The Influence of Family/Social Support on Adherence to Diabetic Therapy

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ABSTRACT

Diabetes is one of the major concerns in the third millennium, affecting more people every day. It is a chronic disease that currently has no cure but can be controlled. In order to manage and control diabetes successfully, patients must adhere to treatment regimens that include dietary restrictions, physical activity goals, and self-monitoring of glucose levels. Numerous factors affect patients' ability to adhere properly, the example is self-efficacy, treatment expectations, health beliefs, and lack of social support. Consequently, diabetes management can be quite complex, requiring lifelong commitment and drastic changes to the patient's lifestyle. This study was descriptive and cross-sectional in design. It was done in the outpatient clinic of a tertiary health facility in a rural area of Edo state, Nigeria. Confirmed diabetic patients who were on treatment, who were 18 years and above, and who attended the outpatient clinic during the study period, were enrolled for the study after obtaining an informed consent from them. A semi-structured, interviewer-administered questionnaire was used to obtain relevant information from them. The Multidimensional Scale of Perceived Social Support (MDSPSS) was used to assess the level of social support the respondents receive from family and friends. The Morisky Medication Adherence Scale-8 (MMAS) was used to assess the level of adherence to medication. Data were collated and analyzed using the IBM-SPSS version 21.0

The mean age of the respondents was 56 ± 11.495 years, with most of the respondents (63.9%) aged 46-65 years, and with more females than males. About 48.8% were found to have high social support, 40.5% had moderate support, while 10.8% had low social support. Most of the respondents (70.9%) had low adherence, 19.6% had moderate adherence, while 9.5% had high adherence. There was the significant association between social support and medication adherence, social support, and clinic attendance, social support and BMI, but no significant association between social support and blood sugar level. Since social support can predict health-promoting behavior, it can also predict self-care behavior of patients with DM. Therefore, getting the family members, especially the spouse, involved in self-care behavior can be of significant importance in providing health care to patients with diabetes.

.Key words: Chronic disease, Diabetes, Morisky Medication Adherence Scale-8.

1. INTRODUCTION

Diabetes mellitus (DM) is known as one of the major public health concerns in the third millennium, and it is the fifth main cause of mortality in the world [1]. It is a disease that kills about 4 million people every year, which is 9% of the deaths all over the world [2]. In America, about 24 million Americans are affected by DM, making it one of the most common chronic conditions in the United States of America [3]. Current empirical research suggests that the number of individuals diagnosed with DM (per year) is expected to double by the year 2034 [3]. Diabetes is considered to be the leading cause of heart disease, stroke, kidney failure, lower limb amputation, and blindness among US adults [4,5]. In Iran, a national study which investigated the risk factors of non-contagious diseases estimated the prevalence of diabetes as 7.7% in 2008 [6]. In Sub-Saharan Africa, about 22 million people are affected with DM, and Nigeria being the most populated is home to about 4 million diabetics, or a fifth of all diabetes cases in Sub-Saharan Africa [7]. About 70-80% of this 4 million are either untreated or undiagnosed in Nigeria [7].

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Today, this disease is being paid more attention due to its high prevalence, imposed costs on health systems, and various negative effects on the patients [8]. Presence of chronic complications of DM leads to the decrease in life expectancy, and increase in death, imposes high economic burden on the person, family, and society, and affects the quality of life of the person and his/her family [9]. Consequently, many researchers believe that DM belongs to the person and his/her family [10.11], because suffering from this as a chronic disease disturbs the person's family life and future prospects, [12] threatens their personal independence, and generates a feeling of being different from others [13].

The primary goals in the treatment of diabetes are for patients to maintain proper metabolic control and to reduce the risks of health complications [14]. In recent correlational studies, strong associations between patient non-adherence or non-compliance and progression or development of diabetes-related complications have been found [15]. In the study done by Gherman et al, it was suggested that increases in adherence can result in patients who are more confident in self-care behaviors, and thus have better overall outcome [15].

