



REVIEW ARTICLE

## Quality of Life Scale and symptomatology of schizophrenic patients – A systematic review



L.M.G. de Pinho<sup>a,\*</sup>, A.M.S. Pereira<sup>a</sup>, C.M.C.B. Chaves<sup>b</sup>, P. Batista<sup>c</sup>

<sup>a</sup> Departamento de Educação e Psicologia, CIDTFF, CINTESIS, University of Aveiro, Aveiro 3810-193, Portugal

<sup>b</sup> Escola Superior de Saúde de Viseu, IPV, CI&DETS, Viseu 3500-843, Portugal

<sup>c</sup> Universidade Católica Portuguesa, Rua Diogo de Botelho, 1327, 4169-005 Porto, Portugal

Received 2 May 2017; accepted 8 August 2017

Available online 3 September 2017

### KEYWORDS

Schizophrenia;  
Quality of life;  
Functioning;  
Quality of Life Scale  
(QLS);  
Symptomatology

### Abstract

**Background:** The Quality of Life Scale (QLS) was developed to assess the quality of life of patients with schizophrenia, by Heinrichs, Hanlon and Carpenter, in 1984.

**Objectives:** This systematic review analysed the scientific evidence produced from the QLS results and its relationship with the symptomatology of patients with schizophrenia.

**Methods:** An electronic search was conducted on Pubmed/Medline and Scopus to identify relevant papers published within the last ten years (January 2007 to December 2016). The inclusion criteria were: studies whose samples included only outpatients with schizophrenia; studies whose aim was to compare the QLS results with the symptomatology of schizophrenia; studies written in English. The PRISMA criteria for reporting systematic reviews and meta-analyses were used.

**Results:** Twelve studies were included in this systematic review. A total of 1645 patients with schizophrenia from four different countries were analysed. Ten articles used a cross-sectional study methodology and 2 articles involved a longitudinal study.

**Conclusions:** Synthesis suggests that quality of life/functioning in patients with schizophrenia can be influenced by negative symptoms. Nevertheless, in relation to positive and depressive symptoms, the results are not congruent nor consistent. Therefore, this literature review indicated that more research is needed in order to obtain better evidence with regards to the influence of that symptomatology on the quality of life/functioning in patients with schizophrenia.

© 2017 Asociación Universitaria de Zaragoza para el Progreso de la Psiquiatría y la Salud Mental. Published by Elsevier España, S.L.U. All rights reserved.

\* Corresponding author.

E-mail address: [larapinho@ua.pt](mailto:larapinho@ua.pt) (L.M.G. de Pinho).

## Introduction

Schizophrenia is a severe mental disorder characterised by delusions, hallucinations, disorganised speech, grossly disorganised or abnormal motor behavior and negative symptoms. In most cases still appear cognitive impairments and affective symptoms. This pathology is associated with significant social and occupational dysfunctions.<sup>1</sup> These deficits are present in over 60% of patients with schizophrenia and normally arise during the first five years of the disease's progression.<sup>2</sup> The best predictors of the deterioration of social functioning seem to be negative symptoms.<sup>3</sup>

The symptoms of this mental illness are associated with economic, professional, social and functional difficulties in patients who have long hospitalisation periods, delayed recovery and poor treatment outcomes, which considerably damage their quality of life.<sup>4</sup>

For all these reasons, patients with schizophrenia have a poor quality of life as indicated in several studies.<sup>5–10</sup> Most of the recent studies related to the relationship between quality of life and the symptoms of schizophrenia indicate that negative and positive symptoms, as well as depression and anxiety, are related to a lower quality of life.<sup>5,8,11–14</sup> Other studies delve into the relationship between quality of life and socio-demographic characteristics, including age, employment and life conditions.<sup>6,9,14,15</sup>

There are many scales to evaluate the quality of life, but not all are appropriate for mental illness. The Quality of Life Scale (QLS) was developed by Heinrichs, Hanlon and Carpenter, in 1984, to assess the quality of life of patients with schizophrenia.<sup>16</sup> The QLS has been an important assessment instrument in a great deal of research. In a review of quality of life scales used in studies investigating the quality of life in patients with schizophrenia conducted from January 2009 to December 2013, the results demonstrate that the most widely used schizophrenia-specific quality of life scale was QLS.<sup>17</sup> In addition to assessing the quality of life, the QLS is recurrently used to assess functional outcomes in schizophrenia<sup>18</sup> and is the most widely used scale in research on assessing functioning.<sup>19</sup> The QLS stands out from the other scales as it measures the functioning of patients with schizophrenia and considers negative symptoms, regardless of the presence or absence of positive symptoms. This instrument assesses personal experience, the quality of personal relationships and productivity in their occupational role.<sup>16</sup> Moreover, the QLS has been validated in a number of countries including the United States, France, Portugal, Spain, Brazil and India, with good psychometric qualities in all validation studies.<sup>16,20–24</sup> For all of these reasons, in this review, we chose to assess manuscripts which had used the QLS.

The aim of this study is to analyse the scientific evidence produced from the QLS results and its relationship with the symptomatology of patients with schizophrenia.

## Method

### Data sources and searches

The PRISMA criteria were applied for meta-analyses and systematic reviews (Prisma).<sup>b</sup> The EndNote bibliographic computer program was used in this study.

