ARTICLE IN PRESS
SCHRES-07839; No of Pages 8

Schizophrenia Research xxx (2018) xxx–xxx

Contents lists available at ScienceDirect

Schizophrenia Research

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

The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental Health Surveys

Jordi Alonso [a,b,c], Sukanta Saha [d,e], Carmen C.W. Lim [d,e], Sergio Aguilar-Gaxiola [f], Ali Al-Hamzawi [g], Corina Benjet [h], Evelyn J. Bromet [i], Louisa Degenhardt [j], Giovanni de Girolamo [k], Oluyomi Esan [l], Silvia Florescu [m], Oye Gureje [n], Josep M. Haro [o], Chiyi Hu [p], Elie G. Karam [q,r,s], Georges Karam [r,s,t], Viviane Kovess-Masfety [u], Jean-Pierre Lepine [v], Sing Lee [w], Zeina Mneimneh [x], Fernando Navarro-Mateu [y], Jose Posada-Villa [z], Nancy A. Sampson [aa], Kate M. Scott [ab], Juan Carlos Stagnaro [ac], Margreet ten Have [ad], Maria Carmen Viana [ae], Ronald C. Kessler [aa], John J. McGrath [d,e,af,*], on behalf of the WHO World Mental Health Survey Collaborators [1]

[a] Health Services Research Unit, IMIM-Hospital del Mar Medical Research Institute, Barcelona, Spain
[b] Pompeu Fabra University (UPF), Barcelona, Spain
[c] CIBER en Epidemiología y Salud Pública (CIBERESP), Barcelona, Spain
[d] Queensland Centre for Mental Health Research, University of Queensland, St. Lucia, Queensland, Australia
[e] Queensland Brain Institute, University of Queensland, St. Lucia, Queensland, Australia
[f] Center for Reducing Health Disparities, UC Davis Health System, Sacramento, CA, USA
[g] College of Medicine, Al-Qadisiya University, Diwaniya Governorate, Iraq
[h] Department of Epidemiologic and Psychosocial Research, National Institute of Psychiatry Ramón de la Fuente Muniz, Mexico City, Mexico
[i] Department of Psychiatry, Stony Brook University School of Medicine, Stony Brook, NY, USA
[j] National Drug and Alcohol Research Centre, University of New South Wales, Sydney, Australia
[k] Unit of Epidemiological and Evaluation Psychiatry, Istituti di Ricovero e Cura a Carattere Scientifico (IRCCS)-St. John of God Clinical Research Centre, Via Pilastroni 4, Brescia, Italy
[l] Department of Psychiatry, University College Hospital, Ibadan, Nigeria
[m] National School of Public Health, Management and Professional Development, Bucharest, Romania
[n] Department of Psychiatry, College of Medicine, University of Ibadan and University College Hospital, Ibadan, Nigeria
[o] Parc Sanitari Sant Joan de Déu, CIBERSAM, Universitat de Barcelona, Sant Boi de Llobregat, Barcelona, Spain
[p] Shenzhen Institute of Mental Health & Shenzhen Kangning Hospital, Shenzhen, China
[q] Department of Psychiatry and Clinical Psychology, Faculty of Medicine, Balamand University, Beirut, Lebanon
[r] Department of Psychiatry and Clinical Psychology, St George Hospital University Medical Center, Beirut, Lebanon
[s] Institute for Development Research Advocacy and Applied Care (IDRAAC), Beirut, Lebanon
[t] Balamand University, Faculty of Medicine, Beirut, Lebanon
[u] Ecole des Hautes Etudes en Santé Publique (EHESP), EA 4057 Paris Descartes University,Paris, France
[v] Hôpital Lariboisière- Fernand Widal, Assistance Publique Hôpitaux de Paris; Universités Paris Descartes-Paris Diderot; INSERM UMR-S 1144, Paris, France
[w] Department of Psychiatry, Chinese University of Hong Kong, Tai Po, Hong Kong
[x] Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, Michigan, USA
[y] UDIF-SM, Subdirección General de Planificación, Innovación y Cronicidad, Servicio Murciano de Salud, IMIB-Arrixaca, CIBERESP-Murcia, Murcia, Spain
[z] Colegio Mayor de Cundinamarca University, Faculty of Social Sciences, Bogota, Colombia
[aa] Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts, USA
[ab] Department of Psychological Medicine, University of Otago, Dunedin, Otago, New Zealand
[ac] Departamento de Psiquiatría y Salud Mental, Facultad de Medicina, Universidad de Buenos Aires, Argentina
[ad] Trimbos-Instituut, Netherlands Institute of Mental Health and Addiction, Utrecht, Netherlands
[ae] Department of Social Medicine, Postgraduate Program in Public Health, Federal University of Espírito Santo, Vitoria, Brazil
[af] National Centre for Register-based Research, Aarhus BSS, Aarhus University, Aarhus, Denmark.

ARTICLE INFO

Article history:
Received 16 January 2018
Received in revised form 27 April 2018
Accepted 29 April 2018

ABSTRACT

Psychotic experiences (PEs) are associated with a range of mental and physical disorders, and disability, but little is known about the association between PEs and aspects of health-related quality of life (HRQoL). We aimed to investigate the association between PEs and five HRQoL indicators with various adjustments. Using data from

---

[*] Corresponding author at: Queensland Brain Institute, The University of Queensland, St Lucia, Queensland 4076, Australia.
E-mail address: j.mcgrath@uq.edu.au (J.J. McGrath).

[1] The WHO World Mental Health Survey Collaborators are listed at the end of this article.

https://doi.org/10.1016/j.schres.2018.04.044
0920-9964/© 2018 Published by Elsevier B.V.

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

Keywords:
Psychotic experiences
Health-related quality of life
Perceived health
Stigma
Social network burden
World Mental Health surveys

the WHO World Mental Health surveys ($n = 33{,}370$ adult respondents from 19 countries), we assessed for PEs and five HRQoL indicators (self-rated physical or mental health, perceived level of stigma (embarrassment and discrimination), and social network burden). Logistic regression models that adjusted for socio-demographic characteristics, 21 DSM-IV mental disorders, and 14 general medical conditions were used to investigate the associations between the variables of interest. We also investigated dose-response relationships between PE-related metrics (number of types and frequency of episodes) and the HRQoL indicators. Those with a history of PEs had increased odds of poor perceived mental (OR = 1.5, 95% CI = 1.2–1.9) and physical health (OR = 1.3, 95% CI = 1.0–1.7) after adjustment for the presence of any mental or general medical conditions. Higher levels of perceived stigma and social network burden were also associated with PEs in the adjusted models. Dose-response associations between PE type and frequency metrics and subjective physical and mental health were non-significant, except those with more PE types had increased odds of reporting higher discrimination (OR = 2.2, 95% CI = 1.3–3.5). Our findings provide novel insights into how those with PEs perceive their health status.

