

## The Influence of Socio-Demographic Characteristics on Caregivers' Burden and Quality Of Life of Elderly Diabetics Attending a Nigerian Tertiary Hospital

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### Abstract

**Background:** Caregivers' burden and health-related quality-of-life (HRQoL) associated with Diabetes Mellitus (DM) are affected by several factors, including socio-demographic characteristics of the patients and their caregivers. Unfortunately, studies evaluating the influence of socio-demographic characteristics on caregivers and patients with DM in this environment are limited. This study therefore aimed at assessing the level of the burden imposed on the primary caregivers, the level of HRQoL of Individuals with Diabetes Mellitus (IDM) and the influence of socio-demographic characteristics on these variables among IDM attending the Family Medicine clinic of Wesley Guild Hospital, Ilesa, Osun State, Nigeria.

**Methodology:** Seventy-eight consenting IDM and their corresponding primary caregivers were recruited over 13-weeks in this hospital-based cross-sectional descriptive study. The Well-Being Questionnaire and Zarit Burden Interview were administered on IDM and their corresponding caregivers to assess HRQoL and burden of care. Data were analysed on SPSS 17 using descriptive statistics and Pearson chi-square test at  $p < 0.05$ .

**Results:** Mean ages of respondents were  $70.4 \pm 6.33$  and  $23.7 \pm 7.58$  years for diabetics and caregivers, respectively. The majority of the diabetic respondents were females (61.5%), married (66.7%), and retired (64.1%). The majority of the caregivers were females (87.2%), petty traders/students (71.8%) and unmarried (87.2%). Over half (51.3%) of the diabetic respondents and their caregivers had 'good' HRQoL and 'high' caregivers' burden.

**Conclusion:** The caregiver being a female, having primary education, being single and having a nuclear family relation of the IDM influenced good HRQoL, whereas being a low-income earner and an uneducated IDM influenced high caregivers' burden.

**Keywords:** Caregivers; Burden; Quality-of-Life; Elderly; Diabetics.

### Introduction

Diabetes Mellitus (DM) is associated with considerable functional impairment and reduced Health-related quality of life (HRQoL) in the older population. It imposes an increasing socioeconomic burden on informal caregivers who expend substantial energy and time for caring<sup>[1-3]</sup>.

Caregivers' burden and HRQoL may be affected by several factors during the care for the patients<sup>[4]</sup>. Unfortunately, few studies have explored the

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influence of socio-demographic characteristics on caregivers and elderly individuals with DM(IDM) in Nigeria. This study investigated the impact of socio-demographic factors on caregivers' burden and HRQoL of IDM attending the Family Medicine Clinic of a Nigerian tertiary health institution.

## Materials and Methods – Reorder the sections with ethics coming towards the end of the methodology

### Ethics

The research protocol was approved by the Ethics and Research Committee of the Obafemi Awolowo University Teaching Hospital, Ile Ife. Furthermore, written informed consent was obtained from each participant before data collection.

### Study Design

#### Respondents

The study was a hospital-based, cross-sectional descriptive study conducted in the Family Medicine clinic of WGH. Seventy-eight pairs of IDM and their respective primary caregivers were consecutively recruited as they became available over 13 weeks. Respondents included people with diabetes aged 60 years and above who had attended the dedicated diabetic clinic run by the Family Medicine unit for one year or more and their primary caregivers aged 18 years and above. Acutely ill diabetic patients were excluded from the study.

The Well-Being Questionnaire (W-BQ22): The W-BQ22 is a 22-item diabetic specific scale scored on a Likert scale from 0 ("not at all") to 3 ("all the time"). It is divided into depression, anxiety, energy and positive well-being subscales. The General Well-Being (GWB) score, that is; the total score is 66 while the mean (normative) score is 57. Scores equalled to or above the norm reflect good HRQoL, while scores below the standard represent poor HRQoL. The instrument has been validated among Nigerians<sup>[5,6]</sup>.

The Zarit Burden Interview (ZBI): The ZBI is a 22-item inventory that examines the burden associated with functional and behavioural impairments and the home care situation. Each question is scored on a 5-point Likert scale from 0 ('never') to 4 ('nearly always'). Items scores are added up to give a total score ranging from 0 to 88.<sup>[7]</sup> The normative score is

21. Scores equalled to or above the norm depict a high burden of care, while scores below the norm depict a low burden of care. The validity and reliability of ZBI have been established amongst Nigerians<sup>[8]</sup>.

