Psychiatry Research 271 (2019) 39–45

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

The correlation between the quality of life and clinical variables among outpatients with schizophrenia

Abd Al-Hadi Hasan

Fakeeh College for Medical Sciences, Fakeeh College for Medical Science, 1222, Jeddah, Saudi Arabia

ARTICLE INFO

Keywords:
Quality of life
Schizophrenia
Outpatient clinics

ABSTRACT

The study identifies the correlation between the quality of life (QoL) among outpatients with schizophrenia and clinical outcomes. A cross-sectional study design was used with 157 people with schizophrenia treated in outpatient clinics. Demographic, clinical and psychosocial variables were examined for their influence on QoL. Data were analysed with descriptive statistics, Pearson product moment correlation and stepwise forward multiple linear regression. The majority of the study participants were female, single, unemployed, had secondary level of education or less and were being supported financially by family members. QoL correlated negatively with advanced age, male gender, longer duration of illness, high body mass index and prescribed typical anti-psychotic medication. However, it was related positively with employment and being married. Illness duration, recurrent hospitalisation, knowledge level about schizophrenia, psychiatric symptoms and coping mechanisms were found to be key significant predictors of QoL among participants. The study findings enhance our understanding of socio-demographic, clinical and psychosocial characteristics influencing the QoL in people with schizophrenia. Involvement of families in the management process may improve patients' ability to be integrated in the community and be more socially active.

1. Introduction

Schizophrenia is a heterogeneous illness which includes psychotic features, cognitive deficits and daily performance interruption (Sin and Norman, 2013). It is one of the most serious forms of mental illness and can be chronic, recurrent, disabling and debilitating among people being treated in psychiatric clinics in both developing and developed countries (Devaramane et al., 2011). Schizophrenia is linked with significant changes in thought processes and behaviour (e.g. bizarre, purposeless). It is characterised by interruption in the form and content of thinking processes, emotional status, perception (e.g. hallucinations, delusions and loss of associations), language and sense of self. Usually, recurrent relapse in schizophrenia is associated with exacerbation of psychotic symptoms and deterioration in function (Sin and Norman, 2013)

The management of schizophrenia has shifted from hospitals towards community care. Unfortunately, the public perceive mentally ill people as irresponsible, aggressive and dangerous (Chan et al., 2009; Lehman and Steinwachs, 1998). Moreover, mentally ill people are marginalised and discriminated against because of social stigma and stereotyping in the community, which may have an adverse impact on their QoL (Abdullah and Brown, 2011; Weatherhead and Daiches, 2010). The healthcare system in Jordan consists of three main sectors: the Ministry of Health, the military and private systems. Each has its own funding, strategy and health insurance schemes. The Ministry of Health provides healthcare to the majority of the Jordanian population (Ministry of Health, 2008; WHO, 2011). Mental healthcare is delivered to Jordanians diagnosed with mental illness throughout four mental health hospitals and 64 outpatient clinics.

Arab culture puts more emphasis on the interdependent values and beliefs (Al-Krenawi and Graham, 2000). This makes Arab people attitudes towards people with mental illness greatly vary from those in western countries. Some people view schizophrenia as character weakness and laziness or punishment for not respecting ancestors (Al-Krenawi et al., 2009; Hassan Fadlalla, 2005; Lam et al., 2006), whereas other attributes mental illness to sudden fright, possession of evil spirits, use of magic, head accidents, bad genes, emotional trauma, punishment from God or due to evil eye (Endrawes et al., 2007; Gearing et al., 2015). Such beliefs about the causes of mental illness may induce the stigma from a different perspectives: that mental illness is a punishment for one's sins is the result of a person's weak faith (Aloud and Rathur, 2009) or punishments for one's sins (Weatherhead and Daiches, 2010) which is likely contribute to the stigma attached to mental illness in Arab cultures (Abdullah and Brown, 2011). Stigma perceiving is associated with interfering to seek treatment from mental health service, engage in rehabilitation interventions, medication

E-mail address: aalhasan@fcms.edu.sa.

https://doi.org/10.1016/j.psychres.2018.09.062
Received 13 August 2017; Received in revised form 8 May 2018; Accepted 28 September 2018
Available online 02 October 2018
0165-1781/

adherence (Fung et al., 2011; Sibitz et al., 2011).

