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# Quality of life, symptom severity and level of functioning in people with severe mental illness ready for hospital discharge

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**Key words:** severe mental illness; quality of life; symptom severity; functioning; cross-sectional study

## **Quality of life, symptom severity and level of functioning in people with severe mental illness ready for hospital discharge**

### **Relevance Statement:**

There is a lack of information on the levels of quality life and functioning of Asian people with severe mental illness immediately before hospital discharge, even though such information has major implications for psychiatric rehabilitation. The study findings highlight that mental health professionals should consider interventions beyond the traditional focus on psychopathology to improve functioning in people with SMI recently discharged from hospital. These should focus on improving social relationship functioning, supporting employment, and minimising the development and impact of physical illnesses. These interventions should be considered when preparing service users for hospital discharge and continued in the community setting.

**Abstract:****Introduction**

There is a lack of evidence on quality of life (QoL) and functioning in Asian people with severe mental illness (SMI) immediately prior to hospital discharge. This information could have major implications for treatment.

**Aim**

To profile perceived quality of life, symptom severity and level of functioning among people with SMI.

**Methods**

A cross-sectional study involving 347 adult inpatients with SMI. QoL (WHO Quality of Life - Brief Form), symptom severity (Positive and Negative Syndrome Scale) and level of functioning (Specific Level of Functioning) were measured immediately pre-discharge.

**Results**

Participants reported low social relationship-related QoL. Weak correlations were found between functioning, QoL and symptoms. Regression analysis identified the social relationship QoL domain, employment status, education level, living situation, physical illnesses, overall symptoms and the duration of receiving psychiatric services were statistically significant predictors of functioning levels.

**Discussion**

The findings may highlight a need for interventions beyond the traditional emphasis on psychiatric symptoms in order to improve functioning following an inpatient admission.

**Implications for practice**

Interventions to improve functioning in recently discharged people with SMI may need to be specifically designed to improve patients' social relationships, support return to employment and minimise the risk of physical illness.

## **Accessible Summary**

### **What is known on the subject?**

- The quality of life (QoL) of people with severe mental illness (SMI) is a growing international concern.
- Many earlier studies report the determinants and correlates of QoL and functioning in people with SMI in Western countries.
- The QoL and functioning of Asian inpatients with SMI are largely unknown, particularly at the point where they have been assessed as being ready for hospital discharge.

### **What the paper adds to existing knowledge?**

- Physical health, social functioning and community living skills, and negative symptoms are important areas of concern immediately pre-discharge.
- Social relationship related QoL, overall symptoms, unemployment, education level, living situation, physical illness and treatment duration predict functioning levels.

### **What are the implications for practice?**

- Mental health nurses should consider interventions beyond the traditional focus on psychopathology to improve functioning outcomes in people with SMI recently discharged from hospital.
- Inpatient services should utilise the opportunity to monitor and address physical health problems before discharge from inpatient care.

## **Quality of life, symptom severity and level of functioning in people with severe mental illness ready for hospital discharge**

### **Introduction**

Mental health problems are common and a leading cause of disability (Steel et al., 2014). Worldwide, an estimated 300 million people are affected by depression, about 60 million by bipolar affective disorder and about 23 million with schizophrenia, excluding those with other psychoses (WHO, 2018). Mortality is significantly higher among people with mental health disorders (particularly among those with severe mental illnesses) than the general population, accounting for 8 million deaths each year, and around 10 years of potential life lost per person (Walker et al., 2015). Thus, mental health problems impose substantial human, social and economic burdens on individuals, families, communities and societies as well as healthcare and social services. Unfortunately, many services are ill-equipped to respond adequately, with the result that there is poor quality of care for many of those who do receive treatment. Severe mental illnesses (SMI) include schizophrenia, bipolar disorder, schizoaffective disorder and major depressive disorder (Ritsner et al., 2012). In Hong Kong, with a population of over 7 million, extrapolation from worldwide data would indicate that between 70,000-200,000 people have a SMI (Hong Kong Hospital Authority, 2011).