We conducted a study of the literature review using digital database research, Medline/Pubmed, and Scopus, in the last ten years (2007 to 2016). We recognised articles published in international journals which used the QLS. The descriptors "schizophrenia AND QLS" were used. Our search was restricted to articles published in English.

### Quality of Life Scale (QLS)

A Quality of Life Scale (QLS) was developed in 1984 by Heinrichs, Hanlon and Carpenter. Its initial purpose to measure the deficit syndrome in patients with schizophrenia within the last four weeks. It consists of a semi-structured 21-item interview with 7 points for each item. It should be applied by a clinician and takes approximately 45 minutes to be applied. It is divided into four dimensions: Intrapsychic Foundations – IF (which assesses motivation, curiosity, empathy, the ability to feel pleasure and emotional interaction); Interpersonal Relations – IR (which assesses the quality and quantity of social relationships); Instrumental Role Functioning – IRF (which assesses productivity in their occupational role, whether at work, at school or in household chores/parental role) and Common Objects and Activities – COA (which assesses the possession of common objects, such as a watch to see the time and involvement in regular activities which assume active participation in society, such as using public transport). The total score of the scale and each of the domains ranges from 0 to 6. A score between 5 and 6 is considered unaltered, from 2 to 4 reveals considerable loss, and a score between 0 and 1 suggests serious impairment in functioning.

Subsequently, abbreviated versions of the scale which demonstrated good psychometric properties were constructed to facilitate their application in clinical settings.<sup>25–27</sup> In one of the studies, the results showed that an abbreviated version of the 7-item scale predicted a total score of 21 items with high precision, obtaining reliable results.<sup>25</sup> Recently, another study validated these results, using a sample of 1430 participants, for the same 7-item scale. Another study validated a QLS 5-item scale.<sup>27</sup>

In 2016 the QLS was revised using exploratory factor analyses and confirmatory factor analyses to assess the factor structure of the QLS. The sample was comprised of two

<sup>b</sup> PRISMA Transparency reporting of systematic reviews and meta-analyses. Available in PRISMA Transparency reporting of systematic reviews and meta-analyses. Available from: <http://www.prisma-statement.org/> [cited 30.1.17].

groups, a mixed diagnostic sample of multi-episode participants ( $N=247$ ) and a sample of individuals with a first psychotic episode ( $N=337$ ). The results showed the strength of the 3-factor model of the QLS-R in schizophrenia and mixed diagnostic samples.<sup>18</sup>

### Eligible criteria

All of the articles were evaluated according to the following criteria: (1) the study samples include only outpatients with schizophrenia; (2) the aim of the studies was to compare the QLS results with the symptomatology of schizophrenia; (3) studies written in English. The inclusion and exclusion criteria are described in Table 1. Studies that did not meet the above criteria were excluded.

### Data extraction

Pertinent data were extracted by two reviewers independently and divergences were resolved by discussion and new analyses of the article. Whenever necessary, a third reviewer was consulted. The studies were compiled in a summary table for a better understanding of the systematic literature review. This table was compiled under nine items: author, year, sample, country, methodology, instruments, dimensions evaluated, results and aim of the studies review (Table 2).

### Selection process

In the first search, when the descriptors “QLS AND schizophrenia” were used, we found 79 articles published in Medline/PubMed and 91 published in Scopus. A number of the same scientific papers had been published in both databases. Nevertheless, we found 15 different publications in Scopus, so that there were 94 publications to analyse in all.

89 full-text publications were analysed and 77 were excluded: 12 articles were related to patients living in institutions or patients with other pathologies associated with schizophrenia; 56 publications did not compare the QLS results with the symptomatology of schizophrenia (27 publications were concerned with medication or treatment in schizophrenia, 2 publications focused on the abbreviated QLS scale, 1 publication dealt with confirmatory factor analysis of the QLS, 6 articles were about the psychometric characteristics of other scales; and 20 publications had another aim), 5 articles had not been written in English and 4 articles were not primary studies.

In all, 12 studies were included in this review. The study selection process is shown in the following flowchart (Fig. 1).

### Results

Twelve complete articles which met the criteria were analysed and used in this review (Table 2). A total of 1645 patients with schizophrenia (1023 males and 622 females) from four different countries (Brazil, Italy, United States, Japan) were also analysed.

All of the studies used internationally recognised diagnostic criteria for schizophrenia with 10 studies using

the Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR or DSM-IV), 1 article using the International Classification of Diseases (ICD-10) and one study applying the Mini International Neuropsychiatric Interview (MINI) to confirm diagnoses. All of the samples were made up of patients at a stable stage of the disease in outpatient treatment.

Ten articles were stemmed from cross-sectional studies while 2 articles were based on longitudinal studies.

Data collection of all of the studies was carried out in health institutions, such as departments of psychiatry or psychosocial rehabilitation centres and adhered to ethical principles, with permission obtained from ethics committees and from the institutions where the studies were conducted. Participants' informed consent was also obtained in all of the studies. The assessment instruments were applied by experienced researchers.

All of the studies evaluated psychotic symptoms which are characteristic of schizophrenia (negative symptoms and positive symptoms). To evaluate these symptoms, 10 studies used the Positive and Negative Syndrome Scale (PANSS), one study used the Scale for Assessment of Negative Symptoms (SANS) and the Scale for Assessment of Positive Symptoms (SAPS) and a study used the Brief Psychiatric Rating Scale (BPRS).