### Procedure

Structured interviewer-administered questionnaires were used to obtain demographic data from diabetics and their caregivers. The WBQ and ZBI were administered to IDM and their corresponding caregivers, respectively, via face to face interview with paper and pen at the clinic by a trained research assistant.

### Data Analysis

Data were analysed using Statistical Package for Social Sciences version 17. Data were presented as means  $\pm$  SD and percentages and charts as appropriate. Means for continuous variables were compared using independent t-test, while categorical variables were compared using the Chi-square test. Level of significance was set at  $p < 0.05$  and the Confidence Interval (CI) of 95%.

### Results

The mean age of IDM was  $70.4 \pm 6.33$  years. The mean duration of diabetes was  $11.77 \pm 7.59$  years. Most of the respondents were in the age range 70-74 years (26.9%), females (61.5%), married (66.7%), had tertiary education (51.3%), and were retired (51.3%). Forty-nine (62.8%) of the respondents lived on more significant than the national minimum wage of ₦18, 000 per month. The socio-demographic characteristics of IDM are shown in Table 1. Table 2 summarizes the socio-demographic characteristics of caregivers. They comprised 68 (87.2%) female and 10 (12.8%) male participants. Their ages ranged from 18 to 67 years with a mean of  $23.7 \pm 7.58$  years. The age range 20-24 years (57.7%) was mostly involved with caregiving. The majority of caregivers had secondary education (53.8%), were single (87.2%), were Yoruba (87.2%), and were nuclear family members (47.4%) of the elderly diabetic participants. Also, about a quarter (27%) of the respondents were non-related individuals. Fifty-nine per cent (46) of the respondents had been diabetic for ten years or more. Also, equal proportions ( $n=39$ , 50%) of the respondents had excellent and poor glycaemic

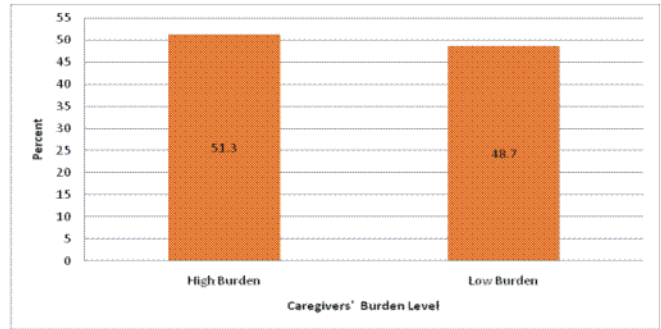
control. Seventy of the IDM (89.7%) were on treatment with Oral Hypoglycaemic Agent (OHA), and only 29.5% were within the normal range of Body Mass Index (BMI).

**Table 1:** Socio-demographic Characteristics of Elderly Individuals with Diabetes

Demographic characteristics	Frequency (n)	Percentage (%)	Minimum	Maximum	Mean(±SD)
<b>AGE GROUP(years)</b>			60	83	70.4(6.33)
60-64	18	23.1			
65-69	16	20.5			
70-74	21	26.9			
75-79	15	19.2			
80-84	8	10.3			
<b>SEX</b>					
Male	30	38.5			
Female	48	61.5			
<b>RELIGION</b>					
Christianity	69	88.5			
Islam	9	11.5			
<b>MARITAL STATUS</b>					
Single	-	-			
Married	52	66.7			
Separated	-	-			
Divorced	1	1.3			
Widowed	25	32.0			
<b>EDUCATIONAL LEVEL</b>					
Tertiary	40	51.3			
Secondary	14	17.9			
Primary	10	12.9			
No education	14	17.9			
<b>OCCUPATION</b>					
professional/businessman	3	3.8			
middle-level bureaucrat	4	5.1			
unskilled					
worker/trader/labourer	21	27.0			
Retired	50	64.1			
<b>INCOME</b>			5000	100000	31 474.36 (22 539.85)
< ₦18,000	29	37.2			
≥ ₦18,000	49	62.8			

