

Gender difference in quarterly out of pocket expenditure on Diabetes care in Thoothukudi – a cross-sectional study.

Joy Patricia Pushparani¹, Gracy Paulin², Sudharshini Subramaniam³

Affiliation: 1 Professor & 3 Associate Professor, Institute of Community Medicine, Madras Medical College, Chennai. 2 Assistant Professor, Department of Community Medicine, Thoothukudi Medical College, Thoothukudi

Date of Submission : 16-03-2019

Date of online Publication : 27-05-2019

Date of Acceptance : 26-04-2019

Date of Print Publication : 30-06-2019

***Author for correspondence:** Dr. Sudharshini Subramaniam, MD, Associate Professor, Institute of Community Medicine, Madras Medical College, Chennai-03. Email id : sudharshini.subramaniam90@gmail.com

ABSTRACT

Background: Diabetes Mellitus is a long term disease which require higher medical expenditure. If inadequately treated or undiagnosed, it leads to multiple chronic complications, which again increase the expenditure multi-fold. Gender has got implications in diabetes care due to sex differences as well as that of social inequities entrenched within gender. This study is done to compare quarterly Out of Pocket expenditure (OOPE) on diabetes care with gender as a covariate. **Methods :** Quarterly OOPE is defined as any expenditure incurred by households as a payment to health practitioners and suppliers of pharmaceuticals, therapeutic appliances and other goods and services during the last three months due to diabetes. A cross sectional study was done in Thoothukudi Corporation among 180 diabetic patients using a semi structured questionnaire. **Results:** Among the study participants, 49.2% were males and 50.8% were females. The median quarterly OOPE for males was Rs.2387 with an interquartile range of Rs.2742 and that of females was Rs.1249.42 with an interquartile range of Rs.2836 which was statistically significant (p value < .001). The proportion of family monthly income spent on diabetes care was also significantly lower for women (2.6%) compared to men (4.48%). **Conclusion:** The quarterly OOP expenditure was significantly lower among women compared to men. In a country like India, where larger share of health expenditure is contributed through OOPE, this finding is revealing that gender equity in diabetes care is nowhere near its reach.

Key Words: out of pocket expenditure, gender, Diabetes, Inequity

INTRODUCTION

Gender inequity is a phenomenon which is well recognised in health and also in access to health care.¹⁻⁶ The prevalence of diabetes is increasing most rapidly among women. Also, women with diabetes are at increased risk of developing complications like coronary artery disease, kidney disease, blindness and depression than their male counterparts. Women also have the higher prevalence of risk factors of Diabetes like overweight, physical inactivity compared to men.⁷

Diabetes Mellitus is of concern not only because of the impact it creates physically, but also because it creates an impact on the emotional, psychological, social and economic aspects of the individual as well as that of their family.⁸⁻¹⁶ Diabetes Mellitus is a long term disease which requires higher medical expenditure.¹⁷ If inadequately treated or undiagnosed, it leads to multiple chronic complications, which again would increase the expenditure multifold.^{15,18} Diabetes which is called as a costly disease by United Nations, with weaker public health system in addition would warrant a higher out of pocket expenditure from the patients.¹⁷

Women's higher risk of getting diabetes and its complications, could not only be explained by the

biological differences, but also social structure plays a significant role.¹⁹ Gender has got implications in diabetes care, due to sex differences and the social inequities entrenched with gender. While studies have looked at various social covariates and diabetes outcomes as well as expenditure, gender has not been looked closely.^{20,21} Studying gender from close quarters would pave way for improving equity in diabetes care. Quarterly OOPE is defined as any expenditure incurred by households as a payment to health practitioners and suppliers of pharmaceuticals, therapeutic appliances and other goods and services due to diabetes in 3 months recall period. OOPE includes direct medical cost (money spent on consultation, investigation, medication, hospitalization, management and treatment of complications), direct non-medical cost (money spent on transport to health facilities and lifestyle modification) and indirect cost (income lost to the patient and caregiver due to absenteeism). The findings of this study will help in understanding gender inequity in OOPE and explore strategies to bring in parity. The objectives of this study is to study the gender difference in the quarterly OOPE and the factors influencing the difference.

This study is a sub study of another study which aimed at assessing the quarterly OOP expenditure incurred towards diabetes care.

