type 2 *Diabetes Mellitus* patients.
2. the relationship between complications of type 2 *Diabetes Mellitus* patients and depression.
3. the relationship between depression and quality of life of type 2 *Diabetes Mellitus* patients.

**Methodology**

This study employed the cross-sectional survey as its research design. A cross sectional survey collects information from a sample that has been drawn from a predestined population and is collected at just one point in time (Dillman, 2000; Groves, Cialdini, & Couper, 1992).

This type of design was selected because of its ability to measure relationship between variables. It enables researchers to recognize trends and patterns in data collected as expected in this study.

The target population for this study comprised diabetic patients who had been registered with the Diabetic Clinic of the Cape Coast Teaching Hospital (CCTH), Agona Swedru District Hospital, Winneba Government Hospital, and St. Luke's Catholic Hospital (Apam) from January 2014 to December, 2015. This population was chosen due to the fact that it covered individuals with various socioeconomic and disease characteristics across the Central Region. The total population registered in the various diabetic clinics within the period was 1,542. At the Agona Swedru District Hospital and Cape Coast Teaching Hospital, 315 and 737 patients were recorded respectively. Again, 291 patients were recorded at the Winneba Government hospital and 199 patients for St. Luke's Catholic Hospital at Apam (The client register of the various diabetic clinics, 2015)

The study sample consisted of only type 2 diabetic out-patients currently on treatment at the diabetic clinics in the four selected hospitals in the Central Region. According to Krejcie and Morgan (1970), out of a given a total population of one thousand five hundred and forty two (1,542) diabetic patients, a sample of 307 can be used for the study. An additional thirty (30) respondents representing 10% of the sample obtained were added to decrease the chances of non-response case effects on the test outcomes making a total of 337 respondents.

Purposive sampling was used to select four Hospitals namely Cape Coast Teaching Hospital (CCTH), Agona Swedru District Hospital, Winneba Government Hospital, and St. Luke's Catholic Hospital (Apam). Purposive sampling is a qualitative sampling procedure in which researchers internally select individuals or sites to learn about or understand the central phenomena. In selecting participants for the study, the convenience sampling approach was used. Convenience sampling or accidental sampling involves choosing the nearest individuals to serve as respondents and continuing the process until the required sample has been obtained or those who happen to be available or accessible at the time (Cohen, Manion & Morrison, 2007). This technique was chosen because the participants in the study were out-patients and only visited the facilities when it was time for their review. At the Agona Swedru District Hospital and Cape

Coast Teaching Hospital, 64 and 146 respondents were selected, respectively. Also, 58 respondents were selected at the Winneba Government hospital and 39 respondents for St. Luke's Catholic Hospital at Apam giving a total of 307 respondents for the study.

The inclusion criteria established for participation in the study incorporated: participants aged between 20 and 65 years who were willing to participate, meet the clinical medical diagnosis for Type 2 Diabetes (Fasting Blood Sugar (FBS) ≥7.0 mmol/l or Random Blood sugar (RBS) ≥11.1 mmol/l), had started biomedical therapy for Diabetes and could read and write.

The instruments used in data collection were a 7-item self-designed questionnaire for collecting background data and disease-specific tools for assessing the psychological constructs. The disease-specific tools were employed in the study for us to be able to assess and understand the psychological condition as it pertains to the patients with the disease under study. The tools used were: the Depression in Diabetes Self-Rating Scale and Diabetes 39 Scale (Kokoszka, 2008).

The depression in Diabetes self-rating scale is a self-report measure designed by Kokoszka (2008) to assess depression in type 2 Diabetes patients. The scale is made up of 6 items. A respondent is asked to rate how much he/she agrees with the statements on a 5-point likert scale response format. The scores ranged from 1, I fully agree; 2, I partially agree, 3, hard to say; 4, I partially disagree; to 5, I fully disagree. The scale also yields a total score of depression in patients. The reliability of the Depression in Diabetes Self-Rating Scale is high (Cronbach's alpha= 0.81). The scale also demonstrates a good validity, as measured by Pearson's coefficient of correlation with the overall Becks Depression Inventory (BDI) score (r = 0.72), overall Hamilton Depression Rating Scale (HDRS) score (r = 0.68) and the Hospital Anxiety Depression Scale (HADS) score (r = 0.68). A pilot-test conducted at the University of Cape Coast Hospital of the scale yielded a Cronbach's coefficient alpha of 0.71.

