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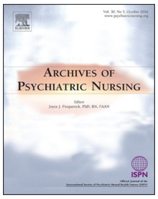

Quality of life in caregivers of a family member with serious mental illness: Evidence from China

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ABSTRACT

Purpose: To evaluate the quality of life (QoL) and social support among family caregivers of a family member with a mental illness and to identify factors associated with the QoL.

Methods: This is a cross-sectional study, where participants were recruited and independently interviewed using a questionnaire, consisting of demographic characteristics, the Medical Outcome Survey SF-36 form, and social support rating scales. Multiple stepwise regression analysis was used to analyse the factors related to QoL.

Results: 181 family caregivers were recruited in Shandong province, China. On a composite QoL score, family caregivers perceived that their QoL was poor (68.3), especially in the aspects of role-physical (61.3), role-emotional (57.6) and mental health (63.0). We also found family caregivers received low social support, especially in objective support and utilization of social support. Patient's illness state, care time, financial burden and objective support were significantly correlated to caregivers' QoL in the physical component score (PCS). Patient's illness state, patient's marital status, family monthly income, caregiver's knowledge about the illness, caregivers coordinating caring, life and work, subjective support received and utility of support were significantly associated with caregivers' QoL in the mental component score (MCS).

Conclusions: Social support had a significant correlation with caregivers' QoL. Caregivers should be encouraged to request assistance from other family members and friends in providing care, especially when caregivers are unemployed or long-time carers. Mental health education campaigns and helping families to maintain and enhance a supportive social network may provide useful means to improve caregivers' QoL.

Introduction

In 2001, the World Health Organization reported that 450 million individuals lived with mental health disorders worldwide (World Health Organization, 2001). A meta-analysis of mental health surveys across 59 countries between 1980 and 2013 estimated the pooled lifetime prevalence of common mental disorders among adults aged 16–65 was 29.2% (Steel et al., 2014). In China, lifetime prevalence rates for common mental disorders, which were likely biased downwards, were at least 13.2%. (Kessler et al., 2009). A report from the Chinese Center for Disease Control and Prevention (CDC) in, 2015 stated that more than 173 million individuals lived with mental disorders in China (Chinese Center for Disease Control and Prevention, 2015), and the CDC estimated that 16 million patients were diagnosed with a serious mental illness (SMI) in 2013 (Chinese Center for Disease Control and Prevention, 2011). Also in 2013, the World Health Assembly adopted the Comprehensive Mental Health Action Plan 2013–2020 to expand community-based mental health care services and to change the attitudes towards mental health in countries around the world. Moving away from wholly medical models, the Plan addressed education opportunities and income generation, housing and social services, and other social determinants of mental health (Thomas, 2013), which focused attention on the role of caregivers of family members with SMI.

For people with mental illnesses, family caregivers take the most prominent role in care giving (Huang et al., 2009). Family caregivers

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are relatives who provide daily-unpaid support for a person requiring assistance with daily living tasks (Manami, Makiko, & Fumiki, 2016; Savage & Bailey, 2004). Due to the cultural values of social obligation, reciprocity, loyalty and respect, it might be expected that rates of family caregiving in China are substantial. A 2011 review study reported that approximately 70% of people with schizophrenia lived with their family in Asian countries (Chan, 2011) and the overall resilience of Japanese family caregivers had an important influence on the recovery of patients with schizophrenia (Manami et al., 2016). In China, family also played the main role in taking care of SMI family members (Liu, Lambert, & Lambert, 2007). While China is moving to more community-based care for patients with mental illness, the shortage of community mental health facilities and psychiatric rehabilitation services means Chinese families still bear the major burden of caregiving (Awad & Voruganti, 2008;Lam, Ng, & Tori, 2013; Zeng, Zhou, & Lin, 2016). Thus, "informal care" in China plays a major role in the development and evaluation of mental health policies and programs (Clark & Drake, 1994).