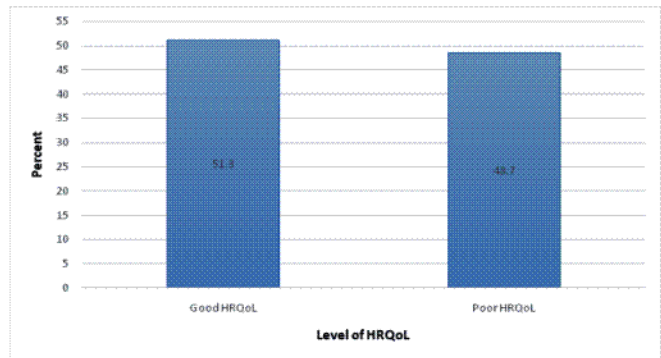
**Table 2:** Socio-demographic Characteristics of Caregivers

Demographic characteristic	Frequency (N = 78)	Percentage (%)
<b>AGE GROUP (years)</b>		
15-19	12	15.4
20-24	45	57.7
25-29	14	17.9
30-34	4	5.1
35-39	1	1.3
40-44	-	-
45-49	-	-
50-54	-	-
55-59	-	-
60-64	1	1.3
65-69	1	1.3
<b>SEX</b>		
Male	10	12.8
Female	68	87.2
<b>RELIGION</b>		
Christianity	69	88.5
Islam	9	11.5
<b>TRIBE</b>		
Yoruba	68	87.2
Others	10	12.8
<b>LEVEL OF EDUCATION</b>		
Tertiary	22	28.2
Secondary	42	53.8
Primary	11	14.1
No education	3	3.9
<b>MARITAL STATUS</b>		
Single	68	87.2
Married	10	12.8
Separated	-	-
Divorced	-	-
Widowed	-	-
<b>OCCUPATION</b>		
Artisan/skilled technician	2	2.5
Small scale trader	28	35.9
Students	28	35.9
House helps	20	25.7
<b>RELATIONSHIP</b>		
Nuclear	37	47.4
Extended	20	25.6
Non-related	21	27.0



**Figure 1:** Pattern of Caregivers' Burden of Caregivers of IDM

Figure 1 shows that a slight majority (51.3%, 40) of the respondents experienced high caregivers' burden, while the rest (48.7%, n=38) experienced low caregivers' burden.



**Figure 2:** Pattern of Health-Related Quality of Life of IDM

Figure 2 shows that a slight majority (n=40, 51.3%) of the respondents had a good HRQoL while the rest (n=38, 48.7%) had poor HRQoL.

**Table 3:** Association between caregivers' burden and demographic characteristics of elderly individuals with diabetes

Demographic characteristics	Caregivers' Burden		Total %	χ <sup>2</sup>	p-value
	High (%)	Low (%)			
<b>SEX</b>					
Male	13(43.3)	17(56.7)	30(100)	1.23	0.27
Female	27(56.2)	21(43.8)	48(100)		
<b>RELIGION</b>					
Christianity	34(49.3)	35(50.7)	69(100)	0.48	
Islam	6(66.7)	3(33.3)	9(100)		
<b>MARITAL STATUS</b>					
Married	26(50.0)	26(50.0)	52(100)	1.38	0.50
Divorced	1(100.0)	0(0.0)	1(100)		
Widowed	13(52.0)	12(48.0)	25(100)		
<b>OCCUPATION</b>					
Professional	0(0.0)	3(100.0)	3(100)	7.95	0.09
Middle level	1(25.0)	3(75.0)	4(100)		
Unskilled	14(66.7)	7(33.3)	21(100)		
Retired	25(50.0)	25(50.0)	50(100)		
<b>EDUCATIONAL LEVEL</b>					
Educated	28(43.7)	36(56.3)	64(100)	8.10	0.001*
Not educated	12(85.7)	2(14.3)	14(100)		
<b>INCOME</b>					
High	20(40.8)	29(59.2)	49(100)	5.78	0.02*
Low	20(69.0)	9(31.0)	29(100)		

Key: χ<sup>2</sup>- Pearson chi-square; FE- Fisher's exact; \*statistical significance; LR-likelihood ratio

Table 3 describes the cross-tabulation of caregivers' burden by socio-demographic characteristics of the IDM. This showed that being a low-income earner and an uneducated diabetic (p= 0.01) was statistically significant with high caregivers burden.