The quality of life (QoL) of people with mental disorders has been a growing international concern in mental health services. Health-related quality of life is affected in people with mental illness (Choo et al., 2017) and some studies also show that QoL is related to levels of subjective recovery (Temesgen et al., 2019). As patients with SMI have a particularly poor QoL

(Ritsner et al., 2012; Saharinen et al., 2011) and QoL measures are considered useful for care planning and evaluation (Trompenaars et al., 2006), healthcare providers should pay particular attention to enhancing the QoL of this population.

Correlations among QoL with symptom severity and level of functioning are well established (Kuehner and Huffziger, 2009; Trompenaars et al., 2006). For example, reducing symptoms (all types) is associated with higher QoL (van de Willige et al., 2005) and a systematic review conducted by Eack and Newhill (2007) suggested that psychotic symptoms in schizophrenia were significantly negatively related to all domains of QoL. Other studies have also shown that positive symptoms (such as hallucinations) are more strongly correlated with QoL than negative symptoms such as avolition and low creativity (van de Willige et al., 2005). Also, reduced QoL can be attributed to the side-effects of medication (Harvey et al., 2004) or symptoms of depression (Nørholm and Bech, 2006).

Although much research has been done regarding the determinants and correlates of QoL and functioning in people with schizophrenia and major depression in Western countries, little is known about this among all kinds of severe mental illness in Asian populations, including Hong Kong. A literature search revealed a dearth of studies with those available focused on community-dwelling people with SMI, after discharge from a psychiatric hospital and under community rehabilitation services (Cheung, 2001; Lee, 2008). Therefore, the QoL and functioning of inpatients with SMI starting from the point where they are considered ready for hospital discharge is largely unknown, even though such information can have major



implications for their psychiatric rehabilitation post-discharge. This is also an important gap in understanding about this topic because considerable differences have been observed between Western and Asian countries on patient outcomes in SMI (Holla and Thirthalli, 2015); and conflicting findings of factors associated with QoL in SMI are reported in/between Asian and non-Asian settings (Choo, 2017). A clearer understanding of these issues would help mental health nurses, senior managers and policymakers focus both inpatient and community psychiatric services on the most important areas of QoL that require improvement immediately post-discharge and hence promote recovery and reduce disability.

Therefore, this study aimed to understand the factors affecting the functioning, QoL and mental health state of inpatients with SMI one week before hospital discharge. The objectives were to: (i) collect data to profile QoL, symptom severity, and level of functioning of a cohort of people with severe mental illness; and (ii) examine the relationships among demographic characteristics of people with severe mental illness, their QoL, symptom severity, and level of functioning.

## **Methods**

A cross-sectional correlational study was conducted through face-to-face interviews to profile perceived QoL, symptom severity and level of functioning among hospital in-patients with SMI one week before their planned discharge.

## **Sample**

A convenience sample of in-patients who met the following inclusion criteria was invited to participate in the study upon their planned discharge: (1) Hong Kong Chinese, (2) aged 18 to 65 years, (3) suffering from schizophrenia or other psychotic disorders using the consensus diagnosis according to the American Psychiatric Association DSM IV-TR, (4) one week before planned hospital discharge and (5) gave their voluntary consent. Patients were excluded from the study if they were: (1) suffering from a personality disorder, organic brain disease or learning disability, and (2) transferring to a general hospital for physical treatment.

The study was conducted in a large regional psychiatric hospital in Hong Kong providing comprehensive multidisciplinary inpatient services and community psychiatric care for a local population of around 1.2 million people. The 1,400-bed hospital consisted of 24 wards, in which approximately 970 patients with severe mental illness (SMI) were inpatients under treatment at subject recruitment.