Care within family settings means that the impact of caregiving on caregiver's mental and physical health and quality of life (QoL) should not be overlooked (Huang et al., 2009). QoL is a multidimensional concept including subjective and objective evaluations of a caregiver's mental, physical and social well-being state (World Health Organization, 2004). The World Health Organization has defined QoL as "The individual's perception of his or her position in life, within the cultural context and value system he/she lives, and in relation to his/her goals, expectations, parameters and social relations" (The WHOQOL Group, 1995). In a review of the caregiver literature, Caqueo-Urízar, Gutiérrez-Maldonado, and Miranda-Castillo (2009) concluded that informal caregivers experience negative changes to their QoL. A range of stresses related to the care-giving role can negatively influence the QoL of caregivers, including significant financial burdens, difficulties handling patient's disruptive behavior and uncontrollable patient emotions (Sales, 2003), a lack of time for personal entertainment and social engagement (Keung, Kit, Chan, & Fan, 2012), stigma and isolation (Chien, Chan, & Morrissey, 2007), and reduced time for full or part-time work. For example, research suggests that the incidence of caregivers developing depression is as much as 5-fold higher than that of the general population (Kessler, Chiu, Demler, & Walters, 2005; Lu et al., 2007). These negative impacts have been conceptualized as the "caregiver burden" (Vella & Pai, 2013) and are associated with caregivers' declining health status, depressive symptoms, inadequate social support and financial costs (Chien et al., 2007).

From the critical review of the pre-2009 literature on Chinese caregivers in families with mental illness, most articles focused on the QoL and social support of those caring for patients with schizophrenia in Hong Kong and Taiwan (Hsiao & Van, 2010). More recently, Chinese research has also studied family caregivers of patients with schizophrenia in the major urban centers of Guangzhou and Beijing (Caqueo-Urízar et al., 2009; Li, Fan, Chen, & Yang, 2008; Yan, Guo, & Wang, 2008; Zeng et al., 2016). While studies of Chinese caregivers of patients with schizophrenia have noted that caregivers' demographic characteristics, such as income and education, can be correlative factors to the psychological and physical caregiver burden (Li et al., 2008; Yan et al., 2008), the role of social support has not been investigated. In contrast, western research on caregivers to family members with SMI found that insufficient social support, followed by the caregiver burden, were the most significant correlative factors of caregiver depression (Saunders, 2003). Across diverse cultures, Chan found that social support was a significant protective factor affecting the caregiver burden (Chan, 2011). Further research on the social support and QoL of caregivers can inform clinical care and policy decision-making (Awad, Voruganti, & Heslegrave, 1997), especially in mainland China. Therefore, this paper has two aims: first, to investigate the QoL of caregivers of family members with SMI and, second, to evaluate the impact of social support on caregivers' QoL.

Methods

Design

Between October 2014 and January 2015, we recruited participants from a mental health center in Jinan, the provincial capital of Shandong Province. Trained researchers collected data in individual face-to-face interviews using a structured questionnaire. The sample consisted of 230 participants. None refused to participate due to the support from the director of the Jinan mental health center and caregivers' understanding of the research project. To be included in the study, family caregivers had to (i) provide primary care for one family member diagnosed with a SMI, according to the Chinese Classification and Diagnostic Criteria of Mental Disorders (such as schizophrenia, bipolar disorder, depression, paranoid mental disorders and epilepsy); (ii) have no history of a mental illness themselves; (iii) live in a household where only one family member had a SMI and (iv) age between 18 years and 65 years. Caregivers with a chronic physical illness, as well as those caring for more than one family member with mental disorders were excluded. One hundred and eighty- one (181) caregivers met the study criteria.

Ethical issues

The project was approved by the Medical Ethics Committee at Shandong University. Detailed information on the research project was communicated to caregivers, including procedures for protecting interviewees' and patients' privacy; arrangements for secure access to and storage of data; confidentiality arrangements for the one-on-one interviews in a private room; and the non-recording of patients' names.