Adherence to treatment for DM includes tasks such as medication-taking, daily insulin injections, self-monitoring of glucose levels (either daily or several times a day), complex dietary restrictions, frequent eye examinations, and daily exercise routines [3,15]. In addition, patient's ability to self manage their health behavior plays a crucial role in the management of DM, as most diabetics provide more than 90% of their own daily care [14]. The effort of patients to maintain and adhere properly to diabetes management directives often take place in social settings and can alter family and social dynamics [14, 16, 17]. In a study by DiMatteo, support from friends and family promotes adherence by encouraging optimism and self-esteem, which can buffer the stress of being ill and reduce patient depression [18].

The term non-adherence describes the extent to which patients do not follow treatment recommendations given by their health care providers [19]. Non-adherence can be intentional or unintentional, where treatment advice is misunderstood, carried out incorrectly, or ignored [19]. Rates of non-adherence vary widely across different disease conditions, treatment regimens, and patient populations [18]. On average, 25% of patients are non-adherent to treatment, and for patients with chronic disease like diabetes, rates of non-adherence are 50% or more [19,20]. Additionally, among children and adolescents, 50%–70% are non-adherent to medication directives [21]. The economic burden of non-adherence due to preventable complications, hospitalizations, and poor disease outcomes is significant. However, patients and health care professionals fail to recognize that the cause of poor health outcomes may be due to patient non-adherence [20,22]. Non-adherence can occur for lots of reasons, including the financial constraints associated with treatment, medication side effects, difficulty in managing complex treatment regimens, inadequate patient health literacy, and lack of social support [18,19]. Significant health risks in the care of many chronic diseases are also associated with non-adherence. For example, in diabetic patients, non-adherence is associated with poor glycemic control and long-term health complications, such as retinopathy, neuropathy, and renal disease [14,16]. Thus, non-adherence can compromise patient outcomes in many ways. Some research suggests that adherence to even a placebo can be beneficial to patients' health [22].

Several decades of research have focused on understanding the inherent factors leading to change in adherence behaviors. One such factor is the effect of social support on patient adherence to diabetes management [23]. Previous research by Glasgow and Toobert found that family support was the strongest and most consistent predictor of adherence to treatment in patients with type 2 diabetes [24]. In another study of women with gestational diabetes, adherence to dietary recommendations was strongly associated with familial social support [23]. More recently, among children with type 1 diabetes, family conflict, perceptions of nonsupportive parents, and lack of responsibility for diabetes management were associated with poor patient adherence [14,23]. In contrast, positive dimensions of family functioning, including family guidance and control over the management of diabetes, were related to increases in adherence behaviors [14,23]. Furthermore, among elderly patients, social support from family and friends helps patients to remain active in their care when faced with physical, social, and economic vulnerabilities [18, 25].

Social support is one of the emotion-oriented coping mechanisms with the potential power for influencing life quality.[26] Studies have shown a significant relationship between health and social support, so people who receive higher social support have better health.[27,28] Some studies have shown that social support leads to the improvement in health functions and even immunity performance.[29,30]. The findings of the researchers have shown that perceiving social support can prevent the emergence of non-optimum physiological complications in the person, increase the level of self-care and self-confidence, and positively affect physical, mental, and social conditions; thus, it evidently leads to the increase in the performance and improvement of life quality.[31] In general terms, it should be stated that social support has a great impact on human health.[32].

Diabetes disturbs daily performance and social activities of the patient, changes his/her capability for performing normal roles and responsibilities, and creates new roles for him/her. The relationship with the spouse, children, parents, sister, brother, friends, and other members of the social network is not like before. These people more or less depend on others and can support others to a lesser degree. Therefore, their personal interactions with others are limited and they may be isolated in the society. Thus, their

need for social support increases. Social support affects the control of diabetes through two processes: a) direct effect of social support via behaviors related to health, such as encouraging healthy behaviors, and b) moderating effect of social support which helps in the moderation of acute and chronic nervous pressure on health and increase of compatibility with the nervous pressure of the diabetes disease.[33]

This study attempted to ascertain the influence that family/social support has on adherence to diabetic management.

