

Effect of Variables on Quality of Life among Caregivers of Patients Undergoing Peritoneal Dialysis

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Abstract

Background: Most of the studies carried out abroad showed the effect of one or two variables on the constructs of burden, coping strategies, and quality of life (QOL) but nil in India context. These constructs change by cultural factors. The evaluation of variables influencing these constructs may be helpful in fine tuning the interventions to reduce the burden and to improve the QOL of caregivers of patients undergoing peritoneal dialysis (PD). **Aim:** The aim of this study was to investigate the impact of demographic, social and clinical variables on burden, coping strategies, and QOL in caregivers of patients undergoing PD. **Materials and Methods:** In this prospective study, we recruited 100 caregivers of patients undergoing PD and made assessment on burden, coping strategies, and QOL and evaluated the effect of demographic, social, and clinical variables on these constructs. **Results:** None of the studied variables showed effect on burden and coping strategies. Age, gender, duration of caregiving, presence of chronic disease, and duration of the presence of chronic disease showed a significant effect on QOL. **Conclusion:** The impact of demographic and clinical variables on QOL suggests these variables should be given adequate attention while developing interventions for alleviating the burden and improving the QOL of caregivers of patients undergoing PD.

Keywords: Caregivers, clinical variables, demographic, peritoneal dialysis, quality of life, social variables

INTRODUCTION

The age-related decline in renal function is termed as chronic kidney disease (CKD) and the major causative factors are hypertension, type 2 diabetes, and glomerular nephritis.^[1,2] Using threshold values of glomerular filtration rate the CKD is categorized into five groups. The global prevalence of CKD of stages 1–5 was reported as follows: 3.5%, 3.9%, 7.6%, 0.4%, and 0.1%.^[1] The fifth stage of CKD is known as end-stage renal disease (ESRD). ESRD is clinically managed by renal transplantation (RT), dialysis or conservative therapy with palliative care.^[3] Although RT is considered golden renal replacement treatment modality, it is limited by the shortage of organs and long waiting period which entails the ESRD patients to opt for dialysis such as hemo or peritoneal dialysis (PD) for the removal of uremic toxins. The choice of dialysis modality depends on the accessibility, comorbidity status, patient lifestyle, reimbursement policies, and experience of nephrologists.^[4] The age-adjusted prevalence of ESRD in India was reported to be 229 per million population.^[2] PD modality was introduced in India in 1991 it was found to be the third common modality after hemodialysis and RT.^[2-5]

Caregivers of patients undergoing dialysis carry the maintenance work load such as looking after hygiene of the patients, preparation of special diet, administration of drugs, fixing appointments, dialysis exchanges, fluid management, maintenance of stocks for the procedures and disposal of wastes impose mental, physical, financial and social demands on the caregivers and cause isolation, compromised daily activities which increase burden and reduce the quality of life (QOL) among them.^[6-9]

Most of the studies carried out on caregivers of patients undergoing PD investigated burden, and QOL.^[6,7,10-12] In a systematic review evaluating the burden and QOL of caregivers

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of dialysis patients observed the lack of studies evaluating the effect of demographic and social variables on burden and QOL.^[9] Only a few studies evaluated the association of burden and QOL with demographic and social variables in caregivers of patients undergoing PD.^[10,12] Investigations on the impact of demographic, social and clinical variables on burden score, coping strategies, and QOL may reveal information which may pave the way revising the interventions to reduce the burden, to encourage the positive coping strategies and to improve QOL under the light of the effect of these variables. Therefore, in this study, an attempt was made to study the impact of demographic, social and clinical variables on burden, coping mechanisms, and QOL in caregivers of patients undergoing PD.

MATERIALS AND METHODS

The inclusion and exclusion criteria followed for the recruitment of caregivers, instruments used for the assessment of burden, coping strategies and QOL, categorization of caregivers, internal and test-retest reliability of questionnaire, details of data collection, and calculation of final scores are given in our earlier study.^[13] The Human ethics committee of Institute gave clearance for this study (IEC No. 564). Our earlier study^[13] on 30 caregivers of patients undergoing PD showed a mean and standard deviation as 36.30 and 16.64, respectively. Assuming $\alpha = 0.05$ and $\beta = 0.2$, null hypothesis value of 31.50, the calculated sample size was 96. In this prospective study, we included a total of 100 participants fulfilling following the inclusion criteria and employing purposive sampling technique.