Data collection

We utilized well-validated questionnaires to assess the participants' demographic characteristics, QoL, social support and the patients' general status. The following data were collected:

Demographic questionnaire

For the caregiver, a demographic questionnaire provided information on age, gender, hometown, marital status, education level, employment status, monthly income, relationship to patient, living with patients or not, health status, knowledge about the mental illness and SMI policy, and the total length of time and average number of hours per day spent caring for the patient. In terms of knowledge of mental illness and SMI policy, caregivers were asked to answer the questions "How much do you know about patient's mental illness?" and "How much do you know about government's policy on mental health?". Participants were given 5 options, "none", "little", "moderate", "much" and "completely". The demographic survey also asked the caregiver to provide information on the family member under their care, including age, gender, marital, education, and employment status, financial burden, illness state, medication and treatment compliance, and numbers of caregivers to care for each patient.

Caregiver needs and concerns

Caregivers were also asked to report the most concerning factors (such as patient's illness rehabilitation, illness severity and family financial burden) and most urgent needs related to caregiving, including their body health, material life, family situation, dream job and entertainment.

QoL measure

Self-reported levels of QoL was measured using the medical outcome survey (MOS) 36-Item Short Form (MOS SF-36) (Mchorney Jr, J, Lu, & Sherbourne, 1994), which is composed of eight sub-scales: physical functioning (PF), bodily pain (BP), role-physical (RP), general health (GH), role-emotional (RE), social functioning (SF), vitality (VT) and mental health (MH). Higher scores of each domain (range 0–100) indicate a higher perceived QoL. Aggregating the mean of PF, BP RP and GH provided physical component scores (PCS). Similarly VT, SF, RE and MH provided mental component scores (MCS) (Lin et al., 2009). The Chinese version of the SF-36 was translated and validated by Lam, Gandek, Ren, and Chan (1998), with 0.66–0.88 for the Cronbach's alpha coefficients, 91.4% for item convergent validity and 92.5% for item discriminant validity. MOS 36-SF has good reliability and validity in QoL studies of chronic disorders (Schlenk et al., 1998), psychiatric outpatients with schizophrenia in Hong Kong (Chien et al., 2007) and the Chinese mainland general population (Pan, Chao-Zeng, Hui-Jing, Wang, & Shan, 2011).

Social support measure

The Chinese version of the Social Support Rating Scale (SSRS) was used to measured social support (Xiao, 1994). The SSRS comprises 10 items covering three domains: subjective support (four items, ranging 0–32), objective support (three items, ranging 0 to 22), and utilization of social support (three items, ranging 0–12). Higher scores indicate better social support. The SSRS has demonstrated good reliability and construct validity in assessing psychological symptoms in community-dwelling elderly people (Leung, Chen, Lue, & Hsu, 2007). The Cronbach's alpha for the entire scale was 0.847.

Data analysis

Descriptive statistics were used to analyse the study population, using the mean scores of measured outcomes. Pearson's product-moment correlation and Spearman's rank correlation test were used to reveal the inter-relationships among the variables. We used stepwise multiple regression analysis to assess the variables significantly associated with QoL. To validate the model found in the stepwise selection procedure, the backward selection procedure was used. All data were double-input using Microsoft Access and checked for consistency. STATA 12.0 was used to perform the statistical analysis and statistical significance was assessed at level of 0.05.

Results

Sample characteristics

Respondents' were aged 18–65 years, with a mean age of 45.9 (SD = 9.2). Approximately 65% (65.8%) of caregivers were female (n = 119), with the patient's mother accounting for 40.3% (n = 73), spouse 23.2%, (n = 42), father 14.9% (n = 27) and children 8.8% (n = 16) of caregivers. The remaining family caregivers were mainly grandparents and siblings. The mean family monthly income was US $400.0 (SD = 300.8), and 53.6% rated the caregiving financial burden as "heavy". About 30% of respondents had requested leave from their jobs, and 9.4% of caregivers had resigned from their job, to care for their family member with SMI. Fifty-six percent (56.4%) of caregivers took care of patients for > 16 h per day. More than 90% had a basic knowledge of the mental illness with which the patient was diagnosed, but 66% knew nothing about China's mental health policy. More detailed characteristics of family caregivers are showed in Table 1.