2. METHODOLOGY

This was a descriptive cross sectional study conducted among 158 diabetic patients who were on diabetic therapy. The study was carried out using diabetic patients who were on diabetic therapy, and who attended the outpatient clinic of a tertiary healthcare facility in a rural area of Edo state, Nigeria. The study period was from June to December, 2017. Diabetics on treatment who were 18 years and above, who attended the outpatient clinic during the study period were enrolled for the study, after obtaining an informed consent from them. A semi-structured, interviewer administered questionnaire was used to elicit information from respondents on bio-data, socio-demographics, anthropometric parameters (weight, height, body mass index), physical examination findings, and treatment.

Their weight was measured using a weighing scale to the nearest 0.5kg, with the participants wearing only light clothing and no foot wears. A stadiometer was used to measure the height to the nearest 0.5cm. The weight (in kilograms) was divided by the square of the height (in metres) to obtain the BMI. Using the WHO criteria for obesity, participants with BMI up to $30kg/m^2$ and above, were regarded as obese, those with BMI of $18-24.9kg/m^2$ were regarded as normal weight, while others with BMI of 25-29.9kg/m2 were regarded as overweight. The BP of each participant was measured using a stethoscope and mercury sphygmomanometer after they had rested for 5 minutes. Systolic BP and diastolic BP were measured at Korotkoff Phases 1 and V respectively [34].

Adherence to medication was assessed using the Morisky Medication Adherence scale-8 (MMAS). This tool is an 8-item medication adherence questionnaire. Each item is scored either 1 (for Yes answer) or 0 (for No answer). The total score ranges from 0 to 8. Those with aggregate score of 0 were regarded as having high adherence, those with 1-2 score were regarded as having moderate adherence and those with 3-8 score were regarded as having low adherence. The level of support that the participants receive from their family, friends and special persons in their lives was assessed using the Multidimensional Scale of Perceived Social Support (MDSPSS). This tool contains 12 items and each is scored between 1 and 7. The respondents go through the 12 items, and score each of them from 1 to 7 according to their own rating. The total score is derived from dividing the sum across all 12 items by 12. The aggregate score is thus from 1 to 7. Those with aggregate score of 1-2.9 were regarded as having low support, those with aggregate score of 3-5 were regarded as having moderate support, while those who had an aggregate score of 5.1-7 were regarded as having high support.

Data was collated and analyzed using the IBM-SPSS version 21.0. Results were presented in tables, charts and test of association was done between multidimensional social/family support and other variables such as socio-demographic variables, fasting blood sugar, BMI and Morisky medication adherence score. Statistical test of association such as chi square was carried out, and test of significance was set at $p<0.005$.

3. RESULTS

About two-third of the respondents (63.9%) were aged 46-65years. The mean age was 56.94 ± 11.495 years. A higher proportion of the respondents were female (53.8%) while majority of them (74.1%) were married. About one-third of the respondents (36.4%) had secondary and tertiary levels of education while a few of them (12.0%) had no formal education. Most of the respondents (90.5%) were Christians and about one-fifth of them (20.9%) were civil servants, while a few of them (12.0%) were unemployed. **See table 1**.

About half of the respondents (48.8%) had high social support from family, friends and special persons, 40.5% had moderate support, while 10.8% had low social support. **See figure 1**.

About two-thirds of the respondents (70.9%) had low adherence, 19.6% of them had moderate adherence while 9.5% of them had high adherence. **See figure 2**.