### **Sample size calculation**

A conservative minimum sample size required was determined based on the planned regression analysis. Considering that we would insert 17 demographic and clinical predictor variables into the multiple linear regression model, and using a widely accepted rule of thumb that 20 participants are required for each predictor variable (Stevens, 2009), we estimated that it required around 340 participants to ensure adequate study power of 0.80. However, given the likelihood of a low response rate and improving the representativeness of the study, we recruited as many participants as possible over one year of data collection.

## **Measures**

### **Socio-demographic data**

Demographic data such as age, gender, employment status, educational level, type of residence and medical information (primary psychiatric diagnosis, duration of the illness, treatment and services received including nature and frequency) were recorded.

### **World Health Organization Quality of Life – Brief Form (WHOQOL-BREF)**

QoL was measured using the WHOQOL-BREF (Chinese version) which is comprised of two general items and 26 items in four specific domains: physical (seven items), psychological (eight items), social relationship (three items) and environment (eight items). The transformed scores of the four domains range from 4 to 20. Two separate individual items with a global focus (overall quality of life and general health) are also calculated on a scale of 1-5. Higher scores indicate better QoL. The Chinese WHOQOL-BREF has shown good internal consistency, test-retest reliability, and construct validity in studies in Hong Kong and Taiwan (Leung, 2005; Sung and Yeh, 2007).

### **Positive and Negative Syndrome Scale (PANSS)**

Symptom severity was measured using the PANSS, an established rating scale in patients with schizophrenia (Kay et al. 1987). The scale has seven positive-symptom items and seven negative-symptom items. There are also 16 items designed to measure general psychopathology symptoms, which covers a broad evaluation of positive, negative and other

symptoms like aggression, thought disturbance and depression. The measure uses a 7-point Likert scale. It has good to excellent inter-rater reliability, good internal consistency, good to fair test-retest reliability, and good concurrent and predictive validity (Bell, 1992) and has been used in studies of psychopharmacological treatment, cognitive functioning and course of illness (Kay et al. 1987). All research nurses who rated PANSS in this study were experienced in using the instrument and had previously received specific training on how to use the scale, however we did not formally establish inter-rater reliability as part of this study.

### **Specific Level of Functioning (SLOF)**

Level of functioning was measured using the SLOF, a 43-item assessment scale grouped into six subscales: physical functioning; personal care skills; interpersonal relationships; social acceptability; activities of community living; and work skills (Schneider and Struening, 1983). Each of the questions in the above subscales is rated on a 5-point Likert scale (1 = poorest function, 5 = best function). The scale has been reported to have good psychometric properties in Chinese populations of people with SMI (Chien et al., 2006) and has been adopted by major psychiatric hospitals/units in Hong Kong since 2002. This scale is commonly used to evaluate psychosocial functioning in this patient group, reflecting their abilities to maintain their satisfactory performance of daily life and social activities in the community (Bowie et al., 2006). The scale is considered to be appropriate to assess health outcomes because lessening of symptoms and the reduction of relapse rates of SMI patients contributes to improve real-life functioning (San et al., 2007), which can reflect their cognitive and social competence (Bowie et al., 2006). Similarly to the PANSS, the nurse raters were trained how to use the SLOF and had

extensive experience using the instrument in their clinical practice, but we did not test inter-rater reliability.

### **Data collection and analysis**

Data were collected over one year between August 2011 and July 2012. Initially, potential participants who met the inclusion/exclusion criteria were identified by the trained research nurses after screening the patient lists and consulting with clinical staff. Subsequently, the research nurses (who had no role in the day-to-day provision of clinical care) facilitated the informed consent procedures and collected data from consenting patients via face to face interviews.

All data were coded and anonymized in the computerized data set. Missing data were imputed using group means. Descriptive statistics (mean, SD, range) were conducted to summarise the demographics, clinical characteristics and study outcome measures. Pearson correlations were conducted to examine relationships between patients' level of functioning with both symptoms and QOL.