METHODS

A community based cross sectional study to assess the out of pocket expenditure on diabetes care was conducted among people with diabetes mellitus in urban areas of Thoothukudi Corporation of Tamilnadu during April 2016 to June 2016. The district sex ratio is 1023, which is higher than Tamilnadu's sex ratio of 996. Thoothukudi had relatively lesser gender inequity if sex ratio were to be considered as a proxy measure of gender equity. The study population included diabetic patients, more than 18 years of age with at least 3 months elapsed since the diagnosis of the disease, residing in the selected wards of Thoothukudi corporation. Gestational Diabetes Mellitus and guests who were present in the house were excluded from the study. The operational definition for Diabetic patients was those who had a history/clinical record for "physician diagnosis of diabetes and/or current use of medications for diabetes (insulin or oral hypoglycaemic agents).

The sample size was calculated for the main study with the objective of estimating the OOPE. The Mean quarterly OOPE was estimated to be Rs.3208.99 and Standard deviation Rs.2095.90 based on a pilot study. Therefore for a 95% confidence level and 10% relative precision of estimate, the sample size calculated was 164. Allowing 10% non-response rate, total sample size required came around 180. The sampling for the study population was carried out as Multi stage sampling method. In the first stage, two zones were selected of the four zones randomly. In the second stage five wards were randomly chosen from the selected zones. In the selected wards, a street was randomly selected from the list of streets. Then a random direction from the centre of the street was randomly selected by a spin of a pen. The houses in that direction were visited till 18 diabetic patients were obtained. In each house, all individuals who were fulfilling the criteria of operational definition were selected for the study.

The study tool was a semi-structured interview-based questionnaire administered by the investigators which was validated with the help of experts and pilot study and necessary modification was done after the pilot study. The questionnaire included details on socio-demographic details, disease profile, diabetes treatment seeking behaviour, details of expenditure on diabetes care in 3 months recall period and coping mechanism for increasing health-care expenditure. To avoid recall bias, the study participants were given sufficient time to reflect and think before answering and the self-reported information was verified through proxy sources like medical records, prescription and lab reports, bills, medicine blister packs. Socio-economic classification was done according to B.G. Prasad Classification based on the Consumer Price Index of May 2016.²² Recent fasting and post-prandial blood glucose values taken during the past

three months were obtained from available clinical records. A person was said to be under good glycemic control if the FBS value was < 126g/dl and PPBS <200g/dl in the most recent laboratory investigation done within last 3 months. Individuals who did not have blood sugar values tested in the last 3 months were considered glycemic level unknown. The clinical and expenditure details collected from the participants were crosschecked with records and bills available at the time of visit. Among the study participants, anybody with history of hospitalisation had all the bills. Among others, bills were available for verification with nearly 40% of the participants. In case of unverifiable bills, self-reported expenditure was cross verified with the routine cost of medicine, lab investigations and consultation fee based on the market price.

Ethical approval for the study was obtained from the Institutional Ethics Committee. Information sheet was read to the individual and the purpose of the study was elaborated to the participants. After obtaining informed written consent from the individual, face to face interview was done based on the semi-structured questionnaire.

Analysis: Data was collected from 180 diabetic patients. Three individuals' data which was found to be incomplete and erroneous were excluded from the study. Thus the total study population accounted to 177 diabetic individuals. Data was analysed using Statistical Package for Software Solutions (SPSS) version 16. Due to the skewed distribution of the variables, the median values and interquartile ranges are reported. Median test was used for intergroup comparisons. Chi-square test was used for comparison of proportions.

RESULTS

Background characteristics:

Of the 177 patients interviewed, 87 were males (49.2%) and 90 were females (50.8%). From table 1, it is found that there is no significant difference in the background characteristics like age, religion and socio economic status between men and women. But there was a significant difference in the marital status, education level, occupation and financial dependency status. The findings of the demographic characteristics were as per the general patterns prevailing in the Indian society. While 70% of women were dependent on others for their finance, only 10% of men were dependent. There was no significant difference between males and females with regards to diabetes treatment seeking behaviour as shown in table 2. But with respect to the outcome, it is found that more women suffered from more than two complications and poor glycemic control.

Among the study population, the median quarterly OOPE for males was INR 2387 with an interquartile range of INR. 2742 and that of females was INR. 1249.42 with an interquartile range of INR.2836. Figure 1 shows a boxplot depicting the distribution of quarterly OOPE on diabetes among males and females.