Majority of the respondents with high adherence on the MMAS (71.4%) also had high support on the multidimensional social and family support scale. However, more of the respondents with low adherence on the MMAS had moderate support on the MDSPSS, and this association was found to be statistically significant. P= 0.001. **See table 2.**

Half of the respondents with low blood sugar (50.0%) had high support on the multidimensional social and family support scale, while 58.8% of those with high blood sugar had moderate support on the multidimensional social and family support scale, and this association was found not to be statistically significant. P=0.069. **See table 3.**

Half (50.0%) of the respondents whose duration of illness was less than 1 year had moderate and high support on the multidimensional social and family support scale, while all (100.0%) of those with illness duration 20 years and above had high support on the multidimensional social and family support scale, and this association was found not to be statistically significant. P =0.548. All of the respondents (100.0%) with obesity grade 3 had low support on the multidimensional social and family support scale, while about one-third of them with normal weight had high support on the multidimensional social and family support scale. This association was found to be statistically significant. P=0.005. More than half (57%) of respondents with regular clinic attendance had high support on the multidimensional social and family support scale and this association was found to be statistically significant. P=0.000. **See table 4.**

More of the respondents aged 26-45yeare (64.0%) had high support on the multidimensional social and family support as compared to those who were aged 66-85 years who had moderate support on the multidimensional social and family support scale. This association was not statistically significant. P=0.142. Majority of civil servants (68.2%) had moderate support while about one-third of the unemployed had high support on the multidimensional social and family support scale, and this association was found to be statistically significant. P=0.020. Majority of singles (80.0%) had high support, while all of those who were divorced (100.0%) had moderate support on the multidimensional social and family support scale. This association was found to be statistically significant. P= 0.002. **See table 5**.

3.1 Discussion

To the best of our knowledge, this may be one of the first few studies on social support and adherence to diabetic therapy in this part of Nigeria. The mean age of the participants in this study is 56.94±11.495years. This agrees with the observation by Linni et al [35] who got 57.23 years as the mean age in their study. A significant proportion, (two-thirds), of the participants in this study was between 46-65 years. This is similar to the observation in the study by Rasaq et al [36]. This finding supports the fact that chronic non-communicable diseases including hypertension and diabetes (especially type 2), are common from middle age adults who may largely be considered as vulnerable to cardiovascular and metabolic diseases [37]. Also these constitute a special population requiring various types of support [38,39]. This finding may also be attributed to the increased physical inactivity among this group with increased adoption of Western lifestyle, all contributing to rising incidence of chronic diseases, especially in adults above 40 years [37].

More of the respondents in this study (53.8%) were females. This is similar to the finding by Lilian et al (58%) [40] and Rasaq et al (63.5%) [36]. The female preponderance in this study may be attributed to the following reasons: Firstly, more females may have attended the clinic within the study period, rather than an increased prevalence of DM in females compared to males. Secondly, women tend to have better health seeking behaviour for chronic diseases than men [41]. Thirdly, in traditional African society, males are the major bread winners for their families and thus lacked the time to present themselves at the hospitals for screenings or follow-up. However, in another study by Linni et al [35], a male preponderance (52.3%) was found.

Most of the respondents in this study (48.8%) were found to have high social support from family, friends and special persons in their lives. This agrees with the observation by Lilian et al [40], but disagrees with the finding by Gillibrand et al [42] who revealed that social support in diabetic patients was not at an optimum level. Majority (70.9%) of the respondents had low adherence to diabetic therapy. This agrees with the finding in the study by Linni et al [35].However, this disagrees with the finding by Rasaq et al [36] where most of the participants had moderate adherence, and Lilian et al [40] where high adherence was recorded. Also other previous studies reported adherence rates ranging from 25 to 90% [43, 44, 45]. There is the need for more proactive measures in ensuring sustained improvement in therapy adherence and outcome among patients. Treatment non-adherence among patients on chronic medication including type 2 diabetes is a significant public health concern requiring stakeholders' attention [44,46]. Thus, combination of adherence enhancing intervention incorporating newer technological advancement, patient-centered care, as well as provision of expanded social support system may be necessary.It is well known that medication adherence is crucial to patients with diabetes in the controlling of blood sugar. Higher rates of medication adherence can reduce the risk of known complications [47]. It is also easy to understand that medication adherence, as self management, can significantly influence glycemic control. Poor medication adherence will result in bad glycemic control of the blood glucose level. There were also several factors , identified by previous studies, which influenced the medication adherence of patients with diabetes, such as multiple medicine taking, social and economic related factors, and therapy related factors [48].