We utilised multiple linear regression to address study objective II (examine the relationships among demographic characteristics of people with severe mental illness, their QoL, symptom severity, and level of functioning). After transforming all categorical variables into dummy variables and performing relevant screening procedures to ensure that assumptions were not violated (tolerance range 0.41 to 0.94; VIF range 1.06 to 4.43), linear regression analysis was

performed to identify significant predictors of patients' functioning levels (SLOF total score). The recorded demographic/clinical characteristics, PANSS total score and the four WHOQOL-BREF domains were inserted as predictor variables. Data were analysed using SPSS version 26. Statistical significance was set at  $p < 0.05$ .

### **Ethical considerations**

The study was approved by the relevant cluster research ethics committee of the Hong Kong Hospital Authority (NTWC/CREC/806/09) and the Human Subjects Research Ethics Committee of the University before recruitment. All participants were provided with written information about the study, given adequate time to consider their voluntary participation and informed that declining to take part would have no negative impact on their routine treatment. All participants provided written informed consent and were assured that they could withdraw from the study at any point without needing to provide a reason.

### **Results**

A total of 600 patients who met the inclusion criteria were invited to participate in the study by the research nurses. Of these, 253 declined to take part. Finally, 347 (199 men, 148 women) in-patients aged from 18 to 64 (mean 41.6) years agreed to participate in the study and completed the measures (a response rate of 57.8%). The majority of them were suffering from schizophrenia (62.5%,  $n=217$ ) and the rest from major depression (13.8%,  $n=48$ ), bipolar disorder (13.3%,  $n=46$ ), and psychotic disorders (6.6%,  $n=23$ ). The majority of participants were unemployed during the time of the interviews (73.5%,  $n=255$ ). Most had received secondary

school education or above (81.0%, n=281). Their duration of hospitalization ranged from 2 to 180 days (mean 33.6) and duration of receiving mental health services ranged from 1 to 507 months (mean 131.1). Among them, 105 (30.3%) patients had a co-morbid physical illness (Table 1).

In terms of QoL, patients reported a lower perceived QoL in the social relationship and psychological health domains than the physical health and environmental ones. In terms of symptoms (item mean scores), patients reported more severe general psychopathology symptoms than negative and positive ones (the three most severe general symptoms were anxiety, guilt feeling, and lack of judgment). In terms of aspects of functioning (standardised mean scores), patients reported that their skills in self-maintenance were better than their skills in social functioning and community living skills (Table 2).

Pearson correlation analyses (Table 3) indicated that the PANSS total score and all subscales had significant weak negative correlations with SLOF total score ( $r=0.22$  to  $0.46$ ); with negative symptoms having the strongest relationship. Similarly, all the QoL domain scores were significantly, but weakly correlated with SLOF total score ( $r=0.14$  to  $0.21$ ). However, the two individual items of QoL (overall health and overall QoL) were not significantly correlated to SLOF total score.

Regression analysis (Table 4) indicated seven statistically significant predictors of functioning levels. Living alone ( $p=0.21$ ), physical illness ( $p=0.043$ ), longer history of receiving psychiatric

services ( $p=0.002$ ) and PANSS total score ( $p<0.001$ ) predicted worse functioning. Whereas, being employed ( $p=0.012$ ) and a higher level of education (secondary school or above) ( $p=0.005$ ) predicted a better level of functioning. The final regression model explained 36% of the variance in SLOF total score.

## **Discussion**

To the best of our knowledge, this study is the first of its kind to be conducted in Hong Kong, and one of the few of a non-Western population to examine the relationship between QoL, symptom severity and level of functioning among in-patients with a severe mental illness who are about to be discharged from hospital.