Patient characteristics are presented in Table 2. Approximately 63% of patients were female and their mean age was 32.3 years (SD = 17.5). The average duration of illness was 2.8 years (SD = 0.9), with a range of one month to ten years. Most patients with SMI had a secondary education level (60.2%) and 54.1% were married. Among the 181 patients, 63 (34.8%) were diagnosed with schizophrenia, 64 (35.4%) with affective disorders, 28 (15.5%) with paranoid mental disorder and 26 (14.3%) with other psychotic disorders.

Table 1
Demography characteristics of family caregivers (n = 181).

Variable	n	%	Variable	n	%
Gender			Relationship with patient		
Male	62	34.3	Father	27	14.9
Female	119	65.7	Mother	73	40.3
Age			Spouse	42	23.2
Age 18–24	2	1.1	Child	16	8.9
Age 24–45	92	50.8	Others	23	12.7
Age 45–65	87	48.1	Live with patient		
Education level			Yes	154	85.1
Primary	28	15.5	No	27	14.9
Secondary	112	61.8	Care time		
High post-secondary	41	22.7	≤1 year	125	69.1
Marital status			2 years	27	14.9
Unmarried	2	1.1	> 2 years	29	16.0
Married	172	95.0	Hours of caring patient everyday		
Divorced or widowed	7	3.9	≤8 h	54	29.8
Employment status			9–16 h	25	13.8
Farmer	34	18.8	16–24 h	102	56.4
Employed	62	34.3	Knowledge about the illness		
Unemployed	44	24.2	None or little	9	5.0
Others (housewife, retired)	41	22.7	Basic	41	22.6
Monthly household income (US$)			More or completely	131	72.4
< $147	24	13.3	Policy of mental health		
$148–293	37	20.4	None or little	121	66.9
$294–440	51	28.2	Basically	46	25.4
$441–570	35	19.3	Much or completely	14	7.7
> $571	34	18.8	Coordinating caring, life and work		
Financial burden			In anytime(no job)	78	43.1
Heavy	97	53.6	In spare time	32	17.7
Acceptable	84	46.4	Ask for leave	54	29.8
			Resignation	17	9.4

US$, United States dollars.
Based on a currency exchange rate of the 6.1428 yuan to US$1.00 in 2014.

Table 2
Demographic characteristics of patients (n = 181).

Variable	n	%	Variable	n	%
Gender			Marital status		
Male	79	43.6	Single	114	63.0
Female	102	56.4	Married	67	37.0
Age			Classification of diseases		
Age < 18	39	21.6	Schizophrenia	63	34.8
Age 18–24	39	21.6	Affective disorders	64	35.4
Age 24–45	62	34.3	Paranoid mental disorder	28	15.5
Age 45 +	41	22.5	Other psychotic disorders	26	14.3
Education level			Illness state		
Primary	32	17.7	Bad	50	27.6
Secondary	109	60.2	Neutral	64	35.4
High post-secondary	40	22.1	Very good	67	37.0
Number of family members caring of patient			Duration of illness		
1	77	42.5	< 1 year	85	45.0
2	83	45.9	1–5 years	48	26.5
≥3	21	11.6	5–10 years	27	14.9
			> 10 years	21	11.6

Caregiver needs and concerns

The most concerning factor for caregivers was whether their family member could recover (63.0%), with 16.6% worried about the disease severity and 12.7% worried about the economic burden. Eighty-four percent (84.5%) of participants reported that their most urgent need was their health, while only 6.1% choose material life, 3.9% marriage

Table 3
Social support of family caregivers based on SSRS (n = 181).

Variables and score range	Mean (SD)
Subjective support (0 − 32)	25.3 (4.7)
Objective support (0 − 22)	8.7 (2.9)
Utilization of social support (0 − 12)	7.4 (2.1)
Total score (0–66)	41.4 (7.3)

Table 4
Results of stepwise multiple regression analysis for QoL in domain of PCS (n = 181).

Variable	B	t	p
Care time	− 15.26	− 2.10	0.046
Financial burden	− 18.72	− 2.68	0.008
Patient's illness state	24.73	3.26	0.001
Objective support	6.92	3.21	0.002

Table 5
Results of stepwise multiple regression analysis for QoL in domain of MCS (n = 181).