In addition, in Arab culture, the distinction between physical and psychological health is not widely common as has historically been prevalent in Western Cultures. Arab-Muslim literature reveals that Arab-Muslim do not distinguish emotional or psychological distress from physical illness and the majority of populations tend to somatise their illness in which mental ill patient expresses an emotional disorder in the presentation of physical symptoms (Al-Krenawi et al., 2000c; Endrawes et al., 2007; Fogel and Ford, 2005). Furthermore, limited professional support impacts negatively on QoL. Taking into consideration, there is a need to identify significant predictor for people diagnosed with schizophrenia QoL in order to address these factors properly (Daradkeh and Al Habeeb, 2005; Rayan and Obiedate, 2017a; Rayan, 2017b).

In developing countries, mental health patients and their families may be neglected or viewed disparagingly by society (Aloud and Rathur, 2009). As a result, QoL is an important outcome in mental health research (Awad and Voruganti, 2012). In recent years, QoL studies have provided an overview of the impact of mental healthcare services on health status among people with mental illness, and schizophrenia in particular (Awad and Voruganti, 2012). QoL provides essential information which can be used for planning and evaluating clinical interventions (Fujimaki et al., 2012; Hsiao et al., 2012). Furthermore, QoL measures indicate the level of health status improvement rather than a complete cure (Hsiao et al., 2012).

Although there is no consensus on a definition of QoL, it is “an individual's perceptions of their position in life in the context of the culture and value systems where they live and in relation to their goals, expectations, standards and concerns” (Group, 1998). The findings of previous studies in Western countries show that people with schizophrenia reported significantly poorer QoL than the general population (Evans et al., 2007; Picardi et al., 2006). In this sense, determinants of QoL among people diagnosed with mental illness have been extensively studied, including socio-demographic characteristics (i.e. gender, education level, household income, marital status) (Hsiao et al., 2012; Kao et al., 2011), clinical variables (e.g. duration of illness, severity of psychiatric symptoms, number of rehospitalisations) (Adewuya and Makanjuola, 2009; Ritsner et al., 2012) and psychosocial characteristics (social support, self-esteem, stigma) (Galuppi et al., 2010; Ho et al., 2010). However, inconsistency in study findings might be explained by the using of non-specific instruments to assess QoL among people with schizophrenia, and limited number of studies have used a specific QoL tool designed for people with schizophrenia.

A meta-analysis included 17 studies found that general psychopathology contributed to the quality of life among people with schizophrenia more than positive and negative symptoms (Bechi et al., 2017; Tolman and Kurtz, 2010). While neurocognitive is largely unrelated to subjective quality of life, social cognitive contributes to subjective quality of life (Tas et al., 2013), with patients with a relatively unimpaired theory of mind reported lower subjective quality of life (Bechi et al., 2017).

Schizophrenia impacts several aspects of life, causing physical, psychological and social problems related to the illness itself or to the side effects of medication (Xia et al., 2011). QoL entails several essential dimensions, such as personal wellbeing, functional abilities, social interaction, psychological and economic status as well as physical health (Zendjidjian et al., 2012). There is a paucity of psychiatric QoL studies which used specific QoL tools designed for people with schizophrenia, either at the international level or in Jordan. In addition, schizophrenia and schizoaffective disorders are the most prevalent forms of mental illness. Broadly speaking, people diagnosed with mental illness are widely stigmatised, isolated and poorly integrated in society (Corrigan et al., 2012; Hasan and Musleh, 2017). With these concerns in mind, the QoL scales used (WHO-QOL, Chinese version of QoL, and modular system for QoL) are not specific to people with schizophrenia, being more concerned with general health. Therefore, the current study was designed to utilise a scale devised specifically to assess the QoL of people with schizophrenia. Richieri et al. (2011) devised a specific tool to assess the QoL of people with schizophrenia and reported a low correlation between the former and generic QoL scales (i.e. GHQ, SF-36), which suggests that the two instruments do not measure the same elements. In addition, the generic QoL scales were developed from the point of view of experts or physicians, which may be entirely different from the views of people with schizophrenia. Likewise, Richieri et al. (2011) reported that the QoL dimension for people with schizophrenia is different from that of other chronic illnesses, due to the very nature of the illness. Information on QoL and its correlates will assist in developing evidence-based intervention that can improve satisfaction with multiple aspects of life among people with schizophrenia. Moreover, the scope of the previous studies focused on outpatients with schizophrenia.