### *Levels of functioning, symptoms and quality of life*

The participants' levels of specific functioning in the current study were found to be generally suboptimal, but better than some other studies conducted with people diagnosed with SMI living in the community. For example, a multi-centre study involving 921 Italians with a psychotic illness reported mean subscale SLOF scores of 45.91 (SD=8.5) for activities, 20.00 (SD=6.1) for work, and 22.31 (SD=6.0) for interpersonal relationships. Whereas the current study had subscale mean scores of 46.19 (SD=5.24), 22.57 (SD=6.88) and 30.03 (SD=4.72) respectively. Similarly, the total mean SLOF score (173.24; SD=15.02) is far higher than the mean scores recorded at baseline in a Hong Kong study of a mindfulness-based intervention (Chien and Thompson, 2014) conducted with 105 people with schizophrenia (range 133.8 to



138.1; SD range 13.8-18.3). However, the two-year follow-up mean total SLOF score in the intervention group in Chien and Thompson's (2014) trial was reported as 176.9 (SD=22.1), which is very similar to the current study and thus may suggest that participants of the current study had responded relatively well to their inpatient treatment in terms of their functioning. Conversely, the levels of symptoms reported by participants in the current study were quite high (PANSS total score of 112.46; SD=23.41). This degree of psychopathology was found to correspond with a clinician rated severity of "severely ill" (using the Clinical Global Impressions Scale (CGI-S); Guy, 1976) within a secondary analysis of seven multicentre antipsychotic drug trials involving over 4,000 participants with schizophrenia (Leucht et al., 2005).

In terms of QoL, the social relationship domain score in this study was marginally lower compared with a previous study in Hong Kong of outpatients with schizophrenia (Xiang et al., 2007). Xiang and colleagues (2007) reported a mean social relationship QoL score of 12.76 (SD=2.66), compared to the score of 10.70 (SD=3.12) in the present study. A possible reason is that hospitalization limited the opportunity to enhance or maintain patients' social activities and social functioning. Support for this notion is provided by Hansson (2006), who found that patients in community care settings had a better subjective QoL than patients in hospital settings. Conversely, Adewuya & Makanjuola (2009), who also used the WHOQOL-BREF to investigate the QoL of Nigerian schizophrenia outpatients, reported raw scores for overall QoL of 2.81 (SD = 1.05) and a raw mean score for overall health of 2.94 (SD = 1.12). Whereas, the overall QoL score of 4.21 (SD=0.91) and the mean health score of 4.15 (SD=1.06) in the current study are far higher than those reported by Adewuya & Makanjuola. These large differences in

QoL are a little surprising given that the Nigerian participants were living in the community and those in the current study were still hospitalised. This finding may be explained by the fact that Nigeria is an economically poor country in which access to adequate community-based healthcare is severely limited (Gureje et al., 2008) or perhaps because psychiatric care in Hong Kong is more advanced than Nigeria and although participants in the current study were inpatients, they were assessed as being ready for discharge to the community.

#### *Relationships between patients' functioning and symptom severity*

We found using bivariate correlations that there was only a weak relationship ( $r = -0.23$ ) between positive symptoms and functioning, whereas negative and general psychopathology symptoms had stronger correlations with the SLOF total score ( $r = 0.47$  and  $0.37$  respectively). These results seem to be in accordance with an earlier Taiwanese study (Lin et al., 2013) that reported significant relationships between negative symptoms and functional outcomes, where negative symptoms were found to mediate the relationship between social cognition and neurocognition on functioning outcomes. Negative symptoms have also been reported to be associated with poor functional outcomes in people with schizophrenia after controlling for potential secondary sources of negative symptoms (i.e. anxiety, depression, antipsychotic side effects) and cognitive deficits in a range of studies (Fervaha et al., 2014; Konstantakopoulos et al., 2011; Perlick et al., 2008; Rabinowitz et al., 2012), highlighting the central role these symptoms have in influencing functional outcomes. The importance of monitoring and relieving negative symptoms to improve patient outcomes, including to reduce the risk of

rehospitalisation, was also recently illustrated in a retrospective study involving 450 people with schizophrenia spectrum disorders (Vita et al., 2019). This study investigated how the clinical profile of patients at the point of discharge from acute inpatient care was associated with the use of services over one-year follow-up, the findings revealed that number and duration of rehospitalisations were highest in those participants with more severe negative symptoms at discharge (Vita et al., 2019).