Statistical analysis

Mean and, standard error of the mean for presentation and Student's *t*-test and one-way analysis of variance (ANOVA) to compare means of continuous variables were used. The Chi-square was employed to compare the frequencies. To find the association between dependent and independent variables, linear regression, and Spearman's rank correlation for correlation between variables was performed. To check the influence of variables on burden score, coping and QOL subscales, the two-way multivariate ANOVA (MANOVA) was carried out. All computations were carried out using IBM SPSS Version 20, New York, USA.

RESULTS

Mean and standard error of burden, subscales of coping and QOL are presented in Table 1. The mean age of caregivers was 43.58 ± 1.48 years ranging from 18 to 62 years. Majority of caregivers were male, the Hindu, married, unemployed, spouses, had no illness, were care giving for an average of 1.33 ± 0.16 years and undergoing treatment for chronic disease for mean 1.55 ± 0.38 years. Eighty percent of caregivers were lettered and among them, the majority of them had secondary school education.

The mean score of burden among caregivers was 37.29 ± 1.53 . seeking social support was the dominant coping mechanism used by the caregivers. Lower mean scores in subscales of QOL

Table 1: Characteristics of caregivers of patients undergoing peritoneal dialysis (n=100)

Variable	Total (n=100)
Age (years), mean \pm SEM	43.58 \pm 1.48
Religion	
Hindu	92 (92.00)
Muslim	6 (6.00)
Christian	2 (2.00)
Marital status	
Unmarried	18 (18.00)
Married	82 (82.00)
Education	
Illiterate	15 (15.00)
Primary	15 (15.00)
Secondary	25 (25.00)
Intermediate	8 (8.00)
Graduate	24 (24.00)
Postgraduate	13 (13.00)
Occupation	
Unemployee	55 (55.00)
Private employee	20 (20.00)
Government employee	13 (13.00)
Labor	5 (5.00)
Pensioner	7 (7.00)
Relationship with patient	
Spouse	48 (48.00)
Children	28 (28.00)
In-laws	4 (4.00)
Parents	8 (8.00)
Relative	12 (12.00)
Presence of chronic diseases	
No illness	78 (78.00)
One disease	22 (22.00)
Duration of caregiving (years), mean \pm SEM	1.33 \pm 0.16
Duration of caregiving (years)	
0-5	97 (97)
6-10	3 (3.0)
Duration of chronic diseases (years), mean \pm SEM	1.55 \pm 0.38
Duration of chronic disease (years)	
0-5	89 (89)
6-10	11 (11)

SEM: Standard error of the mean; parenthesis indicates percentage

such as role limitations due to physical health (RLDPH) and role limitations due to emotional problem was observed in the caregivers of patients undergoing PD [Table 2].

DISCUSSION

Age

Age showed a significant association with physical functioning (PF), general health (GH), and physical component summary score (PCS) in MANOVA contributing 29%, 6%, and 4% variation in these variables [Table 3]. In bivariate correlation analyses, age significantly associated with PF ($r = -0.256$, $P = 0.00$), GH ($r = -0.339$, $P = 0.001$), and PCS ($r = -0.256$, $P = 0.01$). In univariate regression analyses,

Table 2: Burden score, coping mechanisms, and quality of life in caregivers of patients undergoing peritoneal dialysis (n=100)

Variable	Mean ± SEM
Burden score	
Coping mechanisms	37.29 ± 1.53
Confrontive coping	1.93 ± 0.06
Distancing	2.03 ± 0.06
Self-controlling	2.14 ± 0.04
Seeking social support	2.66 ± 0.03
Accepting responsibility	2.03 ± 0.07
Escape avoidance	1.24 ± 0.07
Planful problem solving	2.44 ± 0.05
Positive reappraisal	2.46 ± 0.05
Quality of life	
Physical functioning	74.50 ± 2.18
Role limitations due to physical health	48.75 ± 3.59
Role limitations due to emotional problem	48.66 ± 3.80
Social functioning	68.87 ± 2.39
Energy/fatigue	59.75 ± 1.84
Emotional well-being	63.60 ± 1.61
Pain	64.00 ± 2.63
General health	65.37 ± 1.48
Physical component	63.15 ± 1.86
Mental component	60.22 ± 2.02