The Diabetes-39 questionnaire was developed to specifically assess the quality of life of diabetic patients. The tool uses a visual analogue scale for each question on which the respondent places an 'X' to indicate level of agreement to the question. The scale ranges from not at all affected to extremely affected. It is made up of 39 items that assess the diabetic patients' quality of life based on five subscales:

Energy and Mobility, Diabetes Control, Anxiety and Worry, Social Burden, and Sexual Functioning. Reliability of the 39-item instrument as measured by Cronbach's coefficient alpha ranged from 0.82 to 0.93. The pre-test of the instrument also produced a Cronbach alpha of 0.82 and was considered very good for the study.

## Data Analysis

In the descriptive statistics, means, standard deviations and frequencies were calculated. One way analysis of variance was used for the comparison of mean score values between complications of disease and quality of life whereas Pearson correlation coefficient was used to assess the relationship between depression and complication of disease and quality of life respectively.

## Results

**Table 1: Socio-demographic characteristics of Respondents (n=307)**

| Variables | Sub-scale | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 70 | 22.8 |
| | Female | 237 | 77.2 |
| Age group | 20-29 years | 3 | 1.0 |
| | 30-39 years | 14 | 4.6 |
| | 40-49 years | 35 | 11.4 |
| | 50+ years | 255 | 83.0 |
| Marital Status | Single | 24 | 7.8 |
| | Married | 167 | 54.4 |
| | Divorced | 33 | 10.7 |
| | Widowed | 83 | 27.1 |
| Educational Level | No Formal | 81 | 26.4 |
| | Education | 84 | 27.4 |
| | Basic | 103 | 33.6 |
| | Secondary | 39 | 12.6 |
| | Tertiary | | |
| Occupation | Unemployed | 99 | 32.2 |
| | Self employed | 138 | 45.0 |
| | Public servant | 70 | 22.8 |

| Years lived with Diabetes | 6months-10 years | 231 | 75.3 |
|---|---|---|---|
| | 11-20 years | 62 | 20.2 |
| | 21-30 years | 10 | 3.2 |
| | 31-40 years | 4 | 1.3 |
| Complication of disease | Hypoglycaemia | 16 | 5.2 |
| | Hyperglycaemia | 21 | 6.8 |
| | Ulcers | 16 | 5.2 |
| | Kidney problems | 11 | 3.6 |
| | Loss of feeling | 79 | 25.7 |
| | Eye problems | 164 | 53.5 |

Table 1 represents the socio-demographic characteristics of patients who completed the study questionnaire expressed in frequencies and percentages. The mean age of respondents was 6.64 (SD=0.94), 22.8% were males, 77.2% females and the mean duration of Diabetes was 7.8years (SD=7.1). About 33% had obtained secondary education, 45% were self-employed. 75% had lived with the disease for < 10years. 55.5 % were married whiles 53.5% suffered complications of the eye (retinopathy).

**Table 2: Type 2 Diabetic Patients' State of Depression (n=307)**

| Variables | Frequency | Percentage (%) |
|---|---|---|
| Low severity of depression | 0 | 0.0 |
| Moderate severity of depression | 13 | 4.2 |
| High severity of depression | 294 | 95.8 |

Source: Field survey (2016)

Table 2 indicates the state of depression of Type 2 diabetic patients. Majority of the respondents had high severity of depression. Out of the 307 respondents who were involved in the study, none of the respondents had low severity of depression, 13 respondents representing 4.2% had moderate severity of depression, and 294 respondents representing 95.8% had high severity of respondents.