With respect to negative symptoms, PANSS evaluates the presence and degree of blunted affect, emotional withdrawal, poor rapport, passive/apathetic social withdrawal, difficulty in abstract thinking, lack of spontaneity and flow of conversation and stereotyped thinking. Regarding positive symptoms, it evaluates the presence and degree of delusions, conceptual disorganisation, hallucinatory behavior, excitement, grandiosity, suspiciousness/persecution, and hostility.

Seven studies also evaluated depressive symptomatology. They all used the Calgary Depression Scale for Schizophrenia (CDSS), which has been specially developed to evaluate depressive symptoms in patients with schizophrenia, distinguishing it from psychotic symptoms and side effects of antipsychotics.

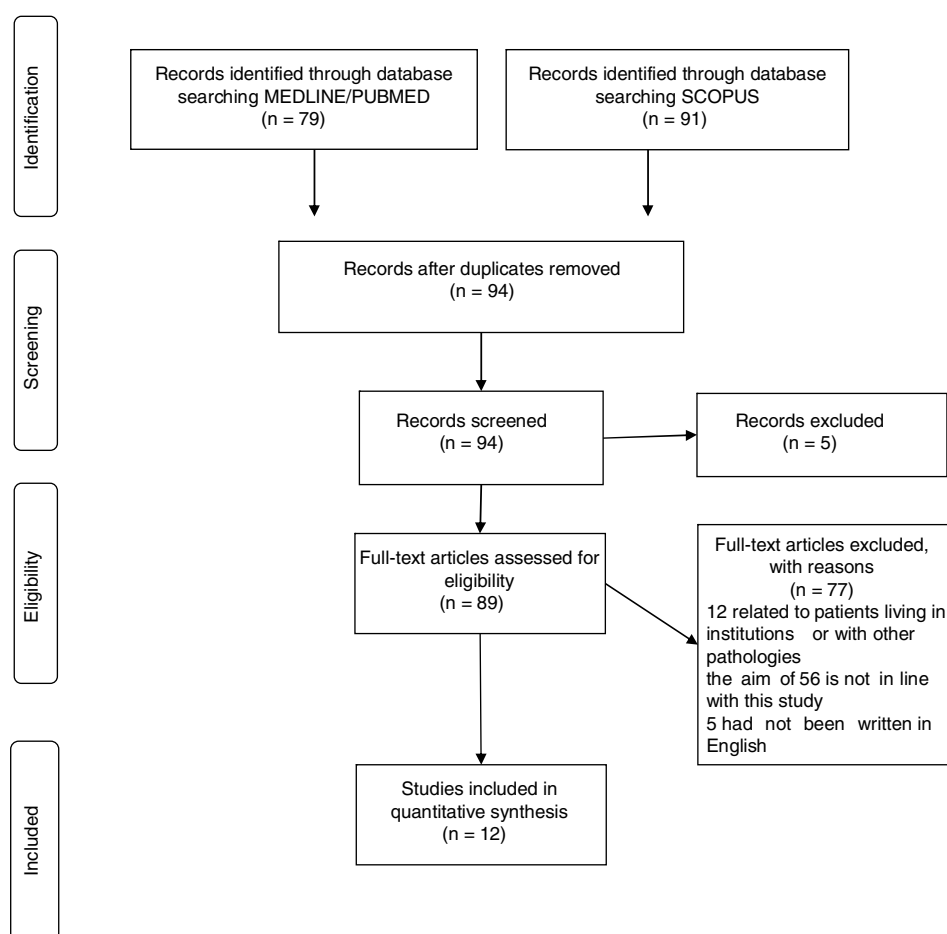
One study evaluated the basic symptoms assessed by the Italian version of the Frankfurt Complaint Questionnaire (FCQ), called FBF, evaluating: loss of control, simple perception, complex perception, language, thought, memory, motility, lack of automatism, anhedonia, anxiety and sensory overstimulation.

Regarding the aims of the studies, 8 had stated that one of their specific aims was to evaluate the relationship between quality of life/functioning assessed through the QLS and the symptomatology. One of these only assessed the symptom disorganisation and 4 specifically assessed the clinical factors, including symptomatology, and quality of life/functioning. Of these studies, four also evaluated cognitive dysfunction; one evaluated insight and coping, one assessed levels of life skills and one self-perceived recovery. Two also studied sociodemographic data.

In one study,<sup>28</sup> the results demonstrated that the best predictors of quality of life are negative symptoms and cognitive deficits. Better QLS results were found in patients with fewer negative symptoms regardless of the results of the Schizophrenia Cognition Rating Scale (SCoRS). Moreover,

**Table 1** Inclusion/exclusion criteria.

Inclusion criteria	Exclusion criteria	Justification of criteria
Studies in with the sample only included outpatients with schizophrenia	The sample of the studies which included patients with other pathologies associated or patients living in institutions	We included only studies that examine outpatients with schizophrenia and excluded studies that analysed patients living in institutions or patients with other pathologies, for example, schizophreniform disorder, delusional disorder or first psychotic episode
The aim of the studies was to compare the results of the QLS with symptomatology of schizophrenia	Publications that did not compare the results of QLS with the symptomatology of schizophrenia	We excluded publications that: compare the results of QLS with medication or other types of treatment; compare the results of the QLS with cognitive impairments; evaluated the psychometric characteristics of the QLS or other scales; compare a patient-rated subjective QoL scale with an observer-rated QoL scale; and other articles that did not compare the results of the QLS with the symptomatology of schizophrenia
Studies written in English Primary studies	Studies not written in English Books chapters, conference abstracts; commentaries; reviews; dissertations.	Only studies written in English were included Studies were restricted to primary studies with empirical literature

**Figure 1** Prisma flowchart.

**Table 2** Summary of information from seventeen relevant articles which met our inclusion criteria in the study of “Quality of Life in Patients with Schizophrenia evaluated with the Quality of Life Scale (QLS)”.