Variable	B	t	p
Patient's marital status	27.09	2.24	0.026
Family monthly income	13.46	2.94	0.004
Patient's illness state	24.56	3.37	0.001
Coordinating caring, life and work	− 13.13	− 2.34	0.020
Knowledge about the illness	20.94	2.08	0.039
Subjective support	3.21	2.45	0.015
Utility of support	8.64	3.02	0.003

and family, 3.2% dream job and 2.3% entertainment.

Social support

Table 3 indicates the social support caregivers received. The mean score of subjective support was high (25.3 out of 32), while the mean score of objective support was low (8.7 out of 22). The score of utilization of social support in our sample ranged from 3 to 12, with the mean score of 7.4. The stepwise multiple regressions results are presented in Table 4. Patient's marital status had a significant association with both subjective support and objective support of the caregivers. Financial burden was also significantly associated with objective support and utility of support.

Quality of life

Fig. 1 shows that caregivers had an average QoL total score of 68.3 out of 100. Caregivers had a higher perceived QoL in the PCS (72.4) than the MCS (65.0). For the PCS, the mean score of PF was highest (86.6), while the mean score of RP was lowest (61.3). For the MCS, the score of RE was lowest (57.6) compared to an average of 67.5 for the other three MCS measures.

Factors related to family caregivers' QoL

The stepwise multiple regressions results are presented in Table 4 and Table 5. The patient's illness state, caregivers' care time, financial burden as well as objective support received were significantly correlated to caregivers' physical health QoL domain. Patient's marital status and illness state, family monthly income, caregivers' coordination of caring, life and work, knowledge about SMI, subjective support received as well as utility of support were significantly correlated to caregivers' QoL in the domain of mental health.

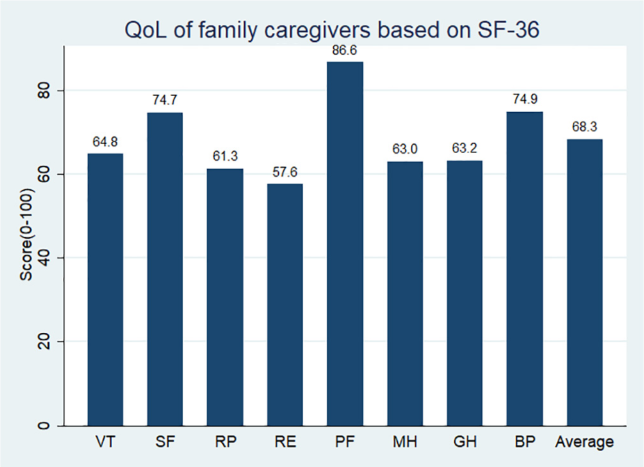

Fig. 1. QoL of family caregivers based on SF-36.

Discussion

Given China's unique cultural context and the reliance on family caregiving, caregivers' QoL is an important practical and public policy concern. Our findings showed that caregivers' QoL is a multidimensional phenomenon, where caregivers' physical health, mental health, financial situation and social life interact (Rungreangkulkij & Gilliss, 2000). This investigation of caregivers' QoL and the correlation between social support and caregivers' QoL highlights the multidimensional nature of caregiver health. Findings also indicate that caregivers had low QoL in several domains including role-physical, role-emotional and mental health. Further, caregivers rated themselves as having minimal levels of past support and little support seeking behavior. Our findings also suggest that the caregivers receiving good support from their colleagues, friends, neighbors and relatives had a better QoL. We found that different aspects of social support were correlated to the QoL differently in the mental and physical domains.

Compared with the QoL of the general population in Shandong province (Jing, Liu, Ding, Xiangyun, & Han, 2008) and China (Pan et al., 2011), family caregivers in our study perceived themselves with a poorer QoL, with both the mental summary and psychical summary scores lower than those for the general population. Using the same scales, caregivers in our study reported a lower QoL in the domains of role-physical (61.3 < 77.5), bodily pain (74.9 < 82.2) and role-emotional (57.6 < 67.9) than the general population in China (Pan et al., 2011). Since caregivers spend much of their time caring for a SMI family member, they lack time for personal entertainment and social engagement. Also, the QoL of carers in our sample was lower than that reported in Western studies, but higher than in Hong Kong (Chien et al., 2007). Levels of social support in the current sample were similar to those reported by Zeng et al. (2016) in their study of Guangzhou-based caregivers.