**Table 4:** Relationship between Caregivers' burden and the demographic characteristics of caregivers

Demographic characteristics	High burden n=40	Low burden n=38	Total (%) N=78	$\chi^2$	p-value
<b>SEX</b>					
Male	5(50.0)	5(50.0)	10(100.0)	0.008	0.931
Female	35(51.5)	33(49.5)	68(100.0)		
<b>AGE</b>				5.467	0.485 <sup>LR</sup>
15-19	6(50.0)	6(50.0)	12(100.0)		
20-24	21(46.7)	24(53.3)	45(100.0)		
25-29	8(57.1)	6(42.9)	14(100.0)		
30-34	2(50)	2(50)	4(100)		
35-39	1(100)	0(0)	1(100)		
60-64	1(100)	0(0)	1(100)		
65-69	1(100)	0(0)	1(100)		
<b>TRIBE</b>				0.008	0.931
Yoruba	35(51.5)	33(48.5)	68(100.0)		
Others	5(50.0)	5(50.0)	10(100.0)		
<b>RELIGION</b>				0.432	0.165
Christianity	33(47.8)	36(52.2)	69(100.0)		
Islam	4(44.4)	5(54.6)	9(100.0)		
<b>EDUCATIONAL LEVEL</b>				1.378	0.711
Tertiary	12(54.5)	10(45.5)	22(100.0)		
Secondary	22(52.4)	20(47.6)	42(100.0)		
Primary	4(36.4)	7(63.6)	11(100)		
No Education	2(66.7)	1(33.3)	3(100)		
<b>MARITAL STATUS</b>				1.609	0.205
Single	33(48.5)	35(51.5)	68(100.0)		
Married	7(70.0)	3(30.0)	10(100.0)		
<b>OCCUPATION</b>				2.827	0.418
Artisan	1(50.0)	1(50.0)	2(100.0)		
Small trader	14(50.0)	14(50.0)	28(100.0)		
Student	15(53.6)	13(46.4)	28(100.0)		
House help	10(50.0)	10(50.0)	20(100.0)		
<b>RELATIONSHIP</b>				8.230	0.021*
Nuclear	7(23.3)	30(76.7)	37(100.0)		
Extended	16(80.0)	4(20.0)	20(100.0)		
Non-related	18(85.7)	3(14.3)	21(100.0)		

Key:  $\chi^2$ - Chi-square; FE- Fisher's exact; LR-likelihood ratio; \*statistical significance.

Table 5 describes the cross-tabulation between caregivers' burden and the socio-demographic characteristics of caregivers. This showed that being a non-related caregiver was statistically significant with caregivers' burden (p= 0.021).

**Table 5:** Relationship between HRQoL of Elderly Individuals with Diabetes and demographic characteristics of caregivers

Demographic characteristics	HRQoL Good (%) n=40	Poor (%) n=38	Total (%)	$\chi^2$	p-value
<b>SEX</b>					
Male	2(20.0)	8(80.0)	10(100)		
Female	38(55.8)	30(44.2)	68(100)	0.02 <sup>FE*</sup>	
<b>AGE</b>				11.21	0.08
15-19	6 (50.0)	6(50.0)	12(100)		
20-24	25 (55.5)	20(44.5)	45(100)		
25-29	8(57.1)	6 (42.9)	14(100)		
30-34	0(0)	4(100)	4(100)		
35-39	0(0)	1(100)	1(100)		
60-64	0(0)	1(100)	1(100)		
65-69	1(100)	0(0)	1(100)		
<b>TRIBE</b>				0.35	0.56
Yoruba	34(50.0)	34(50)	68(100)		
Others	6(60.0)	4(40.0)	10(100)		
<b>EDUCATIONAL LEVEL</b>				9.05	0.03*
Tertiary	12(54.5)	10(45.5)	22(100)		
Secondary	20(47.6)	22(52.4)	42(100)		
Primary	8(72.7)	3(27.3)	11(100)		
No education	0(0)	3(100)	3(100)		
<b>OCCUPATION</b>				2.67	0.45
Artisan	2(100)	0(0)	2(100)		
Small trader	14(50.0)	14(50.0)	28(100)		
Students	16(57.1)	12(42.9)	28(100)		
House-help	8(40.0)	12(60.0)	20(100)		
<b>MARITAL STATUS</b>				5.13	0.02*
Single	38(55.8)	30(44.2)	68(100)		
Married	2(20.0)	8(80.0)	10(100)		
<b>RELATIONSHIP</b>				8.58	0.01*
Nuclear	25(67.6)	12(32.4)	37(100)		
Extended	9 (45.0)	11(55.0)	20(100)		
Non-Related	6(28.6)	15(71.4)	21(100)		

Key:  $\chi^2$ - Chi-square; \*statistical significance.