Author/year	Sample	Country	Methodology	Instruments	Dimensions evaluated	Aim	Results
Cruz et al., 2016 <sup>28</sup>	N = 79 outpatients with schizophrenia (MINI criteria)	Brazil	Cross-sectional study	QLS-BR SCoRS PANSS CDSS	Quality of life Cognition Severity of symptoms	To evaluate the correlation between QOL, symptoms and cognition.	The best predictors of quality of life (QOL) were cognitive deficits ( $p < 0.001$ ) and negative symptoms ( $p < 0.001$ ). Regardless, positive symptoms also influence quality of life ( $p = 0.026$ ). A better QOL was found in patients with a low degree of negative symptoms, regardless of SCoRS rating. Between participants with more severe negative symptoms, a worse QOL was found in patients with elevated cognitive impairment.
Rocca et al., 2016 <sup>29</sup>	N = 323 outpatients with schizophrenia (DSM-IV-TR)	Italy	Cross-sectional study	QLS PANSS CGI-S CDSS GAF SUMD	Quality of life Symptoms Levels of functioning	To identify profiles of functioning in patients with schizophrenia empirically; To assess factors associated with the best profile membership.	The results demonstrate that fewer negative symptoms, less severe depressive symptoms, being employed, having a long-term relationship, and treatment with SGAs were associated with good functioning.
Montemagni et al., 2014 <sup>30</sup>	N = 92 outpatients with schizophrenia (DSM-IV-TR)	Italy	Cross-sectional study	QLS CGI-S PANSS CDSS GAF SUMD WCST RSES CISS	Quality of life Global illness severity Negative symptoms Insight Coping	To assess the relative influences of negative symptomatology, insight and coping on QOL.	The results suggest that for patients with higher negative symptoms, insight and coping-social diversion contribute to QOL: higher negative symptoms predict worse intrapsychic foundations (QLS-IF) subscale scores and symptoms and coping-social diversion suggest a positive QLS-IF.
Kukla et al., 2014 <sup>31</sup>	N = 68 outpatients with schizophrenia (DSM-IV-TR)	United States	Cross-sectional study	QLS PANSS RAS	Quality of life Perceptions of recovery Symptomatology	To evaluate the relationship between self-perceived recovery, symptoms, and the social components of quality of life.	The results demonstrate that the participants with more severe levels of positive symptoms and a stronger subjective recovery achieved higher levels in the QLS Intrapsychic Foundations and the QLS instrumental role functioning compared to participants with high positive symptoms but lower levels of recovery.

Table 2 (Continued)

Author/year	Sample	Country	Methodology	Instruments	Dimensions evaluated	Aim	Results
Rocca et al., 2014 <sup>32</sup>	N=92 outpatients with schizophrenia (DSM-IV-TR)	Italy	Cross-sectional study	QLS PSP CDSS CGI-S SANS SAPS	Real-world functioning Negative symptoms (DE – affective flattening and alogia; AA – avolition and anhedonia)	To assess the relationship of specific negative symptoms' components (DE, AA) with separate domains of real world outcomes (the PSP and selected items of the QLS) and recent employment and marriage.	AA was associated with the level of the QLS interpersonal relations and social network, and the personal and social performance measured by the PSP. The AA subdomain was a significant predictor of the social outcome, marriage. The DE subdomain does not appear to have an impact on real-world functional performance.
Sigauco et al., 2014	N=276 outpatients with schizophrenia (DSM-IV-TR)	Italy	Cross-sectional study	QLS CGI-S PANSS Stroop Test TMT CVLT WCST	Quality of life Disorganisation Cognitive dysfunction	To evaluate the relative contributions of disorganisation and cognitive dysfunction to QOL.	Disorganisation had a negative relationship with QOL, with the role-functioning domain and the intrapsychic functioning domain. Verbal memory was a partial moderator of the association between disorganisation and QOL.
Silva et al., 2011 <sup>34</sup>	N=79 outpatients with schizophrenia (ICD-10)	Brazil	Cross-sectional study	QLS-BR PANSS	Quality of life Social-demographic factors Clinical factors	To assess QOL and the sociodemographic and associated clinical factors in patients with schizophrenia.	Occupational performance was the most frequently affected area. Marital status, race, occupation, cohabitation, homelessness, having children, previous psychiatric hospitalisation and negative symptoms were the variables that indicated a significant association with severe impairment of QOL.
Ueoka et al., 2011 <sup>35</sup>	N=61 outpatients with schizophrenia (DSM-IV)	Japan	Longitudinal study	QLS BACS PANSS CDSS DIEPSS	Quality of life Cognitive function	To analyse the association between clinical factors, especially cognitive dysfunction, and QOL in schizophrenia.	The results found that negative and depressive symptoms are important factors for QOL in patients with schizophrenia. Moreover, there was a significant and positive correlation with the QLS and the BACS composite score, the attention and speed of information processing score and the verbal memory score. Moreover, cognitive performance provides a determinant of QOL.