1. Introduction

Population based studies have found that psychotic experiences (PEs; hallucinations and delusions) are common in the general population (Linscott and van Os, 2013; McGrath et al., 2015), are associated with a range of mental (DeVylder et al., 2014; McGrath et al., 2016a) and physical disorders (Moreno et al., 2013; Oh and DeVylder, 2015; Saha et al., 2011a), and are associated with increased disability on cognitive, social, and role impairment domains, net of other mental disorders and general medical conditions (Navarro-Mateu et al., 2017; Oh et al., 2017). As part of a wider program of research exploring the epidemiology of PEs, we had the opportunity to examine the associations of PEs with three broad domains of Health-Related Quality of Life (HRQoL): (a) perceived health, (b) stigma and (c) social network burden.

The first aspect of HRQoL, self-rated health, has been studied extensively in relation to mortality and morbidity (DeSalvo et al., 2005; Mavaddat et al., 2014), disability (Alonso et al., 2013; Carlson et al., 2013; Machacova et al., 2011), as well as mental health symptoms severity (Ahmad et al., 2014). Single-item measures of self-rated health status provide important patient-oriented outcomes (for a scoping review, see (Ahmad et al., 2014)). This health status has also been used to compare the impact of different health conditions including mental and physical disorders (Alonso et al., 2013). In recent years, there has been increased interest in its association with health service utilization and satisfaction (Ahmad et al., 2014). Several studies have also shown that PEs are linked with impaired: (a) mental health (Fisher et al., 2013; Kaymaz et al., 2012; Kelleher et al., 2012), and (b) physical health (Oh and DeVylder, 2015; Saha et al., 2011a) as well as psychological or mental distress (Kelleher et al., 2015; Saha et al., 2011d). Given this background, we hypothesized that those with PEs would also perceive their physical and mental health more negatively, and tested whether these relationships persist after adjusting for comorbid mental disorders and general medical conditions. We are not aware of any studies that have previously examined these research questions.

Stigma, the second HRQoL indicator we examined, is associated with social isolation among individuals with mental disorders (Newlin et al., 2015). Stigma stems from real or perceived prejudice and discrimination from the general population towards people with mental illness or other disabilities (Corrigan et al., 2012; Reavley and Jorm, 2011), is commonly experienced by individuals with psychosis (Henderson et al., 2014; Patten et al., 2016; Semrau et al., 2015; Thornicroft et al., 2009), and is a barrier to help seeking and effective heath care (Wahl, 2012; World Health Organization, 2001). Two key components of stigma are embarrassment and perceived discrimination by others (Van Brakel, 2006). A large body of research has explored if perceived stigma is a risk factor for the subsequent onset of psychotic disorders (the "social defeat" hypothesis) (Selten and Cantor-Graae, 2005; Selten et al., 2013). A Dutch community-based study found a relationship between perceived discrimination (e.g. related to skin colour or ethnicity; gender; age; appearance; disability; or sexual orientation) and an increased odds of subsequently developing incident delusional ideation (a type of PE)(Janssen et al., 2003). The association between perceived stigma and PEs has also been reported from other countries. A US community-based study found an association between perceived discrimination (across a range of domains) and increased odds of lifetime PEs (Oh et al., 2014). A study based on a non-clinical Taiwanese sample ($n = 524$) also found an association between perceived stigma and the lifetime prevalence of PEs (Lien et al., 2015). Based on existing literature, we hypothesized that PEs would be associated with both aspects of stigma in our cross-national study.

The third HRQoL indicator that we examined relates to how the health-related difficulties experienced by the respondent interfered with the life and activities of family and friends (e.g., social network burden). Studies show that stigma in mental health is associated with a perceived sense of burden to close members of the social network (Chien et al., 2014). Little is known about the effect of PEs on perceived social network burden, and whether the link is independent of mental disorders and general medical conditions.

In addition to examining the associations of PEs with the above HRQoL indicators, we further examined potential dose-response relationships of the number and frequency of PEs with these HRQoL indicators. The analysis was based on a large sample of adults drawn from a cross-national population-based study—the WHO World Mental Health (WMH) surveys.

2. Methods

The WMH surveys are a coordinated set of community surveys administered to probability samples of the non-institutionalized population in countries throughout the world (https://www.hcp.med.harvard.edu/wmh/) (Kessler and Üstün, 2004). We examined the 19 WMH surveys that included both the CIDI Psychosis Module and perceived health outcomes described below. The 19 countries are distributed across North and South America (Argentina, Brazil- *São Paulo*, Colombia, Mexico, Peru, and USA); Africa (Nigeria); the Middle East (Iraq, Lebanon); Asia (Shenzhen in the People's Republic of China); the South Pacific (New Zealand), and Europe (Belgium, France, Germany, Italy, the Netherlands, Portugal, Romania, Spain). Most of the WMH surveys were based on multi-stage, clustered area probability household sampling designs except Belgium, Germany, and Italy which used municipal resident registries to select respondents (Supplementary Table S1). The weighted average response rate across all 19 countries was 72.3%.

In order to focus on the correlates of PEs in those without psychotic disorders, and in order to harmonize our analyses with previous studies of PEs (McGrath et al., 2015; McGrath et al., 2016a; McGrath et al., 2016b; Saha et al., 2011b; Saha et al., 2011c), we made the a priori

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

decision to exclude individuals who had PEs but who also screened positive for possible schizophrenia/psychosis, and manic-depression/mania (i.e. respondents: (a) who reported *(1) schizophrenia/psychosis* or *(2) manic-depression/mania* in response to the question "*What did the doctor say was causing (this/these) experiences?*"; and (b) who ever took any antipsychotic medications for these symptoms). This resulted in the exclusion of 91 respondents (0.4% of all respondents), leaving 33,370 respondents for this study.

2.1. Procedures

All surveys were conducted in the homes of respondents by trained lay interviewers. Informed consent was obtained before beginning the interview in all countries. Procedures for obtaining informed consent and data protection (ethical approvals) were reviewed and approved by the institutional review boards of the collaborating organizations in each country (Kessler and Ustun, 2008). Standardised interviewer training and quality control procedures were used consistently in the surveys. Full details of these procedures are described elsewhere (Kessler et al., 2006; Kessler and Üstün, 2008).

All WMH interviews had two parts. Part I, administered to all respondents, assessed core mental disorders, indicators related to demographic characteristics and perceived health status. Part 2, which included additional mental disorders, PEs, and general medical conditions, was administered to respondents who met lifetime criteria for a Part I disorder and a random proportion of the remaining sample of those without any Part 1 disorders. Part 2 individuals were weighted by the inverse of their probability of selection to restore representativeness. Additional weights were used to adjust for differential probabilities of selection within households, nonresponse, and to match the samples to population socio-demographic distributions.

2.2. Data collection and data items

The instrument used in the WMH surveys was the WHO Composite International Diagnostic Interview (CIDI) (Kessler and Üstün, 2008), a validated, fully-structured diagnostic interview (https://www.hcp.med.harvard.edu/wmhcidi/download-the-who-wmh-cidi-instruments/) designed to assess the prevalence and correlates of a wide range of mental disorders according to the definitions and criteria of both the DSM-IV and ICD-10 diagnostic systems. WHO translation, back-translation, and harmonisation protocols were used to adapt the CIDI for use in each participating country.