Table 1. Background characteristics of the study population

Background characteristic	Male (n- 87)	Female (n -90)	p- value
Age in years [Mean (SD)] ¹	56.84(10.91)	56.18(10.78)	0.686
Age category			
n(%) ²			
	20-30 years	1(1.1%)	1(1.1%)
	31-40 years	6(6.9%)	6(6.7%)
	41-50 years	23(26.4%)	20(22.2%)
	51-60years	23(26.4%)	34(37.8%)
	61-70years	24(27.6%)	22(24.2%)
	71-80 years	9(10.3%)	5(5.6%)
	81-90 years	1(1.1%)	2(2.2%)
Marital status ²	Married	79(90.8%)	67(74.4%)
n(%)	Widow/widower	8(9.2%)	23(25.6%)
Religion ²	Hindu	69(79.3%)	74(82.2%)
n(%)	Muslim	3(3.4%)	2(2.2%)
	Christian	15(17.2%)	14(15.6%)
Educational status ²	Illiterate	0(0%)	5(5.6%)
n(%)	Primary & secondary school education	45(51.7%)	59(65.6%)
	High school & higher secondary	8(9.2%)	12(13.3%)
	Diploma and degree	34(39.1%)	14(15.6%)
Occupation ²	Unemployed	8(9.2%)	61(67.8%)
n(%)	Unskilled	5(5.7%)	5(5.6%)
	Semiskilled	12(13.8%)	4(4.4%)
	Skilled	28(32.2%)	4(4.4%)
	Professional	0(0.0%)	4(4.4%)
	Landlord	2(2.3%)	0(0%)
	Shop owner	10(11.5%)	1(1.1%)
Financial dependency status ²	Dependent	9(10.3%)	63(70.0%)
n(%)	Independent	78(89.7%)	27(30%)
Socio economic status ²	Class I	21(24.1%)	21(23.3%)
n(%)	Class II	41(47.1%)	49(54.4%)
	Class III	18(20.7%)	16(17.8%)
	Class IV	6(6.9%)	4(4.4%)
	Class V	1(1.1%)	0(0%)

1 – Independent Sample t test, 2 – chi square test , *- statistically significant at p value -0.05

There was a statistically significant difference in the quarterly OOPE on diabetes between men and women (Mann-Whitney U test, *P* 0.01). Among the study participants, 5 men (5.7%) and 5 women (5.6%) were hospitalised in the past 3 months. The reason for hospitalisation among men was myocardial infarction and diabetic ulcer and among women it was myocardial infarction, ulcer, nephropathy cataract and cerebrovascular Accident.

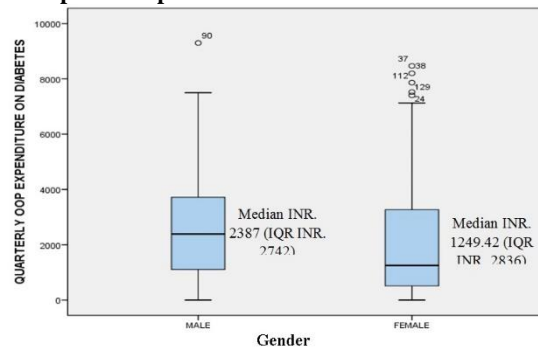


Figure 1 Boxplot showing quarterly OOPE on diabetes among male and females

Mann Whitney U test, statistically significant at p value <0.05

Table 2: Diabetes clinical Characteristics of the study participants

Clinical Characteristic	Male (n- 87)	Female (n -90)	p- value
Type of health sector from which Diabetes care is sought ²	Government	15(17.2%)	19(21.1%)
n(%)	Private	70(80.5%)	68(75.6%)
	Both	2(2.3%)	3(3.3%)
Diagnosis ¹	Incidental	65(74.7%)	71(78.9%)
n(%)	Voluntary	22(25.3%)	19(21.1%)
Duration of diabetes since diagnosis ²		6(12)	6.5(9)
Median years (IQR)			
No of comorbid conditions ¹	Nil	41(47.1%)	44(48.9%)
n(%)	1comorbid condition	29(33.3%)	31(34.4%)
	2comorbid conditions	17(19.5%)	12(13.3%)
	>2comorbid conditions	0	3(3.3%)
Complications ¹	No complications	50(57.5%)	67(74.4%)
n(%)	1 complication	36(41.4%)	20(22.2%)
	>1 complication	1(1.1%)	3(3.3%)
Glycemic control ¹	Not known	5(5.7%)	11(12.2%)
n(%)	Good control	52(59.8%)	30(33.3%)
	Poor control	30(34.5%)	49(54.4%)