Jordan is a developing country with a lower-middle income level and a population of 11 million in 2015 (Department of Statistics, 2016). The country has a traditional extended family system, and family social support is the norm. Clarifying the relationship between QOL, social support and severity of psychiatric symptoms in Jordanian patients with schizophrenia represents an important step both in elucidating factors affecting QOL for individuals with schizophrenia and in understanding the utility of the concept of QOL for guiding future treatment (Eack and Newhill, 2007). Identifying predictors of QOL will also help in developing new programmes that aim to improve the QOL of people with schizophrenia. Previous studies showed that people with schizophrenia had poor knowledge about their illness (Al-HadiHasan et al., 2017; Hasan et al., 2015). Moreover, the healthcare system in Jordan focuses on a biomedical model of treatment for such patients.

Therefore, this study aimed at examining levels and correlations of QOL, social support, insight into illness, coping mechanism, level of antipsychotic medication side effects and severity of psychiatric symptoms (independent variable) as well as identifying the predictors of QoL (dependent variable) in Jordanians with schizophrenia. More specifically, this study aimed to answer the following research questions: (1) what are the levels of QoL domains (physical health, psychological health, social relationship, and environmental health) among Jordanians with schizophrenia? (2) What are the levels of social support perceived by the sufferers from their friends, family members, and significant others? (3) What are the levels (severity) of psychiatric symptoms (positive, negative and affective) experienced by the sufferers? (4) What are the levels of side effects experienced and the knowledge level among the sufferers’ friends, family members, and significant others? (5) What are the relationships between QoL domains and the studied variables of Jordanian patients with schizophrenia? (6) What are the variables that best predict QoL domains of Jordanian people with schizophrenia?

2. Methods

2.1. Study design and sampling

A cross-sectional, correlational research design was used to recruit participants. Each person with schizophrenia presented in the clinic, on a random basis, was invited to take part in the study. This process ceased when the target number was achieved (consecutive sampling).

2.2. Inclusion criteria were

- Living in the community with clinical stability for at least three months before recruitment. Clinically stable was defined as an increase in the dose of an antipsychotic drug of not more than 50% over the previous three months’ dosage (Lobana et al., 2001).
- All participants should be able to read and write English or Arabic and be willing and able to consent.

2.3. Exclusion criteria were

- Patients were excluded if they had a learning disability, or known organic mental disorder.
- Had current substance abuse, current inpatient treatment or the presence of visual, language or communication difficulties ($n = 9$).

2.4. Setting

The study was conducted at three mental health outpatients' clinics operated by the Ministry of Health. These clinics were chosen because they serve the majority of psychiatric patients, and were easily accessed by the researcher.

2.5. Recruitment

Jordanians with schizophrenia or schizoaffective disorder typically visit outpatient clinics monthly. A poster was displayed in these clinics advertising the study and requesting volunteers. Interested participants received further information directly from a researcher. The study recruited patients being treated in these clinics when they attended for appointments, regardless of the duration of their illness. A study information package was given to each participant alongside a verbal explanation about the project. Sufficient time was afforded to each participant to read the information. Participants were asked to return a signed consent form to the nursing department in the clinic. The researcher administered a study inclusion checklist to assess participants' eligibility. Then, research assistants interviewed each participant to assess their understanding of what they were consenting to, then she used instruments to assess interested outcome of measures. However, primary investigator administered PANSS scale because he is certified to use it. Ethical approval was obtained from the Scientific Research Committee of the Ministry of Health (ref: 2017/11/46871).

2.6. Assessments

2.6.1. Socio-demographic data

All participants completed a demographic information sheet, which included data on gender, age, education level, employment status, marital status, illness duration, household income, number of previous hospitalisations, and type of antipsychotic medication. Researchers received permission to use study outcome measures.