Table 5 describes the cross-tabulation between HRQoL of IDM and demographic characteristics of caregivers. It shows that the caregiver being a female, having primary education, being single, and having a nuclear family relation of the IDM were significantly associated with good HRQoL of IDM.

**Table 6:** Relationship between HRQoL and Demographic/Clinical Characteristics of Elderly Individuals with Diabetes

Demographic Characteristics	HRQoL		Total	$\chi^2$	p-value
	Good (%)	Poor (%)			
<b>SEX</b>					
Male	20(66.7)	10(33.3)	30(100)	3.888	0.04*
Female	20(41.7)	28(58.3)	48(100)		
<b>AGE</b>				1.987	0.74
60-64	8(44.4)	10(55.6)	18(100)		
65-69	9(56.3)	7(43.7)	16(100)		
70-74	10(47.6)	11(52.4)	21(100)		
75-79	9(60.0)	6(40.0)	15(100)		
80-84	4(50.0)	4(50.0)	8(100)		
<b>INCOME</b>				3.294	0.07
High	29(59.2)	20(40.8)	49(100)		
Low	11(37.9)	18(62.1)	29(100)		
<b>MARITAL STATUS</b>				1.915	0.38
Married	28(55.8)	24(44.2)	52(100)		
Divorced	0(50.0)	1(50.0)	1(100)		
Widowed	12(48.0)	13(52.0)	25(100)		
<b>OCCUPATION</b>				6.881	0.14
Professional	2(66.7)	1(33.3)	3(100)		
Middle level	1(25.0)	3(75.0)	4(100)		
Unskilled	7(33.3)	14(66.7)	21(100)		
Retired	30(60.0)	20(40.0)	50(100)		
<b>EDUCATIONAL LEVEL</b>				17.154	0.01*
Tertiary	30(75.0)	10(25.0)	40(100)		
Secondary	4(28.6)	10(71.4)	14(100)		
Primary	2(20.0)	8(80.0)	10(100)		
No education	4(28.6)	10(71.4)	14(100)		
<b>DURATION of DM</b>				0.802	0.37
< 10 years	18(56.3)	14(43.4)	32(100)		
≥ 10 years	12(26.1)	34(73.9)	46(100)		
<b>BMI</b>				1.080	0.58
Normal	15(65.2)	8(34.8)	23(100)		
Overweight	16(50.0)	16(50.0)	32(100)		
Obese	9(39.1)	14(60.9)	23(100)		
<b>GLYCAEMIC CONTROL (HbA1c %)</b>				0.463	0.50
< 7(Good)	22(56.4)	17(43.6)	39(100)		
≥ 7(Poor)	18(46.2)	21(53.8)	39(100)		

Key:  $\chi^2$ - Chi-square; \*statistical significance.

Table 6 describes the cross-tabulation between HRQoL and demographic characteristics of IDM. It shows that being male (p=0.04) and tertiary education status (0.01) were statistically significant.

**Discussion**

Various studies from different parts of Nigeria and other African countries on diabetes have reported varying mean ages of participants.<sup>[5, 9, 10]</sup> The mean age of diabetic respondents reported in this study is comparably higher than in the aforementioned studies. This may be attributed to the fact that this study was delimited to only IDM aged 60 years and above, whereas the others involved the entire spectra of adult diabetics. More female IDM reported in this study is similar to findings in other

parts of Nigeria.<sup>[9, 11]</sup> This could be because women are more likely to seek medical attention than their male counterparts, who may be more preoccupied with economic activities. Also, females are expected to be more in this age group of study due to the higher female life expectancy in Nigeria of 56 years compared to males, which was put at 53 years by WHO in 2015.<sup>[1]</sup> The reported mean ages of caregivers vary in previous studies from different parts of the world<sup>[13, 14, 15]</sup>. These studies also reported a higher percentage of females among the caregivers than males, similar to our study. The educated majority of caregivers reported in this study is consistent with some earlier reports<sup>[8, 1]</sup> but much higher than others<sup>[14, 17]</sup> and lower than the finding by Zergaw et al.<sup>[13]</sup>