1 – chi square test, 2 – Mann Whitney U test *- statistically significant at p value -0.05

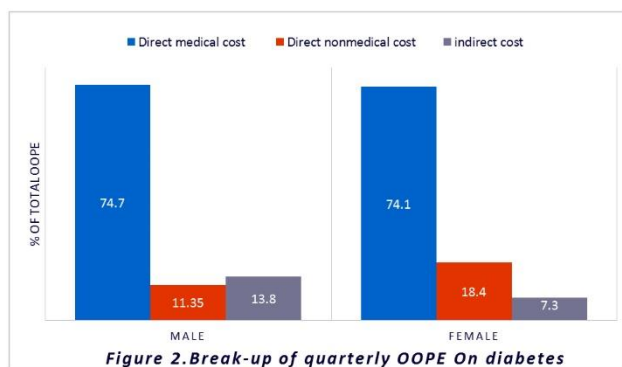
From figure 2, it is established that in both the sex, almost 3/4th of the total expenditure incurred is towards direct medical cost. But in absolute numbers, the median direct medical cost among men was Rs. 2000,(IQR -2630) and among women was Rs.1143.93(IQR – 2426) [Mann Whitney U test, *P* 0.063].Men had a higher proportion of expenditure incurred towards indirect cost, while women had spent towards direct non- medical cost which includes transportation and diet modification. Direct non-medical cost incurred among men was Rs.60(IQR -270) and women Rs. 50 (IQR – 180) [Mann Whitney U test, *P* 0.275). Proportion of monthly family income spent on diabetes for males was 4.48% (IQR – 6.34) whereas among females it was 2.6% (IQR – 6.24) which was

statistically significant as shown in figure 3. (Mann Whitney U test, *P* 0.014).

Table 3. Gender differences in quarterly OOP with relation to other socio-demographic factors.

Socio-demographic characteristic	Male	Female	P value	
	In INR. Median (IQR)	In INR. Median(IQR)		
Age category	31-40 years	1740(1549)	1170.30(1880)	0.818
	41-50 years	2190(4814)	1168.47(2178)	0.161
	51-60years	2727.78(4067)	1050.13(3583)	0.039*
	61-70years	3180(2075)	1592.5(3365)	0.272
	71-80 years	2498(4156)	3535 (16588)	0.797
Marital status	Married	2570(2894)	1248.83(2762)	0.012*
	Widow/widower	2205.72(1823)	1368.83(3177)	0.842
Financial dependence status	Dependent	2200(3233)	995.25(2441)	0.153
	Independent	2400.33(2784)	2030(2817)	0.781
Religion	Hindu	2498(3291)	1309.42(2821)	0.019*
	Muslim	1253.85(0)	4101.55(0)	0.8
	Christian	2270.2(2040)	940.04(2567)	0.186
	Illiterate	0	400(734)	
Education	Primary and secondary	1840(2477)	1235(2729)	0.355
	High school and higher secondary	2957(5330)	2153(4500)	0.427
	Diploma and degree	3117(3219)	1680.43(3819)	0.212
SES	Class I	3392(4707)	1701.15(7005)	0.263
	Class II	2570(2688)	1235(2342)	0.069
	Class III	2045(2191)	1176.92(1711)	0.081
	Class IV	781(1080)	557.5(4591)	0.762

Statistical test performed- Mann Whitney U test. *- statistically significant at p value <0.05



As shown in Table 3, there is an increase in the quarterly OOP spent on Diabetes with age up to 70 years of age among males. The gender difference is very evident in all the age groups, with a wider difference in the 51-60 age group. Among very old (71-80 years) females are spending more than the males. With regards to marital

status, when they are living together females tend to spend less than when they are alone, while the reverse is true in males. In either cases, females are spending less than the male counterparts. Similarly, women who are financially dependent on others spend only half of what independent women do, but the irony is irrespective of the financial dependence status, females spend less than what the males do. Religion wise, there is a gender difference among Hindus.

Table 4. Gender differences in quarterly OOP with relation to disease characteristics.