2.2.1. Psychotic experiences (PEs)

The CIDI Psychosis Module included questions about 6 PE types – 2 related to hallucinatory experiences and 4 related to delusional experiences (Supplementary Table S2a, S2b). Respondents were asked if they ever experienced each PE (e.g., "*Have you ever seen something that wasn't there that other people could not see?*"; "*Have you ever heard any voices that other people said did not exist?*" etc.). Only PEs occurring when the person was '*not dreaming, not half-asleep, or not under the influence of alcohol or drugs*' were included. Respondents who reported PEs were then asked about frequency/occurrences of the PEs in their lifetime. In this paper, we present two key PE-related metrics: (a) number of PE types (henceforth referred to as *PE type metric*); and (b) frequency of occurrence of PE episodes. We derived frequency per year by dividing the number of PE episodes by the time since onset of the PEs (age at interview minus age of onset, henceforth referred to as *annualized frequency metric*) (McGrath et al., 2016b).

2.2.2. HRQoL indicators

2.2.2.1. Perceived health. Discrete probes for perceived mental health and perceived physical health were available from nine surveys ($n = 14{,}471$) (*How would you rate your overall physical health? How would you rate your overall mental health?*) while two surveys did not ask these questions, and the remaining eight surveys administered this as a single question (*How would you rate your overall physical or mental health*). In this study, we analysed data for these variables from nine countries only considering that mental and physical health status are separate constructs. Each item was rated on a 5-point scale: excellent, very good, good, fair, or poor. Perceived health ratings were dichotomized into *poor* (fair/poor) versus *good* health (excellent/very good/good).

2.2.2.2. Perceived stigma, discrimination, and social network burden:. Discrete probes for perceived stigma and social network burden were available from 19 surveys ($n = 33{,}370$). Three questions were derived from the WHO Disability Assessment Schedule-II (WHODAS-II) (Alonso et al., 2013). The stigma items were: (a) *How much embarrassment did you experience because of your health problems during the past 30 days?* (none, a little, some, a lot, or extreme embarrassment?); and (b) *How much discrimination or unfair treatment did you experience because of your health problems during the past 30 days?* (none, a little, some, a lot, or extreme unfair treatment). Social network burden was based on a single question: *How much did your health-related difficulties interfere with the life and activities of your close friends and family members during the past 30 days*? (not at all, a little, some, a lot, or extremely). In accordance with past WMH research, responses to each question were first normalized (where higher scores indicated more severe ratings) and then dichotomized into high (upper quartile of the distribution) versus low levels (bottom three quartiles) (Scott et al., 2009).

2.2.3. Mental disorders

The WMH version of the CIDI assessed lifetime history of 21 mental disorders broadly classified into *mood disorders*; *anxiety disorders; behavior disorders*; *eating disorders* and *substance-use disorders* (see Supplementary Table S2c). Full details are given in several WMH publications including two recent papers on PEs (McGrath et al., 2017; McGrath et al., 2016a). Clinical reappraisal studies indicate that lifetime diagnoses based on the CIDI have good concordance with diagnoses based on blinded clinical interviews (Haro et al., 2006). In keeping with our previous research, standardised diagnostic hierarchy rules among the disorders assessed were applied where appropriate (McGrath et al., 2016a).

2.2.4. General medical conditions

General medical conditions were assessed with a standard checklist based on the US National Health Interview Survey (Edwards et al., 1994). Fourteen conditions were assessed in this study. Specifically, respondents were asked whether they had a lifetime history of arthritis, stroke, back or neck pain, other chronic pain, chronic headaches, and seasonal allergies, and whether they were ever told by a doctor of other health professional that they had cancer, heart disease, high blood pressure, diabetes, epilepsy, peptic ulcer, asthma, or chronic lung disease. Prior research has demonstrated good concordance between self-report illness and medical records (Baumeister et al., 2010).

2.3. Statistical analysis

We first examined correlations between HRQoL indicators. HRQoL ratings among respondents with and without PE were calculated using cross-tabulations. A series of logistic regression models was used to investigate the relationship between the PEs and each of the five HRQoL indicators. In keeping with past WMH research (Scott et al., 2009), we dichotomized our main outcome variables of interest in order to generate simple odds ratios for the associations between HRQoL and PEs. Analyses adjusted for country as well as: a) socio-demographic characteristics (sex, age at interview, education, employment history, marital status, household income, and nativity (Model 1); b) socio-demographic characteristics and lifetime mental disorders

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

(Model 2); c) socio-demographic characteristics and lifetime general medical conditions (Model 3), and d) all of the above (Model 4). To explore dose-response relationships between PE metrics and HRQoL, we repeated the logistic regression models within the subgroup with any PEs, using *PE type* (2 or more PE types versus 1 PE type) and *PE annualized frequency metric* (median split) as predictors of HRQoL indicators. Finally, we undertook a post-hoc analysis where we replaced the categorical mental disorders with a simpler continuous measure of general psychological distress. We have previously demonstrated an associated with PEs and the K10 (Saha et al., 2011d). The K10 is comprised of 10 symptom items that were designed to elicit information on participant's physical and psychological conditions for a period of one month prior to the survey interview (Kessler et al., 2002). The scale has been developed and validated against common mental illnesses using large population surveys having good psychometric properties (Andrews and Slade, 2001; Kessler et al., 2010).

As the WMH data are both clustered and weighted, the design-based Taylor series linearization implemented in SUDAAN software was used to estimate standard errors and evaluate the statistical significance of coefficients. All significance tests were evaluated using 0.05-level two-sided tests.

3. Results

As expected, the correlations between HRQoL indicators were moderate to high; the correlation between two perceived health status was 0.51, while the correlation between embarrassment and discrimination was 0.56; embarrassment and social network burden was 0.65; discrimination and social network burden was 0.56. Of 33,370 included respondents, the lifetime prevalence (SE) of PEs was 5.7% (0.2). Among respondents with PEs ($n = 2488$), 27.8% reported >1 PE type. The frequencies of perceived physical and mental health status are presented in Supplementary Table S3. Among those with any PEs, 47.0% (SE = 2.3) reported having fair or poor perceived physical health while 27.3% (SE = 1.8) had fair or poor perceived mental health status. The corresponding percentages for respondents without PEs were 29.5% (SE = 0.6) and 13.8% (SE = 0.4) respectively. Similar patterns were found for the PE type and frequency metrics. Supplementary Table S4 shows the proportions for perceived stigma and social network burden: 11.1% (SE = 0.9) of those with PE reported embarrassment (vs 4.1% for those without PE), 5.1% (SE = 0.7) discrimination (vs 1.7% without), and 9.6% (SE = 0.9) social network burden (vs 3.6% without).

3.1. Association between any PEs and HRQoL indicators

Table 1 summarizes the associations of any PEs with perceptions of poor health status, stigma, and social network burden. In Model 1 (adjusted for country and socio-demographic variables), any PEs were significantly associated with each of the five indicators. Specifically, respondents with PE were about two times (for physical health: OR = 1.9, 95% CI = 1.5–2.4; for mental health: OR = 2.2, 95% CI = 1.7–2.7) more likely to rate poor/fair health status those with PEs (compared with those without a PE). The odds ratios for stigma and social network burden ranged between 3.3 and 3.7 with the highest being discrimination (OR = 3.7, 95% CI = 2.6–5.2) and the lowest being social network burden (OR = 3.3, 95% CI = 2.6–4.1). After additional adjustment for mental disorders (Model 2), and physical disorders (Model 3) and all of the above (Model 4), the odds ratios were attenuated but each of the HRQoL indicators remained significantly associated with PEs. We undertook a post-hoc analysis using K10 psychological distress as a covariate along with other covariates in the main analysis - the general pattern of the results remained substantially unchanged (Supplementary Table S5). Results are compatible with psychological distress mediating the association between PEs and the HRQoL indicators.