**Table 3:** *Quality of Life of Type 2 Diabetic Patients (n=307)*

| Variables | M | SD |
|---|---|---|
| Energy and Mobility | 21.88 | 11.67 |
| Diabetes control | 26.59 | 12.32 |
| Worry and anxiety | 20.70 | 10.03 |
| Social functioning | 18.32 | 9.94 |
| Sexual functioning | 6.39 | 5.38 |

Source: Field survey (2016)

As evident in Table 3, a high mean of 26.88 (SD= 12.32), 21.88 (11.67), 20.70 (SD= 10.03), and 18.32 (9.94) were recorded for the items under the themes Diabetes control, energy and mobility, worry and anxiety, and social functioning respectively. This indicates that majority of the respondents indicated that their diabetic condition had not affected their quality of life in terms of Diabetes control, energy and mobility, worry and anxiety, as well as social functioning. However, the high standard deviations of 12.32, 11.67, 10.03, as well as 9.94 recorded for the items Diabetes control, energy and mobility, worry and anxiety, and social functioning respectively implies that there were variations in the responses recorded and that, some of the respondents conceded that their diabetic condition had affected their Diabetes control, energy and mobility, worry and anxiety, and social functioning. Yet, it still holds that majority of the respondents agreed that, their diabetic condition had not affected their quality of life in terms of Diabetes control, energy and mobility, worry and anxiety, as well as social functioning. A low mean of 6.39 (SD=5.38) was recorded for items under the theme sexual functioning indicating that the respondents conceded that their quality of life in terms of sexual functioning was affected. The low standard deviation of 5.38 shows that there were little variations in the responses recorded for this item and that the respondents agreed to the statement to a high extent.

The One-way analysis of variance (ANOVA) was used in the analysis of the difference between the complications suffered by the diabetic patients and quality of life of the respondents.

**Table 4: Descriptive Statistics of Quality of Life of Diabetic Patients regarding Complications**

| Educational Level | N | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Hypoglycaemia | 16 | 61.00 | 20.97 | 39.00 | 105.00 |
| Hyperglycaemia | 21 | 97.00 | 42.01 | 4.00 | 169.00 |
| Ulcers | 16 | 1.25 | 52.33 | 52.00 | 210.00 |
| Kidney Problems | 11 | 90.82 | 37.66 | 40.00 | 150.00 |
| Loss of feelings | 79 | 97.85 | 39.87 | 39.00 | 200.00 |
| Eye Problems | 164 | 94.36 | 37.02 | 39.00 | 196.00 |
| Total | 307 | 93.78 | 39.35 | 4.00 | 210.00 |

Source: Field survey (2016)

Table 4 gives information about the complications of the diabetic patients in relation to their quality of life. From the statistics on the complications of the diabetic patients, respondents with loss of feelings complication had the highest mean score regarding quality of life, followed by hyperglycaemia complication, eye problem complication, kidney problem complication, hypoglycaemia complication as well as ulcer complications respectively.

From the preliminary analysis, the Levene's test was used to ascertain whether the variance in the scores is the same for each of the complications suffered by the Diabetes patients. From the analysis, the Significance value for Levene' test is 2.382 which is greater than the alpha or critical value of 0.05. This implies that the assumption of homogeneity has not been violated for this sample [$F$ (6, 300) = 4. 897, $p$ = .0.000 at the 0.05 alpha level

**Table 5: Summary of One-way ANOVA**

|  | Sum of Squares | Df | Mean Square | F | Sig |
|---|---|---|---|---|---|
| Between Groups | 42269.102 | 6 | 7044.850 | 4.897 | .000 |
| Within Groups | 431609.836 | 300 | 1438.699 |  |  |
| Total | 129483.642 | 306 |  |  |  |

Source: Field survey (2016)

The Table 5 shows whether the overall *F* ratio for the one-way ANOVA is significant. The F ratio (4.897) is significant ($p = .000$) at the .05 alpha level. This implies that there is a statistical significant difference among the mean scores on the complications suffered by the diabetic patients in relation to their quality of life. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for hypoglycaemia (M = 61.00, SD = 20.97) was different from ulcers (M = 1.25, SD = 52.33), loss of feelings (M = 97.85, SD = 38.87) and eye problems (M = 94.36, SD = 37.02). However, Hyperglycaemia (M = 97.00, SD = 42.01) and kidney problems (M = 90.83, SD = 37.66) did not differ from the various complications. The effect size, calculated using eta squared, was 0.33. This implies that the actual difference in mean scores between the groups was moderate based on Cohen's *d* (1988, pp. 284–287) interpretation of effect size. Therefore, there is a statistically significant difference at the p < 0.05 level in the complications of diabetic patients regarding the quality of life they lived. [F (6, 300) = 4.897, p = 0.000].