Disease characteristic	Male (INR)	Female(INR)	p value	
	Median(IQR)	Median(IQR)		
Hospitalisation	Yes	9300(51922)	39054(47049)	0.841
	No	2260(2421)	1193.86(2401)	0.007*
Duration of diabetes	< 1 year	1382.5(2636)	575(1316)	0.351
	1-5 years	1640(2043)	1088.11(1563)	0.188
	5-10 years	2721.8(3920)	1462.9(2273)	0.093
	10-20years	2743.6(2762)	2252.3(4386)	0.619
Mode of diagnosis	>20 years	3825(4184)	2240.2(4989)	0.22
	Incidental	2270.2(3613)	1248.8(2762)	0.010*
	Voluntary	2572.5(2867)	1376(4184)	0.583
Comorbidities	Nil	1570.9(2304)	930(1477)	0.086
	1 comorbidity	3305(4718)	1250(4533)	0.068
	2 comorbidity	3160(3175)	2629.28(5648)	0.444
Complications	>2 comorbidities		7403.1	
	No complications	1740(2253)	800(1269)	0.020*
	One complication	3325(4055)	2849(5040)	0.578
	>1 complication		8469	1
Health Service provider	Government	460(2130)	90(750)	0.8
	Private	2631.9(2653)	1597.5(3129)	0.43
	Both	4309.8	700	0.063
	Not known	513(1460)	513(895)	0.827
Glycemic control	Good control	2631.9(3807)	1680.4(2958)	0.368
	Poor control	2270.1(1860)	1248.8(3334)	0.040*

Statistical test performed- Mann Whitney U test. *- statistically significant at p value <0.05

With increasing education status, there was an increase in the amount spent on Diabetes among males. But the pattern was not similar among women. Irrespective of the level of education, the gender difference continued to exist. This was also true with regards to SES as well, wherein there was a larger gender difference among the well off. The gender difference was declining as one moves down the SES.

Table 5. Differences in the coping mechanisms adopted

Coping mechanisms	Male	Female
Loan	3(3.4%)	3(3.3%)
Company reimbursement	3(3.4%)	4(4.4%)
Medical insurance	8(9.2%)	3(3.3%)
Mortgage	3(3.4%)	1(1.1%)
Personal savings	69(79.3%)	79(87.8%)
Selling property	1(1.1%)	0(0%)

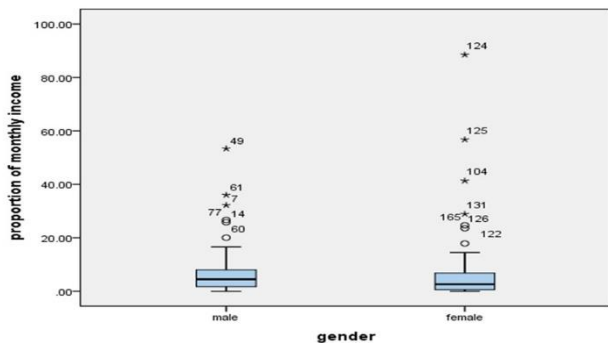


Figure 3. Gender difference in proportion of monthly income spent on Diabetes

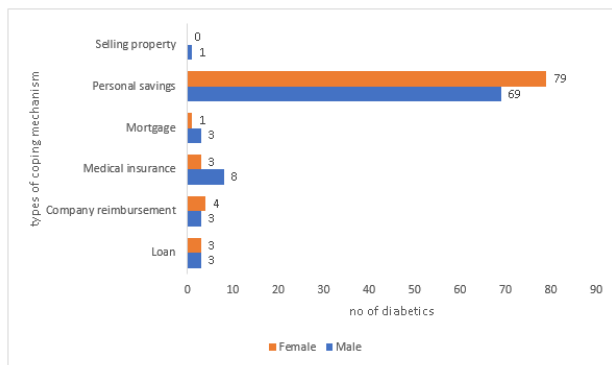


Figure 4: Differences in the coping mechanisms adopted

Among non-hospitalised patients, females are spending less than the males, which was statistically significant. With increase in duration of diabetes, the amount spent on diabetes increases in both the sexes, but the gender difference continues to persist. From table 4, it is also evident that gender difference continue to persist irrespective of the mode of diagnosis, type of health sector approached for diabetes care, number of comorbidities and complications present. With regards to glycemic control, there was no difference in the OOPE between men and women if their glycemic status was not known. But at the same time, there was a statistically significant difference in the quarterly OOPE incurred between men and women who had a poor glycemic control.

From table 5, it is evident that both the gender had to cope with the OOPE from the personal savings. While 9.2% of the males had the benefit of medical insurance, only 3.3% of the females had it.