2.6.2. Body mass index (BMI)

The participants' body weight and height were measured, using standardised equipment and procedures.

2.6.3. Knowledge level of schizophrenia

The knowledge about schizophrenia questionnaire (KASQ) is a self-rated questionnaire. It has 25 multiple-choice items intended to measure various aspects of schizophrenia, including basic knowledge about schizophrenia and its management, aetiology, prevalence, prognosis, treatment and anti-psychotic medication effects and side effects. The KASQ is scored from 0 to 25 with a higher score indicating greater knowledge. Cronbach's alpha was 0.88. The reason for choosing knowledge was to test whether high versus limited knowledge impacts QoL, and its correlation with the severity of psychiatric symptoms.

2.6.4. Severity of psychiatric symptoms

The positive and negative syndrome scale (PANSS) questionnaire was developed by Kay and Lindenmayer (1988) to assess positive, negative and general psychopathology schizophrenia symptoms. The scale measures 30 clinical symptoms of schizophrenia, scoring from 1 (absence of psychopathology) to 7 (severe psychopathology); higher total scores thus indicate poorer mental health status. The scale has good internal reliability, and criterion-related validity. The result indicated high correlation between two positive scales ($r = 0.77$, $P < 0.0001$) and negative scales ($r = 0.77$, $P < 0.0001$). Sub-items of PANSS have been used to assess anxiety and depression. The decision to use these items was the study employed several outcome measures which might burden participants and some studies followed the same pattern (Meesters et al., 2013).

2.6.5. Drug-induced extrapyramidal symptoms

The drug-induced extrapyramidal symptoms scale (DIEPSS) was employed to evaluate and exclude the effect of symptoms that might affect the scoring of psychiatric severity symptoms. This scale has nine items scored from 0 to 4 (Inada, 1996). Cronbach's alpha was 0.86.

2.6.6. Coping strategies

A self-administered stress coping questionnaire measured coping behaviour in reaction to stressors. This scale has 114 items rated from 1 to 5 (Jankle et al., 1985). It classifies coping mechanisms into three positive mechanisms and one negative. Positive coping 1 (devaluation) includes belittling, playing down or guilt defense in stressful situations. Positive coping 2 (distraction) includes diversion, relaxation and compensation. Positive coping 3 (stress control) involves control over situations with positive self-instruction. Negative coping covers social withdrawal, resignation and self-pity. The internal consistency ranged from 0.84 to 0.94.

2.6.7. Quality of life

Schizophrenia quality of life (S-QoL) has 18 items measuring eight dimensions: Psychological wellbeing (PsPhW), self-esteem, family relationship, relationship with friends, resilience, physical well-being, autonomy and sentimental life, each scoring from 1 to 5. The higher the score, the better QoL (Boyer et al., 2010). Cronbach's alpha was 0.79 to 0.92 (Boyer et al., 2010). Cronbach's alpha coefficients for the Arabic translated version was 0.88, and CVI was 0.86% (Hasan et al., 2015).

2.7. Data Analysis

Data were analysed using the statistical package for social sciences version 23 for Windows. The first stage of the quantitative data analysis described participants' responses to the variables. The next stage employed descriptive statistics such as frequency, mean and standard deviation to analyse social demographic characteristics, and clinical and psychosocial characteristics. The third stage used Pearson or Spearman's product-moment correlation test to examine the association between QoL variables and social demographic, clinical and psychosocial characteristics. We used clinical variables showing significant correlation in stepwise forward multiple regression analyses to identify which variables were the best predictors of QoL. In respect to multi-comparison tests to guard against wrongly rejecting a null hypothesis and type 1 error, we adjusted the level of significance. The adjusted level of significance set at baseline for all statistical tests was thus determined at the 1% level ($p < 0.01$) (Field, 2009b; Stevens, 2009; Tabachnick et al., 2001). We conducted cluster analysis to the reduce number of levels when the variables had more than two levels (Field, 2009a; Tabachnick and Osterlind, 2011). All variables were entered into regression model and investigated the correlation each studied variable with quality of life subdomain.