**Table    6:    Correlational    Analysis    between    Depression, Complications and Quality of Life of Type 2 Diabetes Mellitus Patients**

|  |  | Complications | Quality Of Life |
|---|---|---|---|
| Depression | Pearson Correlation | .027 | .120** |
|  | Sig. (2-tailed) | .632 | .036 |
|  | N | 307 | 307 |

** Correlation is significant at the 0.05 level (2-tailed).
Source: Field survey (2016)

Table 6 indicates correlation analysis between depression and complications of Type 2 *Diabetes Mellitus* patients. The relationship between Depression and Diabetes complications was analysed and discussed using Pearson product-moment correlation co-efficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a low, positive correlation between the two variables, $r = .027$, $n = 307$, $p > 0.05$, with high levels of depression associated with high levels of Diabetes complications. The correlation between depression and

Diabetes complications was not statistically significant with a *p*-value of more than 0.05. This implies that depression is not a significant factor that influences Diabetes complications. The correlation co-efficient ($r^2$) between depression and Diabetes complications was 0.0007. Depression explained nearly 1 per cent of the variance in respondents' scores on Diabetes complications. It is concluded that depression is positively related to Diabetes complications and for that matter, depression is not a significant factor in influencing Diabetes complications; hence the hypothesis which stated that depression is significantly related to Diabetes complications is rejected.

Again, Table 6 indicates correlation analysis between depression and quality of life of patients living with type 2 *Diabetes Mellitus*. The relationship between depression (as measured by depression in Diabetes self-rating scale) and quality of life (as measured by the Diabetes 39) was analysed and discussed using Pearson product-moment correlation co-efficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a low, positive correlation between the two variables, $r = .120$, $n = 307$, $p < 0.05$, with high levels of depression associated with high levels of quality of life of diabetic patients.

**Discussion**

The cross-sectional survey was used to examine the relationship between depression, complication of disease and the quality of life of type 2 *Diabetes Mellitus* patients in the central region of Ghana. The results indicated that patients' quality of life was significantly affected by the complications they suffered. There were significant differences in the type of complications and the quality of life patients lived.

Generally, the quality of life of type 2 *Diabetes Mellitus* patients as measured by the Diabetes 39 was relatively high. These findings were in contradiction to a number of studies conducted to assess health-related quality of life in patients with Diabetes (Koopmanschap, 2002; UK Prospective Diabetes Study Group, 1999; Vileikyte, 2001). These studies demonstrate a reduced quality of life in patients with Diabetes (Peyrot, Rubin, Lauritzen, et al., 2005). A study of the impact of Diabetes on overall quality of life identified four major themes (Faro, 1999): restriction, being different from others, negative emotion, and adaptation. Adolescents were most bothered about dietary restrictions,

and were worried most about the future, specifically diabetic complications. Older adolescents, however, had lower worry and had a better quality of life.

Depression as measured by the depression in Diabetes self-rating scale report was seen to be high among type 2 *Diabetes Mellitus* patients who participated in the study. These findings were in congruence to the view that, the depression appears to be linked with the occurrence of Diabetes. In 1684, Thomas Willis, the physician who first identified glycosuria as a sign of Diabetes, suggested that Diabetes resulted from sadness or long sorrow and other depressions or disorders (Rubin & Peyrot, 1992). Further studies have demonstrated that a comorbid state of depression incrementally worsens health compared with depression alone (Moussavi, Chatterji, Verdes, Tandon, Patel, & Ustun, 2007). According to the latest global burden of disease estimates unipolar depressive disorder are third in the ranking (65.5 mil DALY worldwide). Unipolar depressive disorders are set to become the leading disease in 2030 with 6.3% of the overall burden and Diabetes the 10th place with 2.3% as a percentage of the overall DALYs (World Health Organization, 2008).