3.2. Association between PE metrics and HRQoL indicators

Table 2 presents the associations between the PE type and frequency metrics with the five HRQoL indicators, after adjustment for country, socio-demographic characteristics, DSM-IV mental disorders, and general medical conditions. The only significant relationship observed was the association between having two or more PE types (versus 1 PE type) with higher odds of reporting perceived discrimination (OR = 2.2, 95% CI = 1.3–3.5).

4. Discussion

Based on a cross-national analysis of 19 international surveys, we found that compared to individuals without PEs, those with PEs had considerably higher odds of poor HRQoL on five indicators covering perceived physical and mental health, stigma, and social network burden. These associations persisted after adjustment for socio-demographic characteristics, 21 mental disorders, and 14 general medical conditions. Apart from an association between those with more PE types and increased perceived discrimination, there were no significant associations between other PE metrics and the HRQoL indicators. While these self-report measures are based on single, broadly-defined indicators, such

Table 1
Associations between psychotic experiences and health-related quality of life indicators (perceived health status, stigma, and social network burden)

	Model 1[c]		Model 2[d]		Model 3[e]		Model 4[f]	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
I. Perceived health status[a]								
Physical health[a,b]	1.9*	(1.5-2.4)	1.5*	(1.2-2.0)	1.5*	(1.2-2.0)	1.3*	(1.0-1.7)
Mental health	2.2*	(1.7-2.7)	1.6*	(1.3-2.0)	1.9*	(1.5-2.3)	1.5*	(1.2-1.9)
II. Perceived stigma[b]								
Embarrassment	3.5*	(2.8-4.4)	2.3*	(1.8-3.0)	2.5*	(1.9-3.2)	1.9*	(1.4-2.5)
Discrimination	3.7*	(2.6-5.2)	2.1*	(1.5-3.0)	2.5*	(1.8-3.6)	1.8*	(1.3-2.6)
III. Social network burden[b]	3.3*	(2.6-4.1)	2.1*	(1.6-2.6)	2.3*	(1.8-3.0)	1.7*	(1.3-2.2)

OR, odds ratios; CI, confidence interval.

[a] Perceived health ratings were dichotomized into "poor health" (fair/poor) and "good health" (excellent/very good/good). The sample size used for these models is 14 471.

[b] Perceived stigma and social network burden were categorized as "high level" if scores for that measure is on or above the 3rd quartile of the distribution and "low level" otherwise. The sample size used for these models is 33 370.

[a,b] Each row in the table represents a logistic regression model of any PE (ref: no PE) as predictor of i) poor health status ii) high level of stigma iii) high level of social network burden.

[c] **Model 1:** All models adjusted for country and socio-demographics variables (sex, age, education, employment history, marital status, household income, and nativity).

[d] **Model 2:** All models adjusted for country, socio-demographics variables, and 21 DSM-IV mental disorders.

[e] **Model 3:** All models adjusted for country, socio-demographics variables, and 14 general medical conditions.

[f] **Model 4:** All models adjusted for country, socio-demographics variables, 21 DSM-IV mental disorders, and 14 general medical conditions.

* Significant at the .05 level, 2-sided test.

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

Table 2
Associations between psychotic experiences (PE) related metrics (2 or more versus 1 PE type, >0.3 annualized frequency versus 0.3 or less) with health-related quality of life indicators (perceived health status, stigma, and social network burden) in the subgroup of those with PEs.

	PE type metric[c]		PE annualized frequency metric[d]	
	OR	(95% CI)	OR	(95% CI)
I. Perceived health status[a]				
Physical health	1.2	(0.8–1.9)	1.0	(0.7–1.4)
Mental health	1.3	(0.8–2.2)	0.9	(0.6–1.3)
II. Perceived stigma[b]				
Embarrassment	1.3	(0.8–2.1)	0.9	(0.6–1.2)
Discrimination	2.2*	(1.3-3.5)	1.1	(0.7–1.7)
III. Social network burden[b]	1.3	(0.9–2.0)	1.2	(0.8–1.7)

PE, psychotic experiences; OR, odds ratios; CI, confidence interval.

[a] Perceived health ratings were dichotomized into "poor health" (fair/poor) and "good health" (excellent/very good/good). The sample size used for these models is 1 263.

[b] Perceived stigma and social network burden were categorized as "high level" if scores for that measure is on or above the 3rd quartile of the distribution and "low level" otherwise. The sample size used for these models is 2 488.

[c] Each row represents a logistic regression model of 2 or more PE types (ref: 1 PE type) as predictor of i) poor perceived health status ii) high level of stigma iii) high level of social network burden adjusting for country, socio-demographics variables, 21 DSM-IV mental disorders, and 14 general medical conditions.

[d] Model specification in (c) but each row now represents a logistic regression model of 0.4 or more episodes per year (ref: ≤0.3 episodes per year) as predictor of i) poor health status ii) high level of stigma iii) high level of social network burden adjusting for country, socio-demographics variables, 21 DSM-IV mental disorders, and 14 general medical conditions.

* Significant at the 0.05 level, 2-sided test.

indicators are of interest from the perspective of patient-centred outcomes (i.e. pragmatic outcomes that are more salient to affected individuals than many traditional health metrics) (Rohrer et al., 2007).

Our findings indicate that individuals with PEs are more likely to report both impaired perceived mental and physical status. Two recent studies from WHO WMH surveys reported that PEs were independently associated with several domains of disability regardless of mental or general medical conditions, and that mental-physical co-morbidity exerts modest synergistic effects on disability related outcomes (Navarro-Mateu et al., 2017; Scott et al., 2009). Overall, these findings are of interest as studies have suggested that simple, short indicators related to perceived health status may have utility in screening for individuals who warrant additional assessment and intervention (Ahmad et al., 2014; Burstrom and Fredlund, 2001; DeSalvo et al., 2005; Mavaddat et al., 2014; Olson et al., 2016). In our study, we found that PEs were associated with higher levels of stigma (both embarrassment, discrimination) and social network burden. Our results are congruent with a recent study reporting an association between PEs and perceived stigma in a non-clinical sample from Taiwan (Lien et al., 2015), although the study was limited to a small sample size and did not control for general medical conditions or mental disorders.