Majority (71.4%) of respondents with high adherence to diabetic therapy were also found to have high perceived social support. The relationship between adherence to diabetic therapy and social support in this study was found to be significant. This agrees

with the finding by previous authors [35,40,49,50,51]. In a study conducted in Mexico on non –insulin dependent diabetes mellitus,it was revealed that social support acted as the main determinant of compliance with treatment [48]. Another study also found that higher scores of social support resulted in high adherence to insulin administration in women with gestational diabetes [52]. Perceived and received social support is becoming important in the management of patients with diabetes; for one thing, it was related to the progress of a variety of diabetes complications [52]. Several studies suggested that individuals with more supportive families or friends recovered faster than those who less socially integrated [53]. Lack of social support resulted in maladaptive responses to diabetes, further weakening the fighting spirit of diabetic patients. Additionally, social support was always related to subjective well-being [54]; once patients perceived and received social support from outsiders, they feel they are concerned about, accepted and appreciated, and cared for by other individuals, and their subjective well-being will be quickly increased; they would therefore take a positive attitude to their chronic diseases.
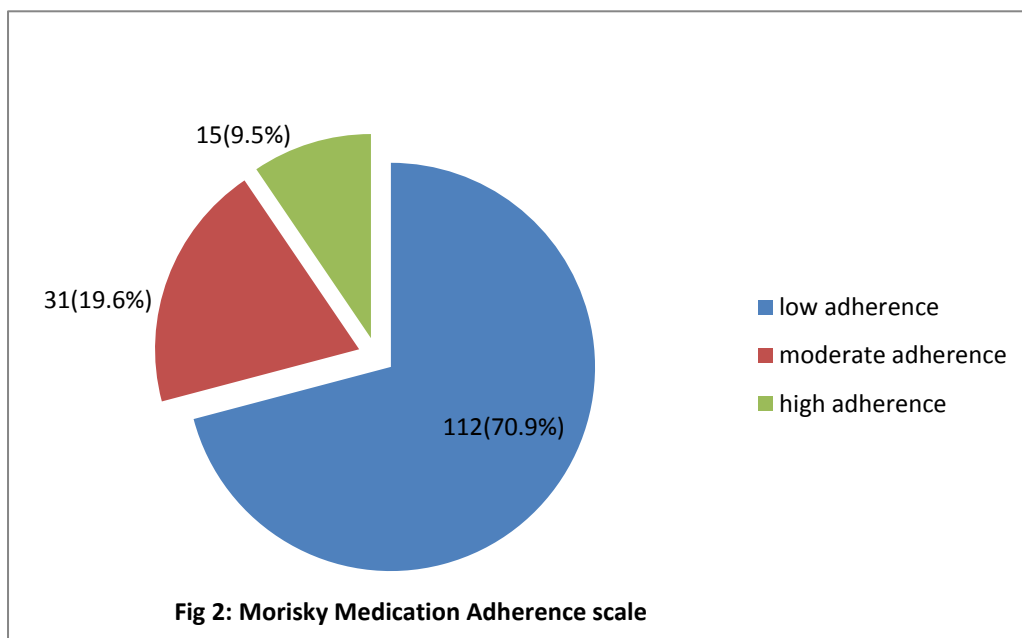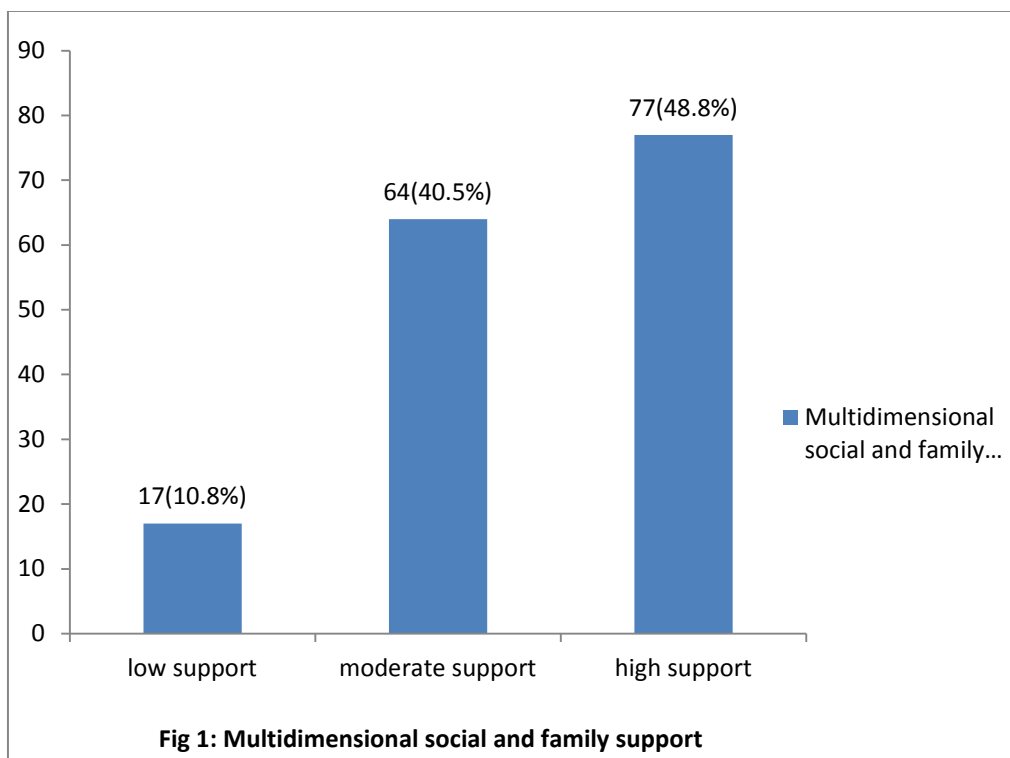
Most of the respondents with normal blood sugar level (58.2%), and half (50%) of those with low blood sugar level were found to have high social support. This was in line with the findings by other authors in their various studies [35,36,40]. However, the association between blood glucose level and social support was not significant in this study. This agrees with the finding in a previous study [40]. Metabolic control is a complex set of interactions, in which adherence is only one of the many related factors, and that is why its use as an adherence measure is of limited value [55].

