

Effects of the diagnostic label “schizophrenia”, actively used or passively accepted, on general practitioners’ views of this disorder.

INTERNATIONAL JOURNAL OF SOCIAL PSYCHIATRY – IN PRESS

Accepted: 2.2.2017

Lorenza Magliano, Antonella Strino, Rosanna Punzo, Roberta Acone, Gaetana Affuso, John Read

Corresponding author: Lorenza Magliano, Department of Psychology, Campania University “Luigi Vanvitelli”, Caserta, Italy; Viale Ellittico 31, 81100 Caserta, Italy; e-mail: lorenza.magliano@unina2.it

Abstract

Background. General Practitioners (GPs) play a key-role in the care of somatic and psychiatric problems in People With Schizophrenia (PWS). It is probable that, like other health professionals, GPs are not all free of prejudices towards PWS. In clinical practice, GPs sometimes interact with clients diagnosed with schizophrenia by specialists, passively accepting this diagnosis. Other times, GPs interact with clients having symptoms of schizophrenia but who have not been diagnosed. In this case, GPs are expected to actively make a diagnosis. Giving the key-role of GPs in the process of care, it is worthwhile examining whether passive acceptance and active usage of the diagnosis schizophrenia have differential effects on GPs' attitudes toward people with this disorder.

Aims. To investigate GPs' views of schizophrenia and whether they were influenced by a "schizophrenia" label, passively accepted or actively used.

Methods. Four-hundred and thirty randomly selected GPs were invited to complete a questionnaire about their views of schizophrenia, either after reading a description of this disorder and making a diagnosis, or without being provided with a description but passively accepting the label "schizophrenia" given in the questionnaire.

Results. The GPs who passively accepted the label schizophrenia (N=195) and those who actively identified schizophrenia from the description (N=127) had similar views. Compared to the GPs who did not identify schizophrenia in the description (N=65), those who used the diagnosis, actively or passively: more frequently reported heredity and less frequently psychosocial factors as causes of the disorder; were more sceptical about recovery; were more convinced of the need for long-term pharmacotherapies, believed more strongly that PWS should be discriminated against when in medical hospital; and perceived PWS as more dangerous and as kept at greater social distance.

Conclusions. The diagnosis "schizophrenia", however used, is associated with pessimistic views. Stigma education should be provided to GPs.

Effects of the diagnostic label “schizophrenia”, actively used or passively accepted, on general practitioners’ views of this disorder.

Introduction

People diagnosed With Schizophrenia (PWS) have an average life expectancy nearly 25 years shorter than the general population (Saha, Chant, & McGrath, 2007), including higher risks of morbidity (Leucht, Burkard, Henderson, Maj, & Sartorius, 2007) and mortality for physical diseases (Capasso, Lineberry, Bostwick, Decker, & Sauver, 2008). Lifetime prevalence of cardiovascular and metabolic diseases is higher in PWS than in the general population (Vancampfort et al., 2015), and mortality for cancer is 50% higher (Howard et al., 2010). It has been found that half of PWS have undiagnosed medical illnesses (De Hert et al., 2011), especially cardiovascular and pulmonary diseases (Laursen, Munk-Olsen, & Gasse, 2011). They also receive fewer general medical checkups, blood pressure and cholesterol checks than other patient groups (Roberts, Roalfe, Wilson, & Lester, 2007).

Suboptimal health care for PWS may be related to some physicians’ limited knowledge of this disorder, and/or negative attitudes towards people with severe mental health problems (Solar, 2002; Liggins & Hatcher, 2005; Ucock et al., 2006; Corrigan et al., 2014; Henderson et al., 2014). Studies have revealed that physicians sometimes do not take the medical needs of PWS seriously, and that they tend to associate patient’s physical complaints with mental illness (Shefer, Henderson, Howard, Murray, & Thornicroft, 2014) and to underestimate medical symptom severity (Thornicroft, Rose, & Kassam, 2007). It has been also reported that when people with mental health problems are in hospital for physical health problems, some staff sometimes treat them with disrespect, keep them apart from the other patients, and transfer them to a psychiatric unit as soon as possible (Liggins & Hatcher, 2005; Thornicroft et al., 2009; Harangozo et al., 2014). Studies have also found that health care providers with stigmatizing attitudes about people with mental health problems are likely to be more skeptical about adherence to treatment, and less likely to refer PWS to a physical specialist when appropriate (Corrigan et al., 2014; Reavley, Mackinnon, Morgan, & Jorm, 2014; Sullivan et al., 2015; Mittal et al., 2016). The promotion of a biogenetic model of schizophrenia in health contexts (Ahn, Proctor, & Flanagan, 2009) and in relation to the general population (Kvaale, Gottdiener, & Haslam, 2013) appears to have strengthened the view of schizophrenia as a chronic illness requiring control by life-time pharmacological treatment (Phelan, Yang, & Cruz-Rojas, 2006), and the perception of PWS as dangerous, unpredictable, and unable to control their behavior (Kvaale et al., 2013; Read, Haslam, & Magliano, 2013).