4.1. Strengths and limitations

While our study has several strengths (e.g. a large sample size from a range of countries, a uniform methodology for population sampling and data collection, and innovative PE-related metrics), several limitations deserve consideration. First, in keeping with other population-based surveys, evaluations relied on lay interviewers to administer the questionnaire, the CIDI 3.0, and there was no access to clinical validations of psychotic disorders. We excluded those with PEs who screened positive for possible psychotic disorders, however, we did not have access to valid measures of clinical psychotic disorders in our sample, and thus it is possible that a small proportion of respondents with a clinical diagnosis involving psychosis were included in the analyses. Second, our analyses were cross-sectional and the variables of interest were assessed across different time periods (the HRQoL measures were for present state or last 30 days; PEs were for lifetime). Thus, our findings do not allow inferences about causal directions between the variables of interest. Third, because of the subjective and nuanced nature of HRQoL outcomes (Alonso et al., 2013; Fleishman and Zuvekas, 2007; Tas et al., 2007), a thorough analysis would require more detailed, qualitative research. Finally, in keeping with the first wave of PEs studies, we have focused on PEs as a class. Future studies may wish to explore if particular types of HRQoL are associated with particular types of PE types (e.g. high discrimination associated with delusional experiences). Similarly, future studies may also explore the subjective nature of the HRQoL and its relation to PEs between countries, which may have some clinical as well as public health interest in different country settings.

4.2. Implications

While the simple, self-rated probes used in this study cannot fully capture the complexity of these HRQoL constructs, our study confirmed that those with PEs have suboptimal outcomes on HRQoL indicators. Our findings are consistent with the previous literature (Janssen et al., 2003; Lien et al., 2015; Oh et al., 2014) and extend our previous findings reporting an association between PEs and disability on cognitive, social, and role impairment domains (Navarro-Mateu et al., 2017). Importantly, the relationships between PEs and HRQoL persisted when adjusted for both mental and physical disorders, indicating that isolated PEs are associated with adverse health outcomes. Because these HRQoL are simple and quick to ask, and may help predict later adverse health outcomes, these indicators are increasingly being considered to help select individuals for evidence-based preventive interventions (Ahmad et al., 2014; Idler and Benyamini, 1997; Mavaddat et al., 2014). Such use has proven feasible and effective in some fields of clinical practice (Rosenzveig et al., 2014; Sattler et al., 2017). Additional research is needed to confirm if these indicators are also predictive of adverse outcomes in mental health settings.

Author contributions

Access to data: Ronald Kessler, Nancy Sampson have full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. All reports in this study contain original data.

Acquisition, analysis, or interpretation of data: Aguilar-Gaxiola, Al-Hamzawi, Benjet, Degenhardt, Girolamo,Esan, Florescu, Gureje, Haro, Hu, EG Karam, G Karam, Kovess- Masfety, Lepine, Lee, Lim, Mneimneh, Navarro-Mateu, Posada-Villa, Sampson, Scott, Stagnaro, ten Have, Viana, Kessler.

Drafting of the manuscript: Saha, McGrath, Alonso, Kessler.

Critical revision of the manuscript for important intellectual content: Alonso, Bromet, McGrath, Saha, Florescu, Kovess-Masfety, Lim, Navarro-Mateu, Kessler.

Statistical analysis: Ronald Kessler, John McGrath, and Carmen Lim conducted and are responsible for the data analysis.

Funding acknowledgements

The World Health Organization World Mental Health (WMH) Survey Initiative is supported by the United States National Institute of Mental Health (NIMH; R01 MH070884), the John D. and Catherine T. MacArthur Foundation, the Pfizer Foundation, the United States Public Health Service (R13-MH066849, R01-MH069864, and R01 DA016558), the Fogarty International Center (FIRCA R03-TW006481), the Pan American Health Organization, Eli Lilly and Company, Ortho-McNeil Pharmaceutical Inc., GlaxoSmithKline, and Bristol-Myers Squibb. We thank the staff of the WMH Data Collection and Data Analysis Coordination Centres for assistance with instrumentation, fieldwork, and consultation on data analysis. None of the funders had any role in the design, analysis, interpretation of results, or preparation of this paper.

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

The views and opinions expressed in this report are those of the authors and should not be construed to represent the views of the World Health Organization, other sponsoring organizations, agencies, or governments.

The Argentina survey – Estudio Argentino de Epidemiología en Salud Mental (EASM) – was supported by a grant from the Argentinian Ministry of Health (Ministerio de Salud de la Nación). The São Paulo Megacity Mental Health Survey is supported by the State of São Paulo Research Foundation (FAPESP) Thematic Project Grant 03/00204-3. The Colombian National Study of Mental Health (NSMH) is supported by the Ministry of Social Protection. The ESEMeD project is funded by the European Commission (Contracts QLG5-1999-01042; SANCO 2004123, and EAHC 20081308), the Piedmont Region (Italy)), Fondo de Investigación Sanitaria, Instituto de Salud Carlos III, Spain (FIS 00/0028), Ministerio de Ciencia y Tecnología, Spain (SAF2000-158-CE), Departament de Salut, Generalitat de Catalunya, Spain, DIUEde la Generalitat de Catalunya (2017 SGR 452; 2014 SGR 748), Instituto de Salud Carlos III (CIBER CB06/02/0046, RETICS RD06/0011 REM-TAP), and other local agencies and by an unrestricted educational grant from GlaxoSmithKline. Implementation of the Iraq Mental Health Survey (IMHS) and data entry were carried out by the staff of the Iraqi MOH and MOP with direct support from the Iraqi IMHS team with funding from both the Japanese and European Funds through United Nations Development Group Iraq Trust Fund (UNDG ITF). The Lebanese Evaluation of the Burden of Ailments and Needs Of the Nation (L.E.B.A.-N.O.N.) is supported by the Lebanese Ministry of Public Health, the WHO (Lebanon), National Institute of Health/Fogarty International Center (R03 TW006481-01), anonymous private donations to IDRAAC, Lebanon, and unrestricted grants from, Algorithm, AstraZeneca, Benta, Bella Pharma, Eli Lilly, Glaxo Smith Kline, Lundbeck, Novartis, OmniPharma, Pfizer, Phenicia, Servier, UPO. The Mexican National Comorbidity Survey (MNCS) is supported by The National Institute of Psychiatry Ramón de la Fuente Muñiz (INPRFMDIES 4280) and by the National Council on Science and Technology (CONACyT-G30544- H), with supplemental support from the PanAmerican Health Organization (PAHO). Te Rau Hinengaro: The New Zealand Mental Health Survey (NZMHS) is supported by the New Zealand Ministry of Health, Alcohol Advisory Council of New Zealand, and the Health Research Council. The Nigerian Survey of Mental Health and Wellbeing (NSMHW) is supported by the WHO (Geneva), the WHO (Nigeria), and the Federal Ministry of Health, Abuja, Nigeria. The Peruvian World Mental Health Study was funded by the National Institute of Health of the Ministry of Health of Peru. The Portuguese Mental Health Study was carried out by the Department of Mental Health, Faculty of Medical Sciences, NOVA University of Lisbon, with collaboration of the Portuguese Catholic University, and was funded by Champalimaud Foundation, Gulbenkian Foundation, Foundation for Science and Technology (FCT) and Ministry of Health. The Romania WMH study projects “Policies in Mental Health Area” and “National Study regarding Mental Health and Services Use” were carried out by National School of Public Health & Health Services Management (former National Institute for Research & Development in Health, present National School of Public Health Management & Professional Development, Bucharest), with technical support of Metro Media Transilvania, the National Institute of Statistics – National Centre for Training in Statistics, SC. Cheyenne Services SRL, Statistics Netherlands and were funded by Ministry of Public Health (former Ministry of Health) with supplemental support of Eli Lilly Romania SRL. The Shenzhen Mental Health Survey is supported by the Shenzhen Bureau of Health and the Shenzhen Bureau of Science, Technology, and Information. The US National Comorbidity Survey Replication (NCS-R) is supported by the National Institute of Mental Health (NIMH; U01-MH60220) with supplemental support from the National Institute of Drug Abuse (NIDA), the Substance Abuse and Mental Health Services Administration (SAMHSA), the Robert Wood Johnson Foundation (RWJF; Grant 044708), and the John W. Alden Trust. Professor McGrath received John Cade Fellowship APP1056929 from the National Health and Medical Research Council and Niels Bohr Professorship from the Danish National Research Foundation.