The unmarried majority of caregivers in this study differs from the married majority of caregivers reported in earlier studies<sup>[1, 1]</sup>. The mean ages of respondents in those studies are similar and comparably higher than in this study and might have accounted for their being married. Nuclear family majority of the caregivers in this study is however lower than a previous study<sup>[8, 17]</sup>, perhaps on account of the greater caregiver burden involved in the neuropsychiatric conditions concerned and the need for greater involvement of emotionally-related family members in the care of such disorders.<sup>[8, 13, 17]</sup> Half of the caregivers in this study are petty traders or artisans in addition to the caregiving role they perform. Some authors reported a substantial percentage of caregivers as being employed in addition to their caregiving role<sup>[8, 13, 17]</sup>. This implies that the caregiving role can be combined with other less demanding occupations, which may serve as an impetus for the better performance of such roles.

Low income earning and non-educated IDM significant association with the caregivers' burden in our study are consistent with previous research findings. Low income is linked to poorer health behaviour and outcome.<sup>[18]</sup> Lack of suitable materials, medication, and human resources to provide health care might impose burdens on the caregiver. Education is known to positively influence health behaviour and outcome.<sup>[18]</sup> Not being educated, on the other hand might make communication and adherence with medication or

other health-promoting measures difficult. These might also indirectly constitute burdens on the caregivers as revealed in this study. Education leads to better health behaviour and outcome through health literacy, making an individual understand basic health information and services needed to make appropriate health decisions.

A slight majority of the IDM in this study had a good HRQoL, while about half had poor HRQoL. This is slightly different from the study of Fatusin<sup>[9]</sup> and the reports of Issa and Baiyewu<sup>[19]</sup>. The difference between the reported studies and this study lies mainly in the way each author classified quality of life. Whereas QoL was dichotomised into 'good' and 'poor' in this study, the quoted studies classified QoL into 'good', 'fair' and 'poor' based on the tool employed for their studies. It is likely that the 'good' group in this study contain a share of the 'fair' group had it been included in the classification employed. Caregivers being female, not currently married, and being nuclear family relatives were significantly associated with good HRQoL of elderly diabetic participants. Single females have more time for other responsibilities such as performing caregiving roles since they may be free from family commitments. This might enable such female caregivers to be better dedicated to their caregiving role which might in turn impact positively on the QoL of the diabetic patients being cared for.

This study has some limitations that may need to be considered in interpreting and generalizing its findings. First, the study may have been subjected to recall bias as the respondents completed the questionnaires. Thus information provided, while they remain the fact upon which the study was based, may not be entirely true. Second, this study was hospital-based. Therefore, the findings may not be a true reflection of the relationship between community-based elderly diabetic patients and their caregivers. More research, preferably community-based and interventional, is required on caregivers' burden in diabetes management to improve patient care and generate data to influence policy changes. Areas of future research should include examining factors that are likely to lessen caregivers' burden, such as social support and other family-based interventions. Lastly, the study was cross-sectional in design. One can only establish a loose association

and not ascribe causation to any factors responsible for the outcome.

The level of caregivers' burden in the study sample was mild to moderate, and there was as much proportion of caregivers with burden as there were without. Similar proportions of elderly diabetic participants had good health-related quality as caregivers with burden, while participation of the nuclear family members contributed to good HRQoL of IDM. Caregiver being a female, having primary education, being single and having a nuclear family relation of the IDM were significantly associated with good HRQoL of IDM, whereas only being a low income earner and an uneducated diabetic are significantly associated with caregivers burden. The clinical implication of this is that attention should be paid to the burden of care borne by caregivers in the overall care of IDM in order to improve their clinical outcomes. It is therefore recommended that nuclear family members should be encouraged to partake more actively in the care of their elderly diabetic relatives. There is a need for further studies on the impediments to improved health-related quality of life of elderly diabetic clients as a significant proportion of them experience poor health-related quality of life.

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