4. CONCLUSION

It is clear (from this study and previous studies), that the influence of social/family support on diabetic therapy is significantly positive. The findings indicated that social support plays a crucial role in improving medication adherence in patients with DM. This means that patients with DM need to open their minds by gaining help from friends, relatives and other organizations. In the treatment process, family members play a major role, which requires them to establish a supportive environment and amend supportive behavior in improving patient's medication adherence, such as reminding patients to take medicine on time, supervising a healthy diabetic diet, etc.

Table 1: Socio-demographic Characteristics of Respondents

Variables	Frequency, n=158	Percent
Age group		
26-45	25	15.8
46-65	101	63.9
66-85	32	20.3
Sex		
Male	73	46.2
Female	85	53.8
Marital status		
Married	117	74.1
Single	5	3.2
Divorced	2	1.3
Separated	4	2.5
Widowed	30	19.0
Educational level		
No formal	19	12.0
Primary	27	17.1
Secondary	56	36.4
Tertiary	56	36.4
Religion		
Christian	143	90.5
Muslim	13	8.2
African traditional religion	2	1.3
Occupation		
Unemployed	19	12.0
Artisan	11	7.0
Civil servant	33	20.9
Business	53	33.5
Retired	42	26.6

Fig 1: Multidimensional social and family support

Fig 2: Morisky Medication Adherence scale

Table 2: MMAS and MDSPSS

MMAS	Multidimensional family/social support			Total
	Low support	Moderate support	High support	
Low adherence	17(15.9%)	52(48.6%)	38(35.5%)	107(100.0%)
Medium adherence	0(0.0%)	8(27.6%)	21(72.4%)	29(100.0%)
High adherence	0(0.0%)	4(28.6%)	10(71.4%)	14(100.0%)
Chi square = 18.836, p = 0.001				

Table 3: Fasting blood sugar and Multidimensional Social/Family support

FBS		MDSPSS		
	Low support	**Moderate support**	**High support**	**Total**
Low blood sugar	1(16.7%)	2(33.3%)	3(50.0%)	6(100.0%)
Normal blood sugar	6(9.0%)	22(32.8%)	39(58.2%)	67(100.0%)
High blood sugar	7(13.7%)	30(58.8%)	14(27.5%)	51(100.0%)
Chi square = 11.709, p = 0.069				

Table 4:DM duration, Obesity, Clinic attendance and MDSPSS

Variables	MDSPSS			Test	P value
DM duration	Low support	Moderate support	High support		
<1 year	0(0.0%)	1(50.0%)	1(50.0%)		
1-9 yrs	12(10.8%)	47(42.3%)	52(46.9%)	Fischers	
10-19yrs	5(15.6%)	15(46.9%)	12(37.5%)	al4.971	0.548
≥20yrs	0(0.0%)	0(0.0%)	3(100.0%)		
BMI					
Normal	11(22.9%)	19(39.6%)	18(37.5%)		
Overweight	4(5.6%)	29(40.8%)	38(53.5%)	Fischers	
Obesity grade 1	0(0.0%)	13(56.5%)	10(43.5%)	22.233	0.005
Obesity grade 2	0(0.0%)	1(33.3%)	2(66.7%)		
Obesity grade 3	1(100.0%)	0(0.0%)	0(0.0%)		
Regular clinic attendance					
Yes	10(9.4%)	35(33.0%)	61(57.5%)	χ^2	
No	7(16.7%)	27(64.3%)	8(19.0%)	20.697	0.000

Table 5: Socio-demographic characteristics and MDSPSS

Variables	MDSPSS			Test	p-value
Age group	Low support	Moderate support	High support		
26-45	1(4.0%)	8(32.0%)	16(64.0%)	$\chi^2=$	
46-65	10(10.5%)	42(44.2%)	43(45.2%)	6.880	0.142
66-85	6(20.0%)	14(46.7%)	10(33.3%)		
Occupation					
Unemployed	4(21.1%)	9(47.4%)	6(31.6%)		
Artisan	0(0.0%)	5(45.5%)	6(54.5%)	Fisher's	

Civil servant	1(4.5%)	15(68.2%)	6(27.3%)	18.206	0.020
Business	2(3.9%)	22(43.1%)	27(52.9%)		
Retired	10(27.0%)	13(35.1%)	14(37.8%)		
Educational level					
No formal	4(21.1%)	8(42.1%)	7(36.8%)		
Primary	1(4.0%)	17(68.0%)	7(28.0%)	$\chi^2=$	
secondary	6(11.1%)	26(48.2%)	22(40.7%)	16.599	0.011
Tertiary	6(11.5%)	13(21.2%)	33(63.5%)		
Marital status					
Married	7(6.3%)	47(42.3%)	57(51.4%)		
Single	0(0.0%)	1(20.0%)	4(80.0%)	Fisher's	
Divorced	0(0.0%)	2(100.0%)	0(0.0%)	24.383	0.002
Separated	1(25.0%)	3(75.0%)	0(0.0%)		
Widowed	9(32.1%)	11(39.3%)	8(28.6%)		

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