A complete list of all within-country and cross-national WMH publications can be found at http://www.hcp.med.harvard.edu/wmh/.

Competing interests

In the past 3 years, Dr. Kessler received support for his epidemiological studies from Sanofi Aventis; was a consultant for Johnson & Johnson Wellness and Prevention, Shire, Takeda; and served on an advisory board for the Johnson & Johnson Services Inc. Lake Nona Life Project. Kessler is a co-owner of DataStat, Inc., a market research firm that carries out healthcare research.

Role of the funding source

The funding sources had no role in the analyses, interpretation of the data, or decision to submit results.

Acknowledge WMH collaborators

The WHO World Mental Health Survey collaborators are: Sergio Aguilar-Gaxiola, MD, PhD, Ali Al-Hamzawi, MD, Mohammed Salih Al-Kaisy, MD, Jordi Alonso, MD, PhD, Laura Helena Andrade, MD, PhD, Corina Benjet, PhD, Guilherme Borges, ScD, Evelyn J. Bromet, PhD, Ronny Bruffaerts, PhD, Brendan Bunting, PhD, Jose Miguel Caldas de Almeida, MD, PhD, Graça Cardoso, MD, PhD, Somnath Chatterji, MD, Alfredo H. Cia, MD, Louisa Degenhardt, PhD, Koen Demyttenaere, MD, PhD, John Fayyad, MD, Silvia Florescu, MD, PhD, Giovanni de Girolamo, MD, Oye Gureje, MD, DSc, FRCPsych, Josep Maria Haro, MD, PhD, Hristo Hinkov, MD, PhD, Chi-yi Hu, MD, PhD, Peter de Jonge, PhD, Aimee Nasser Karam, PhD, Elie G. Karam, MD, Norito Kawakami, MD, DMSc, Ronald C. Kessler, PhD, Andrzej Kiejna, MD, PhD, Viviane Kovess-Masfety, MD, PhD, Sing Lee, MB, BS, Jean-Pierre Lepine, MD, Daphna Levinson, PhD, John McGrath, MD, PhD, Maria Elena Medina-Mora, PhD, Zeina Mneimneh, PhD, Jacek Moskalewicz, PhD, Fernando Navarro-Mateu, MD, PhD, Beth-Ellen Pennell, MA, Marina Piazza, MPH, ScD, Jose Posada-Villa, MD, Kate M. Scott, PhD, Tim Slade, PhD, Juan Carlos Stagnaro, MD, PhD, Dan J. Stein, FRCPC, PhD, Margreet ten Have, PhD, Yolanda Torres, MPH, Dra.HC, Maria Carmen Viana, MD, PhD, Harvey Whiteford, MBBS, PhD, David R. Williams, MPH, PhD, Bogdan Wojtyniak, ScD.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.schres.2018.04.044.

References

Ahmad, F., Jhajj, A.K., Stewart, D.E., Burghardt, M., Bierman, A.S., 2014. Single item measures of self-rated mental health: a scoping review. BMC Health Serv. Res. 14, 398.

Alonso, J., Vilagut, G., Adroher, N.D., Chatterji, S., He, Y., Andrade, L.H., Bromet, E., Bruffaerts, R., Fayyad, J., Florescu, S., de Girolamo, G., Gureje, O., Haro, J.M., Hinkov, H., Hu, C., Iwata, N., Lee, S., Levinson, D., Lepine, J.P., Matschinger, H., Medina-Mora, M.E., O'Neill, S., Ormel, J.H., Posada-Villa, J.A., Ismet Taib, N., Xavier, M., Kessler, R.C., 2013. Disability mediates the impact of common conditions on perceived health. PLoS One 8 (6), e65858.

Andrews, G., Slade, T., 2001. Interpreting scores on the Kessler psychological distress scale (K10). Aust. N. Z. J. Public Health 25 (6), 494–497.

Baumeister, H., Kriston, L., Bengel, J., Harter, M., 2010. High agreement of self-report and physician-diagnosed somatic conditions yields limited bias in examining mental-physical comorbidity. J. Clin. Epidemiol. 63 (5), 558–565.

Burstrom, B., Fredlund, P., 2001. Self rated health: is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? J. Epidemiol. Community Health 55 (11), 836–840.

Carlson, B., Pozehl, B., Hertzog, M., Zimmerman, L., Riegel, B., 2013. Predictors of overall perceived health in patients with heart failure. J. Cardiovasc. Nurs. 28 (3), 206–215.

Chien, W.T., Yeung, F.K., Chan, A.H., 2014. Perceived stigma of patients with severe mental illness in Hong Kong: relationships with patients' psychosocial conditions and

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

attitudes of family caregivers and health professionals. Admin. Pol. Ment. Health 41 (2), 237–251.

Corrigan, P.W., Morris, S.B., Michaels, P.J., Rafacz, J.D., Rusch, N., 2012. Challenging the public stigma of mental illness: a meta-analysis of outcome studies. Psychiatr. Serv. 63 (10), 963–973.

DeSalvo, K.B., Fan, V.S., McDonell, M.B., Fihn, S.D., 2005. Predicting mortality and healthcare utilization with a single question. Health Serv. Res. 40 (4), 1234–1246.

DeVylder, J.E., Burnette, D., Yang, L.H., 2014. Co-occurrence of psychotic experiences and common mental health conditions across four racially and ethnically diverse population samples. Psychol. Med. 44 (16), 3503–3513.

Edwards, W.S., Winn, D.M., Kurlantzick, V., Sheridan, S., Berk, M.L., Retchin, S., Collins, J.G., 1994. Evaluation of National Health Interview survey diagnostic reporting. Vital Health Stat. 2, 1–116.

Fisher, H.L., Caspi, A., Poulton, R., Meier, M.H., Houts, R., Harrington, H., Arseneault, L., Moffitt, T.E., 2013. Specificity of childhood psychotic symptoms for predicting schizophrenia by 38 years of age: a birth cohort study. Psychol. Med. 43 (10), 2077–2086.

Fleishman, J.A., Zuvekas, S.H., 2007. Global self-rated mental health: associations with other mental health measures and with role functioning. Med. Care 45 (7), 602–609.