Table 2 (Continued)

Author/year	Sample	Country	Methodology	Instruments	Dimensions evaluated	Aim	Results
Rocca et al., 2010 <sup>36</sup>	N= 118 outpatients with schizophrenia (DSM-IV-TR)	Italy	Cross-sectional study	QLS GAF PANSS FBF CDSS	Quality of life Global functioning Basic symptoms (BS)	To analyse the relationship of BS with objective symptoms, functioning and QOL in a population of outpatients with schizophrenia.	The results demonstrate a significant correlation with QOL and functional outcome. BS showed a significant relationship with the depressive dimension ( $p < 0.001$ ) and global functioning ( $p < 0.05$ ) and some aspects of QOL, QLS-IF ( $p < 0.05$ ).
Perlick et al., 2008 <sup>37</sup>	N= 309 outpatients with schizophrenia (DSM-IV)	United States	Longitudinal study	QLS PANSS WCST TMT	Functional status Neurocognitive factors	To analyse the relationship between positive and negative symptoms, as well as of neurocognition with functional status in patients with schizophrenia.	The PANSS explained 16% additional variance in QLS total score after accounting for demographics and visit number. The neurocognitive factors explained only 4% additional variance beyond the effect of the symptoms. These results suggest that symptoms may pose an equal or greater impediment to functional capacity independent of neurocognition in patients with schizophrenia.
Aki et al., 2008 <sup>38</sup>	N= 64 outpatients with schizophrenia (DSM-IV)	Japan	Cross-sectional study	QLS SQLS LSP BPRS CDSS	Subjective quality of life Objective quality of life Life skills Symptoms	To evaluate the associations between subjective and objective QOL, levels of life skills and clinical determinants in patients with schizophrenia.	The results showed that the patients' QOL could be predicted by their life skills measured by a family member. The results suggest that negative symptoms predict QOL evaluated by the QLS. However, positive symptoms did not predict QOL. The results suggested that active treatment for depressive and negative symptoms might be recommended to improve schizophrenic QOL and life skills.
Yamauchi et al., 2008 <sup>39</sup>	N= 84 schizophrenia outpatients (DSM-IV)	Japan	Cross-sectional study	QLS SQLS PANSS DIEPSS	Subjective quality of life Objective quality of life Clinical variables Extrapyramidal symptoms	To compare the association between clinical variables and subjective and objective QOL in patients with schizophrenia.	Cognitive dysfunction had a better effect on objective QOL than subjective QOL. Negative symptoms were negatively correlated with objective QOL (evaluated by QLS).

BACS (Brief Assessment of Cognition in Schizophrenia); BPRS (Brief Psychiatric Rating Scale); CDSS (Calgary Depression Scale for Schizophrenia); CGI-S (Clinical Global Impression-Severity Scale); CISS (Coping Inventory for Stressful situations); CVLT (California Verbal Learning Test); DIEPSS (Drug-Induced Extrapyramidal Symptoms Scale); FBF (Frankfurter-Befindlichkeits-Skala); GAF (Global Assessment of Functioning Scale); LSP (Life Skills Profile); PANSS (Positive and Negative Syndrome Scale); PSP (Personal and Social Performance Scale); RAS (Recovery Assessment Scale); RSES (Rosenberg Self-Esteem Scale); SANS (Scale for Assessment of Negative Symptoms); SAPS (Scale for Assessment of Positive Symptoms); SCoRS (The Schizophrenia Cognition Rating Scale); SUMD (Scale for the Assessment of Unawareness of Mental Disorder); TMT (Trail Making Test); WCST (Wisconsin Card Sorting Test).

among schizophrenics with more severe negative symptoms, QLS scores were lower in those with high cognitive deficits. Depressive symptoms did not influence the QLS results.

One study<sup>29</sup> grouped the participants with schizophrenia by performance levels assessed by QLS, divided into three groups, "Good QOL", "moderate QOL" and "poor QOL" and related these three groups with sociodemographic and clinical factors, including negative/positive symptoms and depressive symptoms. The authors concluded that the good QOL group had lower severity levels of negative and depressive symptoms.

In another study,<sup>30</sup> which related negative symptoms, coping and insight, insight and coping-social diversion were found to contribute to improving the quality of life in patients with high negative symptoms.

In another study,<sup>31</sup> the results demonstrated that for patients with considerable positive symptoms, higher levels of subjective recovery were related to better instrumental role functioning and intrapsychic foundational abilities evaluated by the QLS.

One of the studies<sup>32</sup> evaluated specific negative symptoms (DE – affective flattening and alogia; AA – avolition and anhedonia) and related them to three QLS domains (excluding the IF domain which evaluates negative symptoms) in order to evaluate real world functioning. AA was found to be the most strongly associated with the level of the QLS interpersonal relations ( $p < 0.001$ ). The DE subdomain did not appear to have an impact on real-world functional performance evaluated by the QLS.