DISCUSSION

There are various studies which had provided evidence for gender inequality in health and access to health care services.¹⁻⁶ While various studies has looked at difference in OOPE, across economic class and place of

residence, gender is often neglected.²³⁻²⁵ It is evident from this study, that there is a gender difference in quarterly out of pocket expenditure for diabetes care, where women spend almost only half of what their male counterparts do. In a Low Middle income country like India, where major contribution towards health expenditure is through OOPE, this finding carries a huge significance.²⁶ This is important in the context that 21.92% of the population in India are living below the poverty line.²⁷ Thoothukudi, where the present study is conducted can be considered as a district with lesser gender inequity by considering sex ratio as a proxy measure for inequity. But even in this district, it is evident from the study that women do not enjoy similar social status as what men do. Women lag behind men in terms of education, which has an effect on occupation and financial dependency status. In all these factors women were at a disadvantaged position than men.

Gender difference in OOPE is not unique to Thoothukudi district or to diabetes. A study was done to assess the gender difference in Health care expenditure towards different morbidity using two rounds of the longitudinal, nationally representative survey known as the India Human Development Survey (IHDS), - IHDS 1 (2004-2005) and IHDS 2(2012-13).It was found that irrespective of the type of morbidity and survey rounds, females spent lesser than males.^{28,29} A secondary data analysis of the National Sample Survey Organization (NSSO) data of the 55th (1999-2000) and the 64th (2007-2008) rounds also showed that higher amount is spent on elderly males for health and food than on elderly females in all regions of India. Though the health expenditure on the elderly women had increased from the first to the second survey period, a huge disparity was still seen between the two gender.³⁰The scenario in developed countries is a little different wherein females spend high OOPE compared to males.^{31,32} But that doesn't mean these countries are progressive in terms of gender equity, as in developed countries most of the health expenditure is borne by mechanisms other than OOPE.³³ In such a context, women spending higher OOPE males is a grave sign of gender inequity despite economic progress.

In the present study, it is found that the gender difference was the highest among the richest economic class and the least among the poorest class. Similar finding was also found in other studies, which showed the gender difference in health care expenditure was seven times higher among the richest quintile compared to the lowest quintile.^{28,29}

The gender difference is seen across all age group, education status and economic class. Illiteracy level was high among women and majority of the women in the study group were unemployed. This could contribute to the gender difference in the outcome of the disease as uneducated, unemployed people with diabetes who cannot afford or do not have access to even minimum healthcare facilities are likely to be diagnosed late. They are at increased risk of developing diabetes related

complications due to delays in diagnosis and/or improper treatment.²¹

It is important to note that 70% of the women who participated in the study are financially dependent on some body, whereas only 10.3% of the men were dependent. The gender difference in OOPE towards diabetes care is further perpetuated by the financial dependency status. The sequelae of this financial dependence is that they have little say in decision making. This is evident from the gender difference in proportion of monthly family income being spent towards diabetes care, while men spend 4%, women spend only 2% on an average. It is also evident from the study, even among financially independent women, the median quarterly OOPE incurred by women is less than that of the men. It is spelled by different studies that utilisation of health care by women is mediated by their role in decision making and resource allocation within households. It is also found that a woman is more likely to be included in the decision making process provided she earns more or as equal to that of her husband.^{28,34} These findings clearly point out that women due to lack of access to paid employment, irrespective of her education status due to the social norm of engaging in household work which is yet not accounted for economic outcome and less say in decision making process in the family, tend to spend less for their health, delaying or not utilising the health care facility.

It is well established that OOPE acts as a barrier to access health care. The socio-economic disadvantages faced by the women further amplifies the risk of developing worse outcomes of the disease, who are already at greater risk of developing the disease and the complications compared to men. Gender disparity in OOPE cannot be considered as a random occurrence and dismissed, for it has an impact on the outcome of the disease. It is evident from the study that women spend less than men and also larger proportion of women suffer from poor glycemic control than men. Lower spending on diabetes care could be a causal effect of poor glycemic control. Studies had established that OOPE prevent more women than men from utilising essential health services.³⁴ Studies have also shown that patients tend to forego medicines depending on their ability to pay.³⁵⁻³⁷

The gender difference in OOPE is prominent if there was no hospitalisation. Among hospitalised there is no gender difference. The vulnerable by cutting the cost on primary and secondary prevention, tend to bear higher cost at a later stage due to complications, because of failure of prevention. The cost of treatment is high but the cost of doing nothing is far greater.³⁸ This is evident from this study, as the cost of hospitalisation is much higher.

Social security measures like medical insurance was the coping strategy adopted by 9% of men compared to 3% of women which is again a reflection on how women are being left out from the social protection mechanisms.