Haro, J.M., Arbabzadeh-Bouchez, S., Brugha, T.S., de Girolamo, G., Guyer, M.E., Jin, R., Lepine, J.P., Mazzi, F., Reneses, B., Vilagut, G., Sampson, N.A., Kessler, R.C., 2006. Concordance of the composite international diagnostic interview version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health surveys. Int. J. Methods Psychiatr. Res. 15 (4), 167–180.

Henderson, C., Noblett, J., Parke, H., Clement, S., Caffrey, A., Gale-Grant, O., Schulze, B., Druss, B., Thornicroft, G., 2014. Mental health-related stigma in health care and mental health-care settings. Lancet Psych. 1 (6), 467–482.

Idler, E.L., Benyamini, Y., 1997. Self-rated health and mortality: a review of twenty-seven community studies. J. Health Soc. Behav. 38 (1), 21–37.

Janssen, I., Hanssen, M., Bak, M., Bijl, R.V., de Graaf, R., Vollebergh, W., McKenzie, K., van Os, J., 2003. Discrimination and delusional ideation. Br. J. Psychiatry 182, 71–76.

Kaymaz, N., Drukker, M., Lieb, R., Wittchen, H.U., Werbeloff, N., Weiser, M., Lataster, T., van Os, J., 2012. Do subthreshold psychotic experiences predict clinical outcomes in unselected non-help-seeking population-based samples? A systematic review and meta-analysis, enriched with new results. Psychol. Med. 42, 2239–2253.

Kelleher, I., Lynch, F., Harley, M., Molloy, C., Roddy, S., Fitzpatrick, C., Cannon, M., 2012. Psychotic symptoms in adolescence index risk for suicidal behavior: findings from 2 population-based case-control clinical interview studies. Arch. Gen. Psychiatry 69 (12), 1277–1283.

Kelleher, I., Wigman, J.T., Harley, M., O'Hanlon, E., Coughlan, H., Rawdon, C., Murphy, J., Power, E., Higgins, N.M., Cannon, M., 2015. Psychotic experiences in the population: association with functioning and mental distress. Schizophr. Res. 165 (1), 9–14.

Kessler, R.C., Üstün, T.B., 2004. The world mental health (WMH) survey initiative version of the World Health Organization (WHO) composite international diagnostic interview (CIDI). Int. J. Methods Psychiatr. Res. 13 (2), 93–121.

Kessler, R.C., Ustun, T.B., 2008. The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders. Cambridge University Press, New York.

Kessler, R.C., Üstün, T.B., 2008. The World Health Organization composite international diagnostic interview. In: Kessler, R.C., Üstün, T.B. (Eds.), The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders. Cambridge University Press, New York, pp. 58–90.

Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S.L., Walters, E.E., Zaslavsky, A.M., 2002. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol. Med. 32 (6), 959–976.

Kessler, R.C., Haro, J.M., Heeringa, S.G., Pennell, B.E., Ustun, T.B., 2006. The World Health Organization World Mental Health Survey Initiative. Epidemiol. Psichiatr. Soc. 15 (3), 161–166.

Kessler, R.C., Green, J.G., Gruber, M.J., Sampson, N.A., Bromet, E., Cuitan, M., Furukawa, T.A., Gureje, O., Hinkov, H., Hu, C.Y., Lara, C., Lee, S., Mneimneh, Z., Myer, L., Oakley-Browne, M., Posada-Villa, J., Sagar, R., Viana, M.C., Zaslavsky, A.M., 2010. Screening for serious mental illness in the general population with the K6 screening scale: results from the WHO World Mental Health (WMH) survey initiative. Int. J. Methods Psychiatr. Res. 19 (Suppl. 1), 4–22.

Lien, Y.J., Kao, Y.C., Liu, Y.P., Chang, H.A., Tzeng, N.S., Lu, C.W., Lin, S.J., Loh, C.H., 2015. Relationships of perceived public stigma of mental illness and psychosis-like experiences in a non-clinical population sample. Soc. Psychiatry Psychiatr. Epidemiol. 50 (2), 289–298.

Linscott, R.J., van Os, J., 2013. An updated and conservative systematic review and meta-analysis of epidemiological evidence on psychotic experiences in children and adults: on the pathway from proneness to persistence to dimensional expression across mental disorders. Psychol. Med. 43 (6), 1133–1149.

Machacova, K., Lysack, C., Neufeld, S., 2011. Self-rated health among persons with spinal cord injury: what is the role of physical ability? J. Spinal Cord Med. 34 (3), 265–272.

Mavaddat, N., Parker, R.A., Sanderson, S., Mant, J., Kinmonth, A.L., 2014. Relationship of self-rated health with fatal and non-fatal outcomes in cardiovascular disease: a systematic review and meta-analysis. PLoS One 9 (7), e103509.

McGrath, J.J., Saha, S., Al-Hamzawi, A., Alonso, J., Bromet, E.J., Bruffaerts, R., Caldas-de-Almeida, J.M., Chiu, W.T., de Jonge, P., Fayyad, J., Florescu, S., Gureje, O., Haro, J.M., Hu, C., Kovess-Masfety, V., Lepine, J.P., Lim, C.C., Mora, M.E., Navarro-Mateu, F., Ochoa, S., Sampson, N., Scott, K., Viana, M.C., Kessler, R.C., 2015. Psychotic experiences in the general population: a cross-national analysis based on 31261 respondents from 18 countries. JAMA Psychiat. 72 (7), 697–705.

McGrath, J.J., Saha, S., Al-Hamzawi, A., Andrade, L., Benjet, C., Bromet, E.J., Browne, M.O., Caldas de Almeida, J.M., Chiu, W.T., Demyttenaere, K., Fayyad, J., Florescu, S., de Girolamo, G., Gureje, O., Haro, J.M., Ten Have, M., Hu, C., Kovess-Masfety, V., Lim, C.C., Navarro-Mateu, F., Sampson, N., Posada-Villa, J., Kendler, K.S., Kessler, R.C., 2016a. The bidirectional associations between psychotic experiences and DSM-IV mental disorders. Am. J. Psychiatry 173 (10), 997–1006.

McGrath, J.J., Saha, S., Al-Hamzawi, A.O., Alonso, J., Andrade, L., Borges, G., Bromet, E.J., Oakley Browne, M., Bruffaerts, R., Caldas de Almeida, J.M., Fayyad, J., Florescu, S., de Girolamo, G., Gureje, O., Hu, C., de Jonge, P., Kovess-Masfety, V., Lepine, J.P., Lim, C.C., Navarro-Mateu, F., Piazza, M., Sampson, N., Posada-Villa, J., Kendler, K.S., Kessler, R.C., 2016b. Age of onset and lifetime projected risk of psychotic experiences: cross-national data from the world mental health survey. Schizophr. Bull. 42 (4), 933–941.

McGrath, J.J., McLaughlin, K.A., Saha, S., Aguilar-Gaxiola, S., Al-Hamzawi, A., Alonso, J., Bruffaerts, R., de Girolamo, G., de Jonge, P., Esan, O., Florescu, S., Gureje, O., Haro, J.M., Hu, C., Karam, E.G., Kovess-Masfety, V., Lee, S., Lepine, J.P., Lim, C.C., Medina-Mora, M.E., Mneimneh, Z., Pennell, B.E., Piazza, M., Posada-Villa, J., Sampson, N., Viana, M.C., Xavier, M., Bromet, E.J., Kendler, K.S., Kessler, R.C., 2017. The association between childhood adversities and subsequent first onset of psychotic experiences: a cross-national analysis of 23 998 respondents from 17 countries. Psychol. Med. 47, 1230–1245.