SEM: Standard error of the mean

age significantly associated with PF (standardized beta [SB] = -0.586 , $P = 0.000$), GH (SB = -0.339 , $P = 0.001$), and PCS (SB = -0.339 , $P = 0.001$) and PCS (SB = -0.256 , $P = 0.01$) contributing 33.6%, 10.6%, and 5.6% variation in these variables. It is interesting to note that variation shown by the MANOVA and regression differs but reflect similar trend. Significantly, lower mean PF ($P = 0.00$), GH ($P = 0.00$), and PCS ($P = 0.01$) was observed in elderly (>40 years) than younger age groups (20–40 years). Lower PF, GH, and PCS suggests experiencing of limitations in physical activities and perceiving of poor and worsening health.^[14] Lower PF, GH, and PCS was observed with age in healthy controls.^[15] and lower PF was suggested to be associated with lower physical performance.^[16] The proportion of moderate to severe (58.33% vs. 41.66%) and severe burden (54% vs. 46%) ($P = 0.035$) was higher in older than younger caregivers. Burden score was significantly correlated with PF ($r = -0.214$, $P = 0.033$) GH ($r = -0.352$) and PCS ($r = -0.382$) ($P = 0.000$). Significant decrease in mean PF ($F = 3.28$, $P = 0.024$), GH ($F = 5.19$, $P = 0.002$) and PCS ($F = 7.27$, $P = 0.00$) was observed with an increase in the level of burden in one-way ANOVA. Mean PF ($P = 0.03$) and GH ($P = 0.000$) decreased in caregivers with the presence of chronic disease than without it. Lower PF and GH in aged than younger caregivers may be due to the higher prevalence of chronic disease (33.96% vs. 6.38%, $P = 0.002$). These observations suggest that besides aging, presence of chronic disease, and high burden may also be responsible for lower PF, GH, and PCS in aged than younger caregivers of PD patients.

Table 3: Influence of demographic, social and clinical variables on burden, coping and quality of life scores evaluated by two-way multivariate analysis of variance in caregivers of peritoneal dialysis patients

Variable	F	Significance	Partial Eta ²
Age			
Physical functioning	39.84	0.00	0.29
General health	6.90	0.01	0.06
Physical component summary score	4.69	0.03	0.04
Gender			
Physical functioning	4.48	0.03	0.04
Energy/fatigue	8.31	0.00	0.08
Emotional well-being	5.99	0.01	0.05
Education			
Distancing	2.37	0.04	0.13
Accepting responsibility	2.43	0.04	0.13
Occupation			
General health	2.72	0.035	0.12
Relationship			
Pain	2.73	0.034	0.10
Presence of chronic diseases			
Energy/fatigue	4.84	0.01	0.09
Pain	3.67	0.02	0.07
Social functioning	4.40	0.01	0.08
General health	6.79	0.01	0.13
Duration of chronic disease			
Seeking social support	4.92	0.02	0.04
General health	9.40	0.00	0.08
Duration of caregiving			
Physical functioning	7.13	0.00	0.06
Pain	4.03	0.04	0.04

Gender

In MANOVA [Table 3], significant effect of gender on PF, energy/fatigue (EF), and emotional well-being (EMW) was observed contributing 4%, 8%, and 5% variation in these variables. In bivariate correlation analyses, gender was significantly and positively associated with PF ($r = 0.233$, $P = 0.020$) EF ($r = 0.237$, $P = 0.018$) and EMW ($r = 0.201$, $P = 0.045$). In univariate regression analyses, gender significantly associated with PF (SB = 0.261, $P = 0.009$), EF (SB = 0.267, $P = 0.007$), and EMW (SB = 0.217, $P = 0.030$) contributing 5.9%, 6.2%, and 3.8% variation in these variables. Significantly higher mean PF ($P = 0.009$), EF ($P = 0.030$), and EMW ($P = 0.007$) was observed in female than male caregivers which in contrast with the observations in general population^[15-19] and caregivers of renal transplanted patients^[20] of earlier studies. Lower mean PF, EF, and EMW in males against females which is in contrast to the findings of caregivers of renal transplanted patients^[20] suggest that with change in treatment modality, trend in QOL subscales in genders is altered which needs to be explored. Higher mean PF, EF, and EMW in female against male caregivers suggests better QOL and no limitations in daily activities and are free from physical or emotional problems.^[14] Significantly lower mean PF in males

than females may be due to the significantly lower mean PF in married against unmarried male caregivers ($P = 0.020$). In the present study, higher proportion of married (89%) than unmarried (11%) caregivers in males was observed suggesting that presence of a higher proportion of married male caregivers may be responsible for lower PF score. In male caregivers, significantly lower mean EF score observed in those with no chronic disease than with chronic disease ($P = 0.017$) and those undergoing treatment for chronic disease for <5 years when compared to >5 years ($P = 0.012$). The significantly lower mean EF score in male caregivers may be due to the higher proportion of caregivers with no chronic disease (81%) and undergoing treatment for chronic disease for <5 years (87%). Significantly lower EMW score was observed in caregivers with no chronic disease than with it ($P = 0.046$). This observation suggests that lower EMW in male caregivers may be due to the presence of higher percent of caregivers with no chronic disease (80%).