Conclusion: It is quiet evident from the present study, that women are spending less OOPE on diabetes care than

men. The gender difference in OOPE was persistent at all education level, economic position, marital status and financial dependency status. Self-report response bias and recall bias could be a limitation of the study. However measures were taken to reduce the bias by triangulating the information given by the participant with the records and bills that were available with the participant whenever available. It is also important simultaneously to look at strategies to reduce the gender difference in OOPE towards diabetes care.

Acknowledgement : The authors sincerely acknowledge Dr.Vijayaprasad Gopichandran, Assistant Professor, Department of Community Medicine, ESI Medical College & PGIMSR, K.K.Nagar,Chennai for providing inputs in the previous version of the manuscript.

REFERENCES

1. Amrita Namasivayam, Donatus C Osuorah RS, Diddy A. The role of gender inequities in women ' s access to reproductive health care: a population-level Study of Namibia, Kenya, Nepal and India. *Int J Women's Heal.* 2012;4:351-64.
2. Patel V, Kirkwood BR, Pednekar S, Pereira B, Barros P, Fernandes J, et al. Gender disadvantage and reproductive health risk factors for common mental disorders in women: a community survey in India. *Arch Gen Psychiatry.* 2006;63(4):404-13.
3. Ram U, Strohschein L, Gaur K. Gender Socialization : Differences between Male and Female Youth in India and Associations with Mental Health. *Int J Popul Res.* 2014;2014.
4. Singh PK, Rai RK, Alagarajan M, Singh L. Determinants of maternity care services utilization among married adolescents in rural India. *PLoS One.* 2012;7(2):e31666.
5. Ahuja R, Rajpurohit AC, Ahuja R. Gender inequalities in immunization of children in a rural population of Barabanki, Uttar Pradesh. *Indian J Community Heal.* 2014;26(4):372-6.
6. Tiwari AK. Gender Inequality in Terms of Health and Nutrition in India : Evidence from National Family Health Survey-3. *Pacific Bus Rev Int.* 2013;5(12):24-34.
7. Legato MJ, Gelzer A, Golland R, Ebner SA, Rajan S, Villagra V, et al. Gender-specific care of the patient with diabetes: review and recommendations. *Gend Med.* 2006 Jun;3(2):131-58.
8. Richmond J. How important are the psychosocial aspects of diabetes? *J Diabetes Nurs.* 1998;2(5):146-9.
9. Anderson RJ, Freedland KE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: A meta-analysis. *Diabetes Care.* 2001;24(6):1069-78.
10. de Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ. Association of depression and diabetes complications: a meta-analysis. *Psychosom Med.* 2001;63(4):619-30.
11. Ismail K, Winkley K, Rabe-Hesketh S. Systematic review and meta-analysis of randomised controlled trials of psychological interventions to improve glycaemic control in patients with type 2 diabetes. *Lancet.* 2004;363(9421):1589-97.
12. Chew B-H, Shariff-Ghazali S, Fernandez A. Psychological aspects of diabetes care: Effecting behavioral change in patients. *World J Diabetes.* 2014;5(6):796-808.
13. Ng YC, Jacobs P, Johnson JA. Productivity losses associated with diabetes in the U.S. *Diabetes Care.* 2001;24(2):257-61.
14. Jonsson B. The Economic Impact of Diabetes. *Diabetes Care.* 1998;21(3):7-10.