2.8. Results

We recruited total of 157 people with schizophrenia according to DSM-V in the period between August 2015 and February 2016. Initially, 254 participants were invited to take part in the study. However, 97 refused to cooperate or follow the study directions; nine were excluded as they had limited comprehension ability and six participants did not respond to the research team's contact. The sample size was calculated to detect correlation between variables with a medium effect size at

Table 1
Characteristics of the study participants.

Characteristics	Frequency %	
Age, years (M, SD)	(35.6, 6.6)	
Gender		
Male	40	25.4
Female	117	74.6
Education level		
Primary school or below	43	27.3
Secondary school	52	33.1
College or above	62	39.4
Employment status		
Employed	37	23.5
Unemployed	95	60.5
Others	25	15.9
Marital status		
Married	23	14.6
Single	97	61.7
Divorced	15	9.5
Others	22	14
Illness duration at baseline in years (M, SD)		
≤2	85	54.1
3–5	37	23.6
≥5	35	22.2
Number of previous Hospitalisations		
<1	58	35
≥1	99	65
BMI (score)	(24.34, 5.7)	60
Antipsychotic medication		
Atypical	95	40
Typical	62	

Table 2
Characteristics of the clinical variables of the study.

Clinical variable	Mean	SD
KASQ	14.7	4.4
PANSS		
Positive syndrome	15	5.4
Negative syndrome	37	4.6
Depression	17	3.8
Anxiety	11	4.3
Social support		
Family	27	2.3
Friends	12	1.98
Significant others	14	2.76
DIEPSS	31	3.07
Social support		
Quality of life		
PSW	66.66	31.04
SE	70.0	29.43
RFa	60.0	32.45
RFr	70.0	29.76
RE	73.3	27.37
PhW	60	30.34
AU	60	29.99
SLE	70	32.45

0.80 power, level of significance of 0.05 (Cohen J, 1992). The participants' characteristics are summarised in Table 1; the majority were female, single, unemployed, with an average age of 35.6. More than two-thirds of the participants reported recurrent admission to the psychiatric hospital before the study, and a similar proportion had attained secondary level of education or higher.

2.9. Bivariate Analysis findings

2.9.1. Correlation between QoL and socio-demographic characteristics

The analysis showed a significant negative correlation between QoL scores and age, as well as with male participants and a high BMI value ($p < 0.05$); there was also a significant negative correlation between QoL scores and illness duration ($p < 0.05$). Furthermore, a positive significant relationship was detected between QoL and marital status. The result of correlation between QoL and being employed ($r = 0.37$), having less previous hospitalisation ($r = -0.46$) and receiving a typical antipsychotic medication ($r = 0.38$) were positively significantly correlated with QoL. However, no significant relationship was found between QoL and years of education.

2.10. Correlation between QoL and clinical variables

2.10.1. Knowledge level of schizophrenia

The correlation between each sub-scale score of the QoL and the knowledge score was examined. The knowledge level was significantly positively correlated with QoL scores ($p < 0.05$).

2.11. Severity of psychiatric symptoms

Surprisingly, analysis of the results revealed no significant relationship between the dimensions of QoL and the positive syndrome of schizophrenia. However, a significant correlation was obtained between QoL and negative syndrome. Another significant correlation was found between QoL and depression and anxiety.

2.12. Drug-induced extrapyramidal symptoms

The relationship between each sub-scale score on the QoL and the DIEPSS score was significantly correlated ($r = -0.53, p < 0.05$). DIEPSS represents a general assessment of extrapyramidal symptoms. The results suggest that extrapyramidal symptoms affect QoL negatively. Therefore, psychiatrists should strive to minimise the side effects of antipsychotic medication. A similar finding indicated that drug-induced extrapyramidal symptoms had negative impact on QoL (Crossley et al., 2010). In addition, Davis et al. (2003) stated that patients who received typical antipsychotic medication experienced more side effects than from other typical medication.