Our study reinforces the Hong Kong (Chien et al., 2007) and Guangzhou (Zeng et al., 2016) studies that found Chinese families were cohesive units, depending on each other for support in daily life. Previous studies (Caqueo-Urízar et al., 2009; Liu et al., 2007) have suggested that social support was the most important influencing factor of the family caregiver burden, not only for those caring for family member with a chronic physical disease or terminal illness (Chou, 2000), but also individuals with schizophrenia (Chan, 2011; Chien et al., 2007; Zeng et al., 2016) and other severe mental illnesses (Cole & Reiss, 2017; Schlenk et al., 1998).

Sharing stress with others can reduce caregivers' stress. When relatives provided a supportive social network, Magliano et al. (2003) reported the caregivers looking after patients with schizophrenia had lower pessimism and caregiver burden. Our findings also showed that caregivers with more subjective support and higher utility of support had a better QoL. We found that different aspects of social support correlated with QoL differently in the physical and mental domains. First, objective support had a significant correlation with caregivers' physical health QoL domain, and, second, subjective support and the utility of social support were significantly and positively correlated with the domain of mental health. We confirm the policy recommendation that caregivers should be encouraged to request assistance from other family members and friends to share the care of SMI family members, especially when caregivers are unemployed or have been long-time carers (Liu et al., 2007). Further, increased caregiving assistance will free-up caregivers own time to manage their personal mental and physical health needs, which should improve their QoL (Li, Lambert, & Lambert, 2007).

In addition, the significant relationships between caregiver QoL and key social-demographic characteristics of their patients indicated these related factors could increase the risk of a poor QoL, including negative emotions, social isolation, self-harm and suicide (Chien et al., 2007; Chou, 2000). Our results suggest that the longer the time spent caring for patients with SMI, the poorer the caregivers' quality of life. This finding is supported by previous studies where caregivers of patients with schizophrenia and other SMI, who spent longer hours caring for the SMI patients, experienced a perception of lower levels of QoL (Yan et al., 2008; Zeng et al., 2016). This was especially pronounced for employed caregivers who dealt with both work related issues and caring for a SMI family member. Previous studies also demonstrated that many caregivers when caring for a family member with a mental illness have to quit their jobs or retire early (Tsang, Tam, Chan, Cheung, & Chang, 2003; Zeng et al., 2016). Our results supported this finding as life and work were significantly correlated to the QoL in the domain of mental health. Among the 181 caregivers, about 10% of caregivers had to quit their job and about 30% had to ask for work leave. Clearly, unemployment or asking for leave from work can result in financial difficulties and poorer mental and physical health for family caregivers.

Indeed, household income was manifested to have a significant correlation with caregivers' QoL, which is consistent with previous research that indicated household income and physical health were the most important factor of the family caregivers' QoL (Li et al., 2007). The caregivers with higher (lower) household income experienced less (more) economic burden when caring for a SMI family member. Caregivers of lower social-economic status and income might experience higher rates of family conflicts and disharmony than more affluent and higher socio-economic status families. In developing countries, the QoL was affected by caregivers' economic burden (Caqueo-Urízar et al., 2009; Li et al., 2008). Therefore, financial support for caregivers that lessens their financial difficulties would attenuate the perceive caregivers' burden and facilitate a better QoL. This argument is also supported by previous research conducted in mainland China, where family income was shown to be related to caregiver economic burden (Tsang et al., 2003) and in Hong Kong where income levels of caregivers predicted their well-being when caring for family members with SMI (Zeng et al., 2016). Budget constraints on government social support and health programs in China impose limits on financial support for caregivers.