15. Clarke P, Gray A, Legood R, Briggs A, Holman R. The impact of diabetes-related complications on healthcare costs: Results from the United Kingdom Prospective Diabetes Study (UKPDS Study No. 65). *Diabet Med.* 2003 Jun;20(6):442–50.
16. Williams R, Gaal L Van, Lucioni C. Assessing the impact of complications on the costs of TypeII diabetes. *Diabetologia.* 2002;45:S13–7.
17. International Diabetes Federation. *IDF Diabetes Atlas.* 4th ed. Unwin N, Whiting D, Gan D, Jacqmain O, Ghyoot G, editors. *Idf Diabetes Atlas.* International Diabetes Federation; 2015. 1-527 p.
18. D.Ramsey S, Newton Ka, Blough D, K.Mcculloch D, Sandhu N, E.Reiber G, et al. Incidence, Outcomes, and Cost of Foot Ulcers in Patients with Diabetes. *Diabetes Care.* 1999;22:382–7.
19. Mani MP. Impact of Gender on Care of Type-2 Diabetes in Varkala , Kerala Master of Public Health. Achutha Menon Centre for Health Science Studies; 2008.
20. Ramachandran A, Ramachandran S, Snehalatha C, Augustine C, Murugesan N, Viswanathan V, et al. Increasing expenditure on health care incurred by diabetic subjects in a developing country: A study from India. *Diabetes Care.* 2007;30(2):252–6.
21. Kapur A, Björk S, Nair J, Kelkar S, Ramachandran A. Socio-economic determinants of the cost of diabetes in India. *Diabetes Voice.* 2004;49(3):18–21.
22. Vasudevan J, Mishra AK, Singh Z. An update on B . G . Prasad ' s socioeconomic scale : May 2016. *Int J Res Med Sci.* 2016;4(9):4183–6.
23. Ramachandran A, Ramachandran S, Snehalatha C, Augustine C, Murugesan N, Viswanathan V, et al. Increasing expenditure on health care incurred by diabetic subjects in a developing country: a study from India. *Diabetes Care.* 2007 Feb;30(2):252–6.
24. Kumar A, Nagpal J, Bhartia A. Direct cost of ambulatory care of type 2 diabetes in the middle and high income group populace of Delhi: The DEDICOM survey. *J Assoc Physicians India.* 2008;56(SEPTEMBER):667–74.
25. Brown AF, Ettner SL, Piette J, Weinberger M, Gregg E, Shapiro MF, et al. Socioeconomic position and health among persons with diabetes mellitus: A conceptual framework and review of the literature. *Epidemiol Rev.* 2004;26:63–77.
26. World Health Organization Global Health Expenditure. *Health expenditure,total (% of GDP).* World Bank. 2014.
27. Planning Commission. *Press Note on Poverty Estimates , 2011-12 Government of India Planning Commission July 2013.* *Press Inf Bur.* 2013;(July):1–10.
28. Saikia N, Moradhvaj, Kumar Bora J. Gender Difference in Health-Care Expenditure: Evidence from India Human Development Survey. *PLoS One.* 2016;11(7):e0158332.
29. Unknown. *Out of pocket expenditure of major morbidity and gender inequality in India.* 2003;
30. Maharana B, Ladusingh L. Gender Disparity in Health and Food Expenditure in India among Elderly. *Int J Popul Res.* 2014;2014:1–8.
31. Owens GM. Gender differences in health care expenditures, resource utilization, and quality of care. *J Manag Care Pharm.* 2008;14(3 Suppl):2–6.
32. Wei W, Akincigil A, Crystal S, Sambamoorthi U. Gender Differences in Out-of-Pocket Prescription Drug Expenditures Among the Elderly. *Res Aging.* 2006;28(4):427–53.
33. Holly A, Lamiraud K, Chevrou-Severac H, Yalcin T. Out -of - Pocket Payments for Health Care Expenditure. In: *Health and Health Care.* 2005. p. 126–32.
34. Onah MN, Govender V, Molyneux S. Out-of-Pocket Payments, Health Care Access and Utilisation in South-Eastern Nigeria: A Gender Perspective. *PLoS One.* 2014;9(4).
35. E.Kurlander J, Heisler M, KErr EA, D.Piette J, Krein S. Cost-Related Nonadherence to Medications Among Patients with Diabetes and Chronic Pain Factors Beyond Finances. *Diabetes Care.* 2009;32(12):2143–8.
36. Corrieri S, Heider D, Matschinger H, Lehnert T, Raum E, König H-H. Income-, education- and gender-related inequalities in out-of-pocket health-care payments for 65+ patients - a systematic review. *Int J Equity Health.* 2010 Jan;9(20):1–11.
37. Willis JR, Kumar V, Mohanty S, Singh P, Singh V, Baqui AH, et al. Gender differences in perception and care-seeking for illness of newborns in rural Uttar Pradesh, India. *J Heal Popul Nutr.* 2009;27(1):62–71.
38. Economic Intelligence Unit. *The Silent Epidemic - An economic study of diabetes in developed and developing countries.* 2007.

Conflict of Interest : None

Source of funding support: Self

How to cite this article: Joy Patricia Pushparani, Gracy Paulin, Sudharshini Subramaniam. Gender difference in quarterly out of pocket expenditure on Diabetes care in Thoothukudi – a cross-sectional study.. *Nat J Res Community Med* 2019;8(2): 137-143.

© Community Medicine Faculties Association-2019
 NJRCM: www.commedjournal.in