One study<sup>33</sup> found that there was a negative relationship between disorganisation and QOL in the role functioning domain and the intrapsychic functioning domain.

One study,<sup>34</sup> which evaluated the relationship between QOL and sociodemographic and clinical factors, obtained statistically significant results between QOL and negative symptoms, finding that negative symptoms influenced the QLS results. Positive symptoms did not produce significant results.

Another study found that negative and depressive symptoms are important factors to QOL, obtaining negative and significant correlations between the QLS and PANSS and CDSS values.<sup>35</sup>

The study<sup>36</sup> which evaluated the basic symptoms through the FBF demonstrated a significant correlation between them and the intrapsychic functioning domain.

In one study<sup>37</sup> that related negative and positive symptoms and neurocognitive functioning to the functional level of schizophrenics, PANSS was found to explain 16% of the variance in the total QLS score. Neurocognitive factors only explain 4%, such that it was found that symptoms impair functional level as much or more than neurocognitive deficits.

In the study<sup>38</sup> which used BPRS, significant results were obtained between total QLS and BPRS for negative symptoms ( $R^2 = 0.329$ ;  $\beta = -0.573$ ;  $p < 0.001$ ).

In another study,<sup>39</sup> negative symptoms were negatively associated with QOL ( $\rho = -0.535$ ;  $p < 0.001$ ). There was no significant correlation between QOL and positive symptoms.

## Discussion

The quality of life and level of functioning are considered important results in the recovery of patients with schizophrenia, with particular attention being paid to these areas in recent years. Some studies have demonstrated the association of some clinical and sociodemographic factors with quality of life and level of functioning. However, many of the scales used are not specific to schizophrenia and, in addition, the application of different assessment tools in the various studies may influence the scientific evidence. For this reason, this review was carried out, which evaluated only studies that used the QLS as an instrument to assess the quality of life/functioning, comparing the results with the symptoms of patients with schizophrenia.

Analysis of the results showed that most of the studies found a negative correlation between quality of life/functioning and the negative symptoms of schizophrenia. Given that negative symptoms interfere in social relationships and in leisure activities due to their characteristics, one would expect them to interfere with quality of life or functional level. One of the studies went further and evaluated specific negative symptoms, classifying them as DE (affective flattening and alogia) and AA (avolition and anhedonia) and comparing them with three domains of the QLS, reaching the conclusion that avolition and anhedonia strongly influence the interpersonal relations domains of the QLS, whereas affective flattening and alogia did not appear to have a large impact on QLS results.<sup>32</sup> Given that avolition is concerned with a lack of will and anhedonia with a lack of pleasure in activities, they are understood to affect interpersonal relationships, as they encourage the patient to stay at home, leading to isolation. One study also concluded that negative symptoms influence the quality of life regardless of cognitive deficits.<sup>28</sup>

With regard to positive symptoms in schizophrenia, in one study<sup>29</sup> disorganisation had a negative relationship with quality of life in two domains: the role functioning and the intrapsychic functioning. In another study,<sup>37</sup> positive symptoms negatively influence the QLS total score and all of the subscales. However, in another study,<sup>36</sup> positive symptoms were associated only with the psychosocial functioning domain of the QLS. We found that, regarding the influence of positive symptoms on QLS, the results are not similar, so that we cannot consider that positive symptoms influence the quality of life.

As far as depressive symptoms are concerned, two studies showed that they negatively influence quality of life/functioning in patients with schizophrenia.<sup>29,35</sup> However, the remaining studies that studied depressive symptoms found no correlation between these and the QLS.<sup>28,30,36,38</sup>

Finally, the study that evaluated the basic symptoms demonstrated a significant correlation between these and the intrapsychic functioning domain of the QLS.<sup>36</sup>

In addition to these results, one study<sup>30</sup> found that in a group of patients with severe negative symptoms, those with better insight and coping strategies had a better quality of life. Another study<sup>31</sup> found that among patients with more positive symptoms, those with better levels of



subjective recovery performed better on the QLS instrumental role functioning and intrapsychic foundational domains.

These results suggest that symptomatology influences the quality of life, especially negative symptoms. For this reason, we consider it very important that interventions for patients with schizophrenia do not just focus on decreasing positive symptoms, but also on reducing negative symptoms.

### Summary of methodological limitations

The methodology for inclusion and exclusion criteria of the systematic reviews always restricted the results obtained and can leave out several important studies. In this study, one inclusion criterion was studied that used the QLS. This fact excluded numerous studies that used other scales. However, we consider it very important to conduct a study that only used one scale to measure the same construct because the existing scales are very different and comparing the results would not be very reliable. Thus, with these criteria, we believe our study allowed us to make a more accurate and judicious comparison of the variables identified.

There was one limitation we found in the articles analysed: small samples.<sup>28,31,34,35,38</sup>

### Implications for practice

Schizophrenia is a severe mental health disorder with serious challenges to quality of life/functioning. Thus, this disease is surely a considerable problem in health sciences. Moreover, the mechanisms of this mental health condition are still far from being elucidated and more studies should be conducted to better understand this disease.

Nowadays, there is no systematic literature review that provides a meta-analysis into the quality of life/functioning in patients with schizophrenia evaluated by the QLS and the association with symptomatology. The aim of this study was to ascertain what has been done and to accentuate the importance of carrying out future research.