2.13. Coping strategies

The type of coping mechanism employed has a direct relationship with the QoL score. The result demonstrated that negative coping strategies were negatively correlated with QoL sub-scales scores ($r = -0.36$, $p < 0.05$). Conversely, using the three positive coping mechanisms, devaluation, distraction and control of the situation, was significantly correlated with QoL sub-scale scores ($r = 0.38$, $p < 0.05$, $r = 0.56$, $p < 0.05$; $r = 0.46$, $p < 0.05$, respectively).

2.14. Stepwise regression analysis

The results of stepwise regression analysis on the QoL scale subdomains are summarized in Table 4. All variables showing a significant relationship were entered into the regression equation. The findings revealed that employment status, marital status, negative symptoms of schizophrenia, knowledge level, anxiety, depression, BMI, negative coping mechanism and side effects of antipsychotic medication were significant predictors of the QoL.

3. Discussion

To the best of our knowledge, this is the first study designed to examine the quality of life determinants among people with schizophrenia using specific QoL instruments at an international level and in Arab speaking countries. The current study's QoL scores were higher than those reported elsewhere for schizophrenia patients (56 vs 47) (Bechdolf et al., 2014; Fujimaki et al., 2012). This result may be explained by the fact that participants in the current study were recruited

Table 3
Bivariate correlation between QoL subdomains and objective indicators (Pearson, Spearman coefficient).

	PSW	SE	RFa	RFr	RE	PhW	AU	SLE
Age	−0.43*	−0.32	−0.45	−0.37	−0.29	−0.14	−0.25	−0.17
Male	−0.53	−0.48	−0.29	−0.38	−0.28	- 0.52	−0.48	−0.57
Education level	0.38	0.54	0.48	0.23	0.19	0.30	0.42	0.36
Employment status	0.37*	0.28	0.43*	0.52	0.18	0.35*	0.42*	0.52*
Marital status	0.37*	0.52	0.47 *	0.28*	0.51*	0.47*	0.19	0.33
Illness duration	−0.33*	−0.41*	−0.53	−0.62	−0.38	−0.29*	−0.53*	−0.47
Number of previous hospitalisations	−0.46*	0.37	−0.43	−0.28*	−0.39	−0.26	−0.19*	−0.34
BMI	−0.55*	−0.38*	−0.65	−0.48*	−0.58	−0.46*	−0.39	−0.64
Atypical antipsychotic medication	0.45*	0.37	0.52	0.48	0.38	0.29*	0.36	0.33
KASQ	0.48*	0.37*	0.48*	0.36*	0.63*		0.34*	
PANSS								
Positive syndrome	−0.45*	−0.37*	−0.28*					
Negative syndrome	−0.56*	−0.47*	−0.51*	−0.63*		−0.39*		−0.48*
Depression	−0.44*	−0.53*	−0.28*	−0.56*	−0.33*	−0.46*	−0.48*	−0.19*
Anxiety	−0.35*	−0.46*	−0.48*	−0.38*	−0.51*	−0.47*		
Coping strategies								
SCO Positive coping 1: devaluation			0.46*	0.37*				
SCO positive coping 2: distraction	0.46*		0.38*	0.29*				
SCO positive coping 3: stress control	0.46*	0.38*	0.28*	0.34*		0.45*	0.63*	0.57*
SCO negative coping	−0.36*	−0.28*	−0.53*	−0.38*	−0.56*	−0.48*	0.49*	
DIEPSS	−0.44*	−0.38*	−0.28*	−0.43*	−0.61*	−0.54*	−0.43*	−0.37*

* < 0.05

from the outpatient clinic and were more stabilised than those being treated in a psychiatric hospital. The findings of the current study are crucial as the previous studies used the generic QoL scales based on experts' or physicians' points of view (WHOQOL, Modular System for Quality of Life scale, subjective QoL scale), which may be entirely different from the people diagnosed with schizophrenia views. Likewise, Richieri et al. (2011) reported that the QoL dimension for people with schizophrenia is different from that of other chronic illnesses, due to the very nature of the illness.