Our study also indicated that knowledge about the mental illness was significantly associated with QoL in the domain of mental health. The shortage of knowledge about mental illness led to more concerns about the discrimination against mental disorders, increasing caregivers' sense of burden (Li et al., 2007). Studies in Japan and South Africa (Abraham, Vansteenwegen, & Ide, 2006; Bishop & Greeff, 2015; Manami et al., 2016) also found understanding the features of the disease could help caregivers to recognize mental health problems of family members, and evaluate and accept the situation. Providing culture-specific health education programs about mental disorders and its treatment is an important mental health public policy intervention for carers' families and the general public.

Patients' illness state was significantly associated with the caregivers' QoL, not only in the domain of physical health ($p < 0.001$), but also in the domain of mental health ($p < 0.001$) Similarly, Tan et al. (Tan & Liu, 2001) found that the illness state of patients with schizophrenia was the main influence factor to their carer's QoL. For caregivers of individuals with depression, worry about the recurrence of depression was a significant predictor of the QoL (Li & Long, 2005).

A number of limitations in this study should be taken into account. Common with other studies (Zeng et al., 2016), the convenience sampling method may limit the generalizability of research outcomes. Further studies should be conducted in other regions and multiple sites. In addition, current cross-sectional studies themselves have the disadvantage of only analysing the research outcomes at a certain point in time. Using times series data, there is a need to develop the causal relationships between social support, QoL and social-demographic variables. Finally, the survey did not include a control group, which should be included in future studies.

Given these limitations, our study has crucial practical implications. Lower social support was significantly correlated to lower QoL of caregivers of SMI family members (Zeng et al., 2016). Therefore, encouraging caregivers to request support from other family members, friends, and colleagues, would improve caregivers' QoL. Subject to China's health care budget, government caregiver support would also improve caregivers QoL. Education campaigns to improve caregivers' knowledge about SMI, especially when caregivers are unemployed and have a long-time carer role, would benefit caregivers' welfare. Furthermore, caregivers experiencing low levels of household income, have lower perceived QoL. To improve caregivers QoL, policy-makers should fund more community-based care facilities and encourage the establishment of family-based support teams as well as provide social support services. Policy might be directed to backing supportive family bonds and social networks based on the core Chinese values (Chien et al., 2007; Spector, 1991) To improve caregiver psychological health and QoL, more education services at the family and individual level are recommended, and governments should provide financial support to family caregivers as part of a policy to fully recognize the key role of family caregivers in resourcing people with SMI (Liu et al., 2007; Zeng et al., 2016).

Conclusion

The QoL of the family caregivers who taking care of patients with SMI is poor. The findings promoted our understanding of the interaction of social-demographic variables correlated with the QoL of caregivers whose family members with SMI. Social support is significantly correlated with promoting caregivers' QoL.

Relevance to clinical practice

These findings appeals physicians and nurses to treat patients professionally, without ignoring the concerns of the QoL of the caregivers. It is essential to develop and implement effective and operable intervention strategies to promote family caregivers' QoL. Clinical education campaigns related to mental health need to focus on the knowledge of the mental disorders that patients lived with especially targeting long-time caregivers. In addition, caregivers, especially those who are unemployed or long-time carers, should be encouraged to request assistance from other family members and friends to share the care of SMI family members. Where government financial support is likely to be limited, it is useful to improve caregivers' QoL by assisting families to maintain and reinforce a supportive social network.

Declarations

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Conflict of interest statement

None of the authors has any conflicts of interest.

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Ethics approval and consent to participate

Participants were informed that they could refuse to answer any question. The questionnaire did not ask about infection status, and no biological samples were collected. The project was approved by the Medical Ethics Committee at the Shandong University School of Medicine (Grant No. 201001052).

Consent to publish

Not applicable.

Authors' contributions

Jian Wang contributed towards the article by making substantial contributions to conception and design. Caifen Xu contributed towards the article by collecting data. Anli Leng undertook the statistical analysis, interpretation of the data, and writing the manuscript. Stephen Nicholas and Jennifer Nicholas engaged in interpreting the results and writing the paper.

Availability of data and materials

The dataset analysed in the current study is available from the corresponding author on reasonable request.

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