This research suggests new and more longitudinal studies are necessary and that it is important to extend these studies to other countries.

### Conclusion

This review has identified common concerns reported in different studies.

The studies analysed, therefore, suggest that the quality of life/functioning in patients with schizophrenia can be influenced by symptomatology (negative, positive and depressive symptoms). As regards negative symptoms the studies appear to be consistent. Nevertheless, in with regards to positive and depressive symptoms, the results are not congruent or consistent.

We can thus conclude that the results of the studies analysed demonstrate that the negative symptoms influence the quality of life of patients with schizophrenia. However, several other studies do not offer conclusive evidence as to whether it is possible to obtain a comprehensive understanding regarding other symptoms influencing the quality of life of patients with schizophrenia, owing to poor

samples, lack of generalisability and the heterogeneity of these investigations.

This literature review indicated that more research is needed to find better evidence as to the symptoms that influence the quality of life in patients with schizophrenia.

It is also suggested that a systematic review of the literature should be performed to evaluate the strategies used in psychosocial rehabilitation and its effectiveness in reducing the negative symptoms of patients with schizophrenia consequently improving the quality of life/functioning.

### Funding

There was no funding for this work.

### Conflicts of interest

The authors have no conflict of interest to declare.

### References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5). 5th ed. Washington, DC: American Psychiatric Association; 2013.
2. Ochoa S, Usall J, Villalta-Gil V, Vilaplana M, Márquez M, Valdelomar M, et al. Influence of age at onset on social functioning in outpatients with schizophrenia. *Eur J Psychiatry*. 2006;20:157–63.
3. Couture SM, Granholm EL, Fish SC. A path model investigation of neurocognition, theory of mind, social competence, negative symptoms and real-world functioning in schizophrenia. *Schizophrenia Res*. 2011;125:152–60.
4. Addington J, Addington D. Social and cognitive functioning in psychosis. *Schizophrenia Res*. 2008;99:176–81.
5. Alessandrini M, Lançon C, Fond G, Faget-Agius C, Richieri R, Faugere M, et al. A structural equation modelling approach to explore the determinants of quality of life in schizophrenia. *Schizophrenia Res*. 2016;171:27–34.
6. Chou CY, Ma MC, Yang TT. Determinants of subjective health-related quality of life (HRQoL) for patients with schizophrenia. *Schizophrenia Res*. 2014;154:83–8.
7. Meesters PD, Comijs HC, de Haan L, Smit JH, Eikelenboom P, Beekman ATF, et al. Subjective quality of life and its determinants in a catchment area based population of elderly schizophrenia patients. *Schizophrenia Res*. 2013;147:275–80.
8. Brissos S, Balanzá-Martínez V, Dias VV, Carita AI, Figueira ML. Is personal and social functioning associated with subjective quality of life in schizophrenia patients living in the community? *Eur Arch Psychiatry Clin Neurosci*. 2011;261:509–17.
9. Cesari L, Bandeira M. Avaliação da qualidade de vida e percepção de mudança em pacientes com esquizofrenia. *J Bras Psiquiatria*. 2010;59:293–301.
10. Aki H, Tomotake M, Kaneda Y, Iga JI, Kinouchi S, Shibuya-Tayoshi S, et al. Subjective and objective quality of life, levels of life skills, and their clinical determinants in outpatients with schizophrenia. *Psychiatry Res*. 2008;158:19–25.
11. Gómez-de-Regil L. Curso de la enfermedad y calidad de vida en pacientes mexicanos con psicosis. *Rev Psiquiatria Salud Mental*. 2015;8:218–23.
12. Górna K, Jaracz K, Jaracz J, Kiejda J, Grabowska-Fudala B, Rybakowski J. Social functioning and quality of life in schizophrenia patients – relationship with symptomatic remission and duration of illness. *Psychiatria Polska*. 2013;48:277–88.