The majority of the current study sample was female, as recruitment of male patients with schizophrenia is challenging and showed a higher attrition rate. In addition, the research assistants in this study were female nurses, which might contribute to recruiting female participants. Studies investigating the effect of antipsychotic medication on people with schizophrenia showed that the first generation of this medication was associated with a greater negative impact on male patients than females (Naber and Lambert, 2009). This might explain why the majority of the study sample was female. The present study was conducted in outpatient clinics, as the majority of people with schizophrenia have received treatment here since the start of the de-institution movement (WHO, 2008). The findings of the current study indicated that the strongest predictors of QoL were negative symptoms of schizophrenia, depressive symptoms, anxiety, coping strategies and presence of extrapyramidal symptoms, given that some variables had significantly stronger associations on some measures than others. Thus, people with schizophrenia who had adequate knowledge about their condition may have a good relationship and believe their actions largely determined events and supported them with appropriate resources to overcome demands and conflict. As a result, they might have changed a hopeless view of life into a more meaningful one. This result is consistent with that of a previous report, which found that family caregivers of people with schizophrenia who had higher scores for a sense of coherence also showed a higher QoL score (Mizuno et al., 2012). The lack of knowledge appeared to be confused with self-guilt, shame at the illness and a sense of helplessness and hopelessness. Alternatively, this may have reduced the self-efficacy and self-esteem of participants. This conclusion is in line with those of Lysaker et al. (2006) and Sibitz et al. (2011), who argued that poor awareness of schizophrenia was associated with internalisation, stigma and stereotyping of people with schizophrenia, which led to depression. Likewise, Pickett et al. (2012) and Alegría et al. (2008) found poor knowledge of mental illness was linked with low self-efficacy and empowerment levels, which contributed to experiencing negative psychological effects of self and social stigma as well as using negative coping strategies with secrecy and avoidance of illness. Likewise, published studies revealed that people diagnosed with schizophrenia experienced more negative impact of stigma than other firm of mental illness (Hasan and Musleh, 2017; Rayan and Obiedate, 2017a). This result echoed in the study of (Corrigan et al., 2012), who reported there was a significant correlation between stigma associated with mental illness and quality of life among people diagnosed with schizophrenia

In recent years, more attention has been paid to the QoL of people with schizophrenia. It has been suggested that psychiatric symptoms have a greater influence on their QoL than cognitive deficit (Fujimaki et al., 2012). Unexpectedly, the result of our study revealed that the positive symptoms of schizophrenia had a significant correlation with all sub-domains of QoL. This outcome is contrary to that of Fujimaki et al. (2012) who found positive symptoms of schizophrenia did not correlate with QoL scores. This discrepancy could partially be attributed to the fact that the majority of our study participants were at an acute stage of illness (Bechdolf et al., 2014) and they might experience recurrent episodes of hospitalisation before being stabilised; the Fujimaki study participants had been in the chronic stage of the illness. Moreover, depression was another significant predictor of QoL. This supports the view that depression influences the patient's ability to retrieve information which could have an impact on aspects of the QoL (Xiang et al., 2008). The average age of the present study's participants was around 35 years, and individuals seek to implement their life plan at this age. However, when they perceive themselves unable to achieve their goals and the acute stage of their illness requires recurrent hospitalisation, this might cause them to feel inferior to other people and erode their personality.

Regarding the association between socio-demographic characteristics and QoL, the results of the current study indicated that people who were in employment perceived greater satisfaction with their life and had more relationships with friends. This, in turn, led to physical and psychological wellbeing. This result suggests that employment plays a key role in the daily life of the individual. This study's results largely support those previously reported, showing that occupation not only results in financial gain to the individual, but also promotes individual integration in the community and supports the perception of self-worth and growth (Chang et al., 2012; Kao et al., 2011). Interestingly, high QoL scores have been found among younger people with schizophrenia. This may be attributed to younger individuals not

Table 4
Stepwise Regression of the Predictors of Quality of Life.