#### *Predictors of patients' functioning levels*

We found statistically significant but weak, bivariate correlations between different aspects of patients' QoL and symptoms with specific functioning levels. Regression analysis further identified that the social relationship domain of the WHOQOL-BREF, patients' employment status, education level, living situation, physical illnesses, overall symptoms and the duration of receiving psychiatric services were statistically significant predictors of specific functioning levels. Not surprisingly, employed patients may indicate better levels of social acceptability and more financial security (Choi et al., 2020; Na & Lim, 2020). Similarly, without physical illnesses and a better QoL, it is to be expected that patients will have better levels of functioning (Malhotra et al., 2016). Also, to some degree, individuals with a higher education level may have better performance in their work and daily lives, and consistent with previous studies (Li et al., 2007; McIntosh et al., 2011; Xiang et al., 2010), our results showed that education exerted a significant influence on functional capacity. Among the Chinese community, attaining a high level of education is much prized and this may influence functional outcomes of

people with SMI differently to other populations. Therefore, further research among Chinese populations of people with SMI should include consideration of their educational attainment.

### *Potential intervention targets*

Physical illness, social relationship related QoL, overall symptoms, living situation and employment status were potentially modifiable variables predicting patients' functioning levels, and therefore these factors may warrant greater attention as targets for intervention. Recent systematic reviews provide evidence that such targeted interventions have great potential to improve the physical health and employment status of people with schizophrenia (Vancampfort et al., 2019; Modini et al., 2016; Hjorth et al., 2014). For example, a meta-review of meta-analyses of randomized controlled trials to improve physical health state of patients with schizophrenia, including a total of over 47,000 participants (Vancampfort et al., 2019), demonstrated that non-pharmacological interventions such as lifestyle counselling and psychoeducation resulted in large effect sizes in weight reduction (SMD>0.9), however this review did not include employment related outcomes. Nonetheless, a systematic review and meta-analysis of individual placement and support vocational rehabilitation programmes (Modini et al., 2016) reported that they were effective interventions to facilitate a return to competitive employment in people with SMI across a variety of international settings with different economic conditions.

Our findings of the relationships between physical illness and reduced functioning may suggest

that interventions targeting the encouragement of physical inactivity and reduction of sedentary behaviour are warranted to provide a comprehensive treatment package to enhance overall functional recovery. For example, people with SMI spend on average 8 hours per day being sedentary during waking hours and are significantly more sedentary than healthy controls: their mean amount of moderate or vigorous physical activity is about 38 minutes per day, being significantly lower than healthy controls (Vancampfort et al., 2017). However, people with severe mental illness face a range of barriers to engaging in physical activity and exercise, including high levels of perceived stress, low mood and a lack of self-confidence and poor social support (Firth et al., 2016). These barriers are often viewed as insurmountable by nurses who are involved in promoting the physical health of people with SMI (Hyland et al., 2003). In addition, a range of studies conducted in Asia (Bressington et al., 2018), the UK (Robson et al., 2013), Australia (Happell et al., 2013 ) and the USA (Knight et al., 2017) report that mental health nurses feel inadequately skilled to promote healthy lifestyles, highlighting a need to provide additional support and training for community-based mental health nurses for them to provide effective care.