Moreno, C., Nuevo, R., Chatterji, S., Verdes, E., Arango, C., Ayuso-Mateos, J.L., 2013. Psychotic symptoms are associated with physical health problems independently of a mental disorder diagnosis: results from the WHO World Health Survey. World Psych. 12 (3), 251–257.

Navarro-Mateu, F., Alonso, J., Lim, C.C.W., Saha, S., Aguilar-Gaxiola, S., Al-Hamzawi, A., Andrade, L.H., Bromet, E.J., Bruffaerts, R., Chatterji, S., Degenhardt, L., de Girolamo, G., de Jonge, P., Fayyad, J., Florescu, S., Gureje, O., Haro, J.M., Hu, C., Karam, E.G., Kovess-Masfety, V., Lee, S., Medina-Mora, M.E., Ojagbemi, A., Pennell, B.E., Piazza, M., Posada-Villa, J., Scott, K.M., Stagnaro, J.C., Xavier, M., Kendler, K.S., Kessler, R.C., McGrath, J.J., Collaborators, W.H.O.W.M.H.S, 2017. The association between psychotic experiences and disability: results from the WHO World Mental Health Surveys. Acta Psychiatr. Scand. 136 (1), 74–84.

Newlin, M., Webber, M.P., Morris, D., Howarth, S., 2015. Social participation interventions for adults with mental health problems: a review and narrative synthesis. Soc. Work Res. Abstr. 39, 167–180.

Oh, H., DeVylder, J., 2015. Psychotic symptoms predict health outcomes even after adjusting for substance use, smoking and co-occurring psychiatric disorders: findings from the NCS-R and NLAAS. World Psych. 14 (1), 101–102.

Oh, H., Yang, L.H., Anglin, D.M., DeVylder, J.E., 2014. Perceived discrimination and psychotic experiences across multiple ethnic groups in the United States. Schizophr. Res. 157 (1–3), 259–265.

Oh, H., Koyanagi, A., Kelleher, I., DeVylder, J., 2017. Psychotic experiences and disability: findings from the collaborative psychiatric epidemiology surveys. Schizophr. Res. 193, 343–347.

Olson, K.L., Stiefel, M., Ross, C., Stadler, S., Hornak, R., Sandhoff, B., Merenich, J.A., 2016. Self-rated health among patients with coronary artery disease enrolled in a cardiovascular risk reduction service. Popul. Health Manag. 19 (1), 24–30.

Patten, S.B., Williams, J.V., Lavorato, D.H., Bulloch, A.G., Charbonneau, M., Gautam, M., Moss, P., Abbey, S., Stuart, H., 2016. Perceived stigma among recipients of mental health care in the general Canadian population. Can. J. Psychiatr. 61 (8), 480–488.

Reavley, N.J., Jorm, A.F., 2011. Stigmatizing attitudes towards people with mental disorders: findings from an Australian National Survey of mental health literacy and stigma. Aust. N. Z. J. Psychiatry 45 (12), 1086–1093.

Rohrer, J.E., Arif, A., Denison, A., Young, R., Adamson, S., 2007. Overall self-rated health as an outcome indicator in primary care. J. Eval. Clin. Pract. 13 (6), 882–888.

Rosenzveig, A., Kuspinar, A., Daskalopoulou, S.S., Mayo, N.E., 2014. Toward patient-centered care: a systematic review of how to ask questions that matter to patients. Medicine (Baltimore) 93 (22), e120.

Saha, S., Scott, J., Varghese, D., McGrath, J.J., 2011a. The association between physical health and delusional-like experiences: a general population study. PLoS One 6 (4), e18566.

Saha, S., Scott, J.G., Johnston, A.K., Slade, T.N., Varghese, D., Carter, G.L., McGrath, J.J., 2011b. The association between delusional-like experiences and suicidal thoughts and behaviour. Schizophr. Res. 132 (2–3), 197–202.

Saha, S., Scott, J.G., Varghese, D., Degenhardt, L., Slade, T., McGrath, J.J., 2011c. The association between delusional-like experiences, and tobacco, alcohol or cannabis use: a nationwide population-based survey. BMC Psychiatry 11, 202–210.

Saha, S., Scott, J.G., Varghese, D., McGrath, J.J., 2011d. The association between general psychological distress and delusional-like experiences: a large population-based study. Schizophr. Res. 127 (1–3), 246–251.

Sattler, A.F., Tiede, M.S., Dammann, J.E., Jensen, A.H., Walton, G.A., Whiteside, S.P.H., 2017. Utility of a single-item child anxiety rating for use in community practice. Prof. Psychol. 48, 259–266.

Scott, K.M., Von Korff, M., Alonso, J., Angermeyer, M.C., Bromet, E., Fayyad, J., de Girolamo, G., Demyttenaere, K., Gasquet, I., Gureje, O., Haro, J.M., He, Y., Kessler, R.C., Levinson, D., Medina Mora, M.E., Oakley Browne, M., Ormel, J., Posada-Villa, J., Watanabe, M., Williams, D., 2009. Mental-physical co-morbidity and its relationship with disability: results from the World Mental Health Surveys. Psychol. Med. 39 (1), 33–43.

Selten, J.P., Cantor-Graae, E., 2005. Social defeat: risk factor for schizophrenia? Br. J. Psychiatry 187, 101–102.

Selten, J.P., van der Ven, E., Rutten, B.P., Cantor-Graae, E., 2013. The social defeat hypothesis of schizophrenia: an update. Schizophr. Bull. 39 (6), 1180–1186.

Semrau, M., Evans-Lacko, S., Koschorke, M., Ashenafi, L., Thornicroft, G., 2015. Stigma and discrimination related to mental illness in low- and middle-income countries. Epidemiol. Psychiatr. Sci. 24 (5), 382–394.

Tas, U., Verhagen, A.P., Bierma-Zeinstra, S.M., Odding, E., Koes, B.W., 2007. Prognostic factors of disability in older people: a systematic review. Br. J. Gen. Pract. 57 (537), 319–323.

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044

Thornicroft, G., Brohan, E., Rose, D., Sartorius, N., Leese, M., 2009. Global pattern of experienced and anticipated discrimination against people with schizophrenia: a cross-sectional survey. Lancet 373 (9661), 408–415.

Van Brakel, W.H., 2006. Measuring health-related stigma–a literature review. Psychol. Health Med. 11 (3), 307–334.

Wahl, O.F., 2012. Stigma as a barrier to recovery from mental illness. Trends Cogn. Sci. 16 (1), 9–10.

World Health Organization, 2001. The World Health Report 2001. Mental Health. New Understanding, New Hope. World Health Organization, Geneva.

Please cite this article as: Alonso, J., et al., The association between psychotic experiences and health-related quality of life: a cross-national analysis based on World Mental ..., Schizophr. Res. (2018), https://doi.org/10.1016/j.schres.2018.04.044