Additionally, several studies also confirm this finding. A study by Raval, Dhanaraj, Bhansali, Grover and Tiwari (2009) on the prevalence and determinants of depression in patients with established type 2 Diabetes (T2DM) attending a tertiary care hospital in North India, showed high prevalence of depression in patients with type 2 *Diabetes Mellitus*.  Other studies conducted to explore the association of Diabetes with depression and the bidirectional nature of this relationship; considering that depression may occur as a consequence of having Diabetes, but may also be a risk factor for the onset of type 2 Diabetes (Eaton, 2002; Knol, Twisk, et al., 2006). One study showed how there is a higher risk of mood and anxiety disorders among individuals with Diabetes relative to those without (Lin, & Von Korff, 2008). A meta-analysis also concluded that the presence of Diabetes doubles the odds of comorbid depression and the prevalence of comorbid depression among people with Diabetes was 11% (Anderson, Freedland, et al., 2001).

**Complications of Diabetes and Quality of life**

The difference between complications of Diabetes and quality of life of type 2 Diabetes patients was assessed and a statistically significant difference was found at the $p < 0.05$ level in the complications of diabetic patients regarding the quality of life they lived. [$F_{(6, 300)} = 4.897$, $p = 0.000$]. Findings from the One-Way ANOVA is in line with studies that, the quality of life of diabetic patients is significantly reduced in the presence of both microvascular and macrovascular complications (Rubin, & Peyrot, 1992; The Oxford International Diabetes Summit, 2002; Peyrot, Rubin, Lauritzen, et al., 2005). In addition, peripheral neuropathy complications affects health related quality of life in diabetics as well as retinopathy, coronary disease, and kidney disease (Venkataraman et al., 2012).

A study conducted by Luk, Zhang, Ko, Brown, Ozaki, Tong, Ma, Tsang, Cheung, Kong et al., (2014) aimed at examining clinical factors associated with Health Related Quality of Life (HRQOL) also revealed that age, female gender, obesity, hypoglycemia at least once monthly, presence of cardiovascular disease, nephropathy and sensory neuropathy were independently associated with lower quality of life, while hypertension and use of insulin were associated with higher quality of life. Apart from demographic characteristics, risk factors, complications and treatment all influenced HRQoL.

Again, contrary to the findings, studies by Lustman et al., (2000) in their meta-analysis noted that depression is associated with hyperglycemia in persons with type 1 and type 2 Diabetes. De Groot, Anderson, Freedland, Clouse, and Lustman (2001) in their meta-analysis to further explore the association between depression and diabetic complications showed significant relationships between depression and a variety of Diabetes complications such as diabetic retinopathy, nephropathy, neuropathy, macrovascular complications, and sexual dysfunction.

**Implications/Recommendations**

Though the study was based on clinical settings, it has several practical implications not only in Health delivery, but also education. In terms of health, it establishes that there is a statistically significant difference in the complications of diabetic patients regarding the quality of life they lived. Secondly, it identifies that depression is significantly

related to the quality of life of type Diabetes patients. However, though it found a positive relationship between depression and complications of disease it was not significant factor. Clinicians should therefore actively perform regular checks to quickly identify and treat complications that arise from the disease to reduce its physical and psychological effect. Regular psychological screening should also be conducted at the various facilities to identify depressive symptoms related to the development of complications. Psychologist must be involved in the management of the diabetic clinics to facilitate these activities.

In the area of education, the impact of parental involvement in their children's education is generally acknowledged by all. If parents are in good health and not prone to diabetes with its associated complications, they can provide better care for their wards. In another context, where teachers are diabetic and have to report regularly at the clinic/hospital, his or her continuous absence from school could seriously affect the pupils' academic work. It therefore behooves parents and teachers to ensure that they take good care of their health in order to prevent diabetes and its effects.

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