13. Song YY, Kim KR, Park JY, Lee SY, Kang JI, Lee E, et al. Associated factors of quality of life in first-episode schizophrenia patients. *Psychiatry Investig.* 2011;8:201–6.
14. Heider D, Angermeyer MC, Winkler I, Schomerus G, Bebbington PE, Brugha T, et al. A prospective study of Quality of life in schizophrenia in three European countries. *Schizophrenia Res.* 2007;93:194–202.
15. Cardoso CS, Caiaffa WT, Bandeira M, Siqueira AL, Abreu MN, Fonseca JO. Qualidade de vida e dimensão ocupacional na esquizofrenia: uma comparação por sexo Quality of life and occupational domain in schizophrenia: a gender comparison. *Cadernos Saúde Pública.* 2006;22:1303–14.
16. Heinrichs DW, Hanlon TE, Carpenter WT. The quality of life scale: an instrument for rating the schizophrenic deficit syndrome. *Schizophrenia Bull.* 1984;10:388–98.
17. Karow A, Wittmann L, Schöttle D, Schäfer I, Lambert M. The assessment of quality of life in clinical practice in patients with schizophrenia. *Dialog Clin Neurosci.* 2014;16:185–95.
18. Mueser KT, Kim M, Addington J, McGurk SR, Pratt SI, Addington DE. Confirmatory factor analysis of the quality of life scale and new proposed factor structure for the quality of life scale-revised. *Schizophrenia Res.* 2017;181:117–23, <http://dx.doi.org/10.1016/j.schres.2016.10.018>.
19. Fervaha G, Foussias G, Siddiqui I, Agid O, Remington G. Abbreviated quality of life scales for schizophrenia: comparison and utility of two brief community functioning measures. *Schizophrenia Res.* 2014;154:89–92.
20. Vallerand R. Vers une methodologie de validation transculturelle de questionnaires psychologiques. *Can Psychol.* 1989;30:662–80.
21. Guedes de Pinho L, Pereira A, Chaves C. Portuguese adaptation of the quality of life scale for patients with schizophrenia. *Rev Iberoam Diag Eval Psicológ.* 2017 [in press].
22. Rodríguez A, Soler RM, Rodríguez A, Esparcia AJJ, Miarons R. Estudio factorial y adaptación de la escala de calidad de vida en la esquizofrenia (QLS). *Rev Psicolog Gen Apl: Rev Fed Española Asoc Psicolog.* 1995;48:353–64.
23. Cardoso CS, Bandeira M, Caiaffa WT, Fonseca JOP. Escala de qualidade de vida para pacientes com esquizofrenia QLSBR: adaptação transcultural para o Brasil. *J Bras Psiquiatria.* 2002;51:31–8.
24. Gupta N, Mattoo SK, Basu D, Lobana A. Psychometric properties of quality of life (QLS) scale: a brief report. *Indian J Psychiatry.* 2000;42:415.
25. Bilker WB, Brensinger C, Kurtz MM, Kohler C, Gur RC, Siegel SJ, et al. Development of an abbreviated schizophrenia quality of life scale using a new method. *Neuropsychopharmacology.* 2003;28:773–7, <http://dx.doi.org/10.1038/sj.npp.1300093>.
26. Fervaha G, Remington G. Validation of an abbreviated quality of life scale for schizophrenia. *Eur Neuropsychopharmacol.* 2013;23:1072–7.
27. Ritsner M, Kurs R, Ratner Y, Gibel A. Condensed version of the Quality of Life Scale for schizophrenia for use in outcome studies. *Psychiatry Res.* 2005;135:65–75, <http://dx.doi.org/10.1016/j.psychres.2005.01.007>.
28. Cruz BF, Resende CBD, Carvalhaes CF, Cardoso CS, Teixeira AL, Keefe RS, et al. Interview-based assessment of cognition is a strong predictor of quality of life in patients with schizophrenia and severe negative symptoms. *Rev Bras Psiqu.* 2016;38:216–21.
29. Rocca P, Montemagni C, Mingrone C, Crivelli B, Sigaucho M, Bogetto F. A cluster-analytical approach toward real-world outcome in outpatients with stable schizophrenia. *Eur Psychiatry.* 2016;32:48–54.
30. Montemagni C, Castagna F, Crivelli B, De Marzi G, Frieri T, Macri A, et al. Relative contributions of negative symptoms, insight, and coping strategies to quality of life in stable schizophrenia. *Psychiatry Res.* 2014;220:102–11.
31. Kukla M, Lysaker PH, Roe D. Strong subjective recovery as a protective factor against the effects of positive symptoms on quality of life outcomes in schizophrenia. *Comprhen Psychiatry.* 2014;55:1363–8.
32. Rocca P, Montemagni C, Zappia S, Piterà R, Sigaucho M, Bogetto F. Negative symptoms and everyday functioning in schizophrenia: a cross-sectional study in a real world-setting. *Psychiatry Res.* 2014;218:284–9.
33. Sigaucho M, Crivelli B, Castagna F, Giugiaro M, Mingrone C, Montemagni C, et al. Quality of life in stable schizophrenia: the relative contributions of disorganization and cognitive dysfunction. *Schizophrenia Res.* 2014;153:196–203.
34. Silva TFCD, Mason V, Abelha L, Lovisi GM, Cavalcanti MT. Quality of life assessment of patients with schizophrenic spectrum disorders from Psychosocial Care Centers. *J Bras Psiqu.* 2011;60:91–8.
35. Ueoka Y, Tomotake M, Tanaka T, Kaneda Y, Taniguchi K, Nakataki M, et al. Quality of life and cognitive dysfunction in people with schizophrenia. *Prog Neuro-Psychopharmacol Biol Psychiatry.* 2011;35:53–9.
36. Rocca P, Pulvirenti L, Montemagni C, Rasetti R, Rocca G, Bogetto F. Basic symptoms in stable schizophrenia: relations with functioning and quality of life. *Clin Neuropsychiatry.* 2010;7:100–10.
37. Perlick DA, Rosenheck RA, Kaczynski R, Bingham S, Collins J. Association of symptomatology and cognitive deficits to functional capacity in schizophrenia. *Schizophrenia Res.* 2008;99:192–9.
38. Aki H, Tomotake M, Kaneda Y, Iga JI, Kinouchi S, Shibuya-Tayoshi, et al. Subjective and objective quality of life, levels of life skills, and their clinical determinants in outpatients with schizophrenia. *Psychiatry Res.* 2008;158:19–25.
39. Yamauchi K, Aki H, Tomotake M, Iga JI, Numata S, Motoki I, et al. Predictors of subjective and objective quality of life in outpatients with schizophrenia. *Psychiatry Clin Neurosci.* 2008;62:404–41.