Duration of caregiving

The duration of caregiving showed a significant effect on PF as shown by MANOVA and contributed 6% variation in this variable. In bivariate correlation analysis, the duration of caregiving was significantly associated with PF ($r = -0.254$, $P = 0.011$). In univariate regression analysis, significant association of duration of caregiving with PF was observed ($SB = -0.293$, $P = 0.003$). Significant lower mean PF was observed in caregivers involved in caring for 6–10 years than <5 years ($P = 0.003$) suggesting that increased duration of caring decrease QOL related to physical dimension due to limitations in physical activities.^[14]

Presence of chronic disease

Significant effect of the presence of chronic disease was observed on EF, pain, social functioning (SF), and GH in MANOVA contributing 9%, 7%, 8%, and 13% variation in these variables. In bivariate correlation analyses, significant association of the presence of chronic disease with EF ($r = 0.287$, $P = 0.004$), pain ($r = 0.241$, $P = 0.016$), SF ($r = 0.321$, $P = 0.001$), and GH ($r = -0.420$, $P = 0.000$) was observed. In univariate regression analyses, the presence of chronic disease was significantly associated with EF ($SB = 0.283$, $P = 0.004$), pain ($SB = 0.245$, $P = 0.014$), SF ($SB = 0.327$, $P = 0.001$), and GH ($SB = -0.436$, $P = 0.000$) contributing variation 7%, 5%, 9.8%, and 18.2% in these variables. Significantly higher mean EF ($P = 0.004$), pain ($P = 0.014$), and SF ($P = 0.001$), whereas in the case of GH ($P = 0.000$), significantly lower mean was observed in caregivers with one chronic disease than without it suggesting these caregivers have no limitations in daily activities due to pain, physical, or emotional problems but perceiving poor and worsening health due to the presence of chronic disease.^[14] GH was significantly associated with burden score in bivariate correlation analysis ($r = -0.338$, $P = 0.001$). One-way ANOVA showed decreasing mean GH with increase in the severity of burden ($F = 5.198$, $P = 0.002$). In the present study, 24% of caregivers had moderate to severe and 11% with severe burden. Lower mean GH may be due to the presence of moderate-to-severe burden (35%) among the caregivers.

Duration of presence of chronic disease

The significant effect of duration of the presence of chronic disease on GH was observed in MANOVA contributing 8% variation in this variable. In bivariate correlation analysis, significant association of the duration of the presence of chronic disease with GH ($r = -0.334$, $P = 0.001$) was observed. In univariate regression analysis, duration of the presence of chronic disease was significantly associated with GH ($SB = -0.356$, $P = 0.000$). Significantly lower mean GH was observed in caregivers with >5 years of duration of the presence of chronic disease against <5 years of duration of the presence of chronic disease. This observation suggest that increased duration of the presence of chronic disease in caregivers decrease QOL and this may also due to the lower and worsening perception of health by the caregivers.^[14]

This is a single-center study and the results cannot be generalized to all the caregivers of patients undergoing PD because the effect of cultural setting on burden, coping and QOL and religious groups, educational grades, and occupational categories are likely to change depending on the country where these instruments are tested. The results of the present study need to be tested in longitudinal and large sample studies to establish the findings. In the absence of studies on this aspect we could not compare our results with other studies. However, our result forms the frontline data on this aspect and attempt to formulate hypothesis in this research area.

CONCLUSION

To the best of our knowledge, this is the first study to evaluate the effect of demographic, social and clinical variables on burden score, coping strategies, and QOL in caregivers of patients undergoing PD modality. In caregivers of HD, effect of age on PCS was observed^[12,21] and sociodemographic factors on seven coping mechanism,^[22] whereas in caregivers of renal transplanted patients effect of gender on subscales of QOL such as RLDPH and role limitations due to emotional problem (RLDEP) was observed. Further, male than female caregivers of renal transplanted patients showed a higher mean RLDPH and RLDEP.^[20] In caregivers of PD patients in the present study, effect of age on PF, GH, and PCS; gender effect on PF, EF, and EMW; duration of caregiving on PF, presence of chronic disease on EF, pain, SF and GH and duration of the presence of chronic disease on GH was observed. Female showed higher mean PF, EF and EMW against male caregivers. It is interesting to note that none of demographic, social, and clinical variables showed any effect on burden score and coping mechanism. These observations suggest that effect of demographic, social, and clinical variables vary with treatment modality and the variable may also act differently in different modality. The results of this study suggest interventions to reduce burden and to improve QOL should be designed depending on the treatment modality.

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Conflicts of interest

There are no conflicts of interest.

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