	Independent variable	Adjusted R^2	β
PSW	Age	0.68*	0.38**
	Illness duration		0.53*
	Number of hospitalisations		0.36*
	BMI		0.34**
	Atypical antipsychotic medication		0.52*
	KASQ		0.27*
	PANSS (negative)		0.44*
	PANSS (depression)		0.37*
	Coping strategies: negative		0.28*
	DIEPSS		0.48**
SE	Number of hospitalisations	0.63*	−0.35*
	BMI		−0.53**
	KASQ		−0.46**
	PANSS (negative)		−0.63**
	PANSS (depression)		−0.37*
	DIEPSS		−0.56*
RFa	PANSS (negative)	0.71*	−0.46**
	PANSS (depression)		−0.64*
	SCO negative coping		−0.38*
	DIEPSS		−0.56**
RFr	PANSS (negative)	0.65*	−0.45**
	PANSS (depression)		−0.48*
	SCO positive coping: devaluation		0.63*
	SCO negative coping		−0.52*
	DIEPSS		−0.39*
RE	KASQ	0.58*	0.52*
	PANSS (depression)		−0.48*
	PANSS (anxiety)		−0.37*
	SCO negative coping		−0.43*
PhW	Illness duration	0.58*	−0.36*
	BMI		−0.28*
	PANSS (negative)		−0.43*
	PANSS (depression)		−0.51*
	PANSS (anxiety)		−0.40
	SCO positive coping 3: stress control		0.57
	DIEPSS		−0.35
AU	Illness duration	0.72*	−0.41*
	Number of hospitalisations		−0.64*
	KASQ		−0.56*
	PANSS (negative)		−0.54*
	SCO positive coping 3: stress control		0.34*
SLE	Illness duration	0.67*	−0.54*
	PANSS (negative)		−0.47**
	PANSS (depression)		−0.29*
	SCO positive coping 3: stress control		0.38*
	DIEPSS		−0.34**

* < 0.05

perceiving a great variation between expected aspirations and reality, as compared with their elders who perceived less unfavourable prognosis, increasing the likelihood of dissatisfaction with their QoL (Kao et al., 2011).

The apparent overlap between the type of antipsychotic medication and QoL scores is comparable to other studies (Romm et al., 2012; Spielmans et al., 2013). Typical forms of antipsychotic medication yield more serious and undesirable side effects. This is reflected in the current study in the DIEPSS scores. It could be partially explained by the fact that patients lack interpersonal communication which adversely affects their ability to establish and sustain social relationships. In addition, public stigma and misconceptions attached to these side effects might reduce self-esteem and self-confidence in patients (Wittorf et al., 2013).

The findings of this study have important clinical implications. They emphasise the necessity of understanding and treating not only the core symptoms of schizophrenia but also the primary factors influencing changes in QoL over time. In order to adjust the clinician's goals to the patients' subjective needs, psychosocial intervention and rehabilitation programs should be directed to promote feelings of self-efficacy (empowerment), self-esteem, social support, and utilisation of adjusting and/or coping strategies as well as to support patients and their carers during the process of social adaptation in the early phase of the disease. Future studies should examine the effect of cognitive and emotional impairment on the appraisal of perceived QoL in schizophrenia.

The strength of the current study is the large number of patients recruited, and their random selection. However, this study has drawbacks. First, it recruited clinically stable patients with schizophrenia from the main outpatient clinics in Amman, so this finding may not be applicable to other parts of Jordan and to patients with different characteristics. Second, the percentage of female subjects was over-represented in the sample. Thus, the results need to be interpreted with caution. Third, the nature of the study design cannot examine the causality relationship between QoL and clinical variables. Finally, this study did not assess cognitive related function and its impact on quality of life.

4. Conclusion

The relationship between clinical variables and QoL was examined in outpatients, using specialised outcome measures. The results indicated that schizophrenia is a very demanding illness that interferes with patients' QoL. The findings identified the deleterious impact of poor knowledge about schizophrenia, typical forms of antipsychotic medication, extrapyramidal symptoms, psychiatric symptoms, duration of the illness and recurrent hospitalisation on QoL. Regarding further work, more qualitative studies are needed to explore the subjective quality of life and its determinants.(Tables 2 and 3)

Conflict of interests

Authors declare that they have not conflict of interests.

Funding

No funding was received to conduct the study.

Ethical approval

Ethical approval was obtained from the Scientific Research Committee of the Ministry of Health in Jordan. In addition, a consent form was obtained from every participant.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.09.062.

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