As severe mental illness imposes a significant toll on individuals, families and communities and much of the burden is hidden, with premature deaths, unemployment, broken relationships, stigma and loss of self-esteem (Perry, 2014; Vigo et al., 2016; Brouwers, 2020), it is hardly surprising therefore that we found that this condition impacts adversely on QoL, symptoms and functioning. This indicates the need for careful individual assessment and interventions designed to address these aspects of functioning. The WHO's Mental Health Action Plan (2013-

2020; WHO, 2013) recognizes the importance of the provision of comprehensive, integrated mental health and social care services in community-based settings, the implementation of strategies for promotion and prevention, and strengthened evidence and research base. In addition, a recent review of psychiatric rehabilitation services highlighted that the design and effective implementation of evidence-based recovery-focused services requires strong leadership and the establishment of quality legislation, effective coordinated action by stakeholders and the creation of culturally appropriate services (Hill et al., 2019). Thus, interventions should be specifically designed to reach this vulnerable population, tailored to address contextual factors, health concerns or health behaviours by gender, race or ethnicity and to take account of considerations such as cultural sensitivity. Also, low socioeconomic status, low health literacy and low awareness of health resources may result in impeded recognition of symptoms, fewer contacts with the healthcare system and low adherence to recommended lifestyle and medication. Thus, creative strategies need to be adopted by mental health nurses and other social and healthcare professionals to overcome these barriers so that interventions may be effective in improving quality of life, diminishing symptom severity and enhancing functioning.

### **Implications for mental health nursing**

The findings of this study highlight that despite having low levels of positive symptoms and good self-maintenance skills, the social functioning and community living skills of participants were relatively poor. Also, having a lower level of social relationship related QoL was significantly related to lower levels of overall functioning in the regression model. These results, in

conjunction with some previously published studies, seem to indicate that community-based Hong Kong mental health nurses should place more emphasis on promoting the social integration/functioning of people with SMI following discharge from inpatient services to build upon the levels of functional recovery achieved during acute inpatient care. Focusing on improving social relationships could also have positive impacts on indicators of clinical recovery, such as readmission rates, because numerous meta-analyses have reported that social skills training interventions result in significant moderate improvements in hospitalisation rates over a one to two-year follow-up period (Morin and Franck, 2017). The study findings that physical illness predicted a lower level of overall functioning may also highlight that inpatient services should utilise the duration of inpatient contact to effectively assess and address physical health problems before discharge from inpatient care. If physical illnesses are identified before discharge an ongoing management plan could be drawn-up and handed over to community services to ensure continuity of care and access to relevant physical healthcare services.

### **Limitations**

This study has several limitations. This was a convenience sample limited to a local acute psychiatric hospital setting and therefore generalizability of the findings is limited. Similarly, participants in this study were about to be discharged and their health state is likely to be better than patients newly admitted. The response rate was only around 58%, thus further replication studies are warranted to substantiate the veracity of our findings. It is also possible that there was some variation in symptom measurement and assessment of functioning because although the nurse raters had received specific training and were experienced in using

the instruments, a formal test of inter-rater reliability was not conducted. In addition, this study has a cross-sectional design and precludes examination of the causality between the independent and dependent variables. Finally, the strength of significant correlations was relatively weak and the regression model only explained 36% of the variance in total functioning scores, therefore other extraneous variables are likely to influence functioning and the clinical relevance of these findings should be interpreted with some caution. Despite these limitations, the study findings provide important information that can be used by Hong Kong mental health nurses and other professional groups to direct community-based interventions towards improving newly discharged patients' levels of social functioning, QoL and physical health.

## **Conclusions**

Nurses, clinicians and policymakers should consider interventions beyond the traditional focus on psychopathology to improve functioning in people with SMI recently discharged from hospital. These should focus on improving social relationship functioning, supporting employment, and minimising the impact and development of physical illnesses. The regression model also revealed that the presence of physical illnesses, duration of receiving psychiatric services, being employed, living situation, overall level of psychopathology and education level appear to have a significant relationship with functioning levels. Thus, further research exploring the association of demographic data and clinical factors with level of functioning among this population is recommended.



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<b>Table 1</b> Demographic and clinical characteristics of patients (N=347)	
Characteristics	n (%)
<b>Psychiatric diagnosis</b>	
Schizophrenia	217 (62.5)
Psychotic disorder	23 (6.6)
Depression	48 (13.8)
Bipolar disorder	46 (13.3)
Others (e.g. Delusional disorder, hallucinosis)	13 (3.7)
<b>Gender</b>	
Male	199 (57.3)
Female	148 (42.7)
Age (Years)	Mean (SD) 41.6 (11.8) (range 18-64)
<b>Employment status</b>	
Employed (FT/PT)	74 (21.4)
Unemployed	255 (73.5)
Others (housewife, retired, student)	18 (5.2)
<b>Education level</b>	
No formal education	12 (3.7)
Primary school	54 (15.6)
Secondary school	241 (69.5)
University/Tertiary education	40 (11.5)
<b>Residential status</b>	
Living alone	63 (18.2)
Living with family/ relatives/friends	215 (62.0)
Others (Hostels, hospital, reluctant to tell)	69 (19.9)
No. of types of psychiatric medication used	Mean (SD) = 2.1 (1.08) (range=0-8)
No. of types of side-effects reported	Mean (SD) = 0.5 (0.86) (range=0-4)
<b>Religion</b>	
None	187 (53.9)
Christian/Catholic	106 (30.6)
Buddhism	30 (8.6)
Others (e.g. Ancestor worship, Taoism)	24 (6.9)
<b>Any other physical illness</b>	
No	242 (69.7)
Yes (e.g. asthma, chronic heart disease, or COPD)	105 (30.3)
Duration of receiving psychiatric treatment/service (Months)	Mean (SD) = 131.1 (130.6) (range=1-507)
The frequency of hospitalization (Days)	Mean (SD) = 3.5 (4.4) (range=0-32)
Duration of hospitalization (Days)	Mean (SD) = 33.6 (28.1) (range=2-180)

<b>Table 2</b> Patients' measured mean scores of health outcomes (N=347)		
Instruments & Score range	Raw mean score (SD)	Item mean score (SD, range)
<b>WHOQOL-BREF</b>		
Social relationship (4-20)	10.70 (3.12)	
Environment (4-20)	16.30 (4.21)	
Physical health (4-20)	15.52 (2.65)	
Psychological health (4-20)	14.10 (2.24)	
Overall QoL (1-5)	4.21 (0.91)	
Overall health (1-5)	4.15 (1.06)	
Positive and Negative Syndrome Scale (PANSS) -total score (30-210)	112.46 (23.41)	
Positive symptoms (7-49)	19.66 (9.83)	2.89 (1.90, 1-6)
Negative symptoms (7-49)	20.85 (8.86)	2.91 (1.98, 1-6)
General psychopathology symptoms (16-102)	67.82 (28.11)	4.30 (2.48, 1-7)
Specific Level of Functioning (SLOF)-total score (43-215)	173.24 (15.02)	
Self-maintenance (12-60)	53.34 (5.20)	4.44 (0.41, 2-5)
Physical functioning (5-25)	21.65 (3.26)	
Personal care skills (7-35)	31.69 (3.52)	
Social functioning (14-70)	57.34 (8.01)	4.09 (0.30, 2-5)
Interpersonal relationships (7-35)	30.03 (4.72)	
Social acceptability (7-35)	30.31 (4.59)	
Community living skills (17-85)	64.76 (10.11)	3.81 (0.62, 1-5)
Activities (11-55)	46.19 (5.24)	
Work skills (6-30)	22.57 (6.88)	



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**Table 3** Correlations between patient's QoL/symptoms and functioning (SLOF score)

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Pearson Correlation Coefficients	SLOF-total
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WHOQOL-Bref	
Physical health	0.211**
Psychological	0.192**
Social relationships	0.188**
Environment	0.145**
Overall QoL	0.062
Overall health	0.060
PANSS-total	-0.426**
Positive symptoms	-0.227**
Negative symptoms	-0.467**
General psychopathology symptoms	-0.368**

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\*P<0.05; \*\*P<0.01; \*\*\*P<0.001.