General Practitioners (GPs) play a key role in the diagnosis and treatment of somatic and psychiatric problems in PWS (Simon et al., 2005), and in the provision of counseling and family advice (Carr et al., 2004). In some countries most PWS have regular contact with their GP and receive adequate level of care for their mental or somatic problems (Oud et al. 2010; Hetlevik, Solheim, & Gjesdal, 2015), while in other countries this is not the case (Roberts et al., 2007; Irfan, Caldas de Almeida, Irfan, Raza, & Farooq, 2015).

It is probable that, like other health professionals, GPs are not all free of stereotypes and prejudices toward PWS (Mittal et al., 2014; Sullivan et al., 2015). Studies examining GPs' beliefs about people diagnosed with severe mental health problems reported that they tend to have low levels of sympathy toward people who self-harm (Goldney & Bottrill, 1980; Parker et al., 2001), believe that it is difficult to talk with mentally ill persons, and view them as dangerous and unpredictable (Parker et al., 2001; Adewuya & Oguntade, 2007). For instance, of 106 GPs in Turkey (Ucok et al., 2006), 28% viewed PWS as dangerous, 46% as untrustworthy, and 23% did not believe that they could recover even if treated. Other studies revealed that GPs have more negative attitudes toward PWS than toward otherwise identical persons diagnosed as having depression (Lawrie et al., 1996; Jorm, Korten, Jacomb, Christensen, & Henderson, 1999). In particular, GPs seem to consider patients' pain complaints to be psychological rather than physical in origin more frequently if presented by PWS than by persons with depression (Lam, Lam, Lam, & Ku, 2013) and GPs are more pessimistic about prognosis in schizophrenia (Goldney & Bottrill, 1983).

Studies also suggest that GPs' views of PWS are negatively influenced by the diagnostic label "schizophrenia" (Buchanan & Bhugra, 1992; Lawrie et al., 1996; Mittal et al., 2014; Sullivan et al., 2015). Studies about the effect of the diagnosis "schizophrenia" on health professionals' attitudes toward people with this disorder often use case vignettes with or without the diagnostic label. When two samples of London GPs (Lawrie et al., 1998) were sent a case vignette of an identical person, those whose vignette was labeled as "schizophrenia" were more likely to think that they would be violent, and less willing to have them on their practice list. However, this design does not allow differentiation between the effect of passively being presented with the label and the effect of actively diagnosing someone (Morgan, Reavley, & Jorm, 2014; Sullivan et al., 2015; Imhoff, 2016). Other studies compared attitudes towards PWS among medical students who identified schizophrenia in a clinical description vs. those who did not (Magliano et al., 2011). These studies found that labeling a case as schizophrenia was associated with pessimism about recovery and with perception of higher social distance from persons with this diagnosis. However, this design did not allow one to distinguish the effect of diagnostic competence (i.e., actively diagnosing someone as having "schizophrenia") from that of the label "schizophrenia" per se on respondents' attitudes.

In clinical practice, GPs sometimes interact with clients diagnosed as having schizophrenia by specialists, passively accepting this diagnosis. Other times, GPs interact with clients having symptoms indicative of to

schizophrenia and not diagnosed yet. In this case, GPs may be asked to actively to make a diagnosis and provide the appropriate treatments. Giving the key-role of GPs in the process of care, it is worthwhile to examine whether passive acceptance and active usage of the diagnosis schizophrenia has differential effects on GPs' attitudes toward people with this disorder.

In this paper, we report the results of a study investigating views of schizophrenia in a randomly selected sample of registered GPs in Italy. We examined whether GPs' views varied in relation to GPs' active usage or passive acceptance of the diagnostic label "schizophrenia". To our knowledge, this is the first study exploring GPs' views of schizophrenia in relation to this active-passive dichotomy. We also re-examined previous findings that the label is related to negative attitudes, by comparing scores between those who employed the label (actively or passively) with those who did not apply the diagnosis when presented with a clinical description of this disorder.

The views measured were about:

- a) Causal beliefs
- b) Possibility of recovery
- c) Usefulness of psychological treatments
- d) Usefulness of pharmacological treatments
- e) Need of long-term pharmacological treatments
- f) Reliability of PWS in reporting health problems to clinicians
- g) Insight of PWS into their own condition
- h) Discriminatory treatments of PWS in non-psychiatric hospital wards
- i) Perception of dangerousness of PWS
- j) Perception of social distance from PWS
- k) Perceived PWS' difficulties in romantic relationships

We hypothesized that GPs who expressed their views of schizophrenia after identifying this disorder in a clinical description (Active Schizophrenia Diagnosis - ASD) and GPs who expressed their views with reference to a pre-assigned diagnostic label "schizophrenia" and without being provided with a clinical description of this disorder (Passive Schizophrenia Diagnosis – PSD) would place more relevance on biogenetic factors and have more negative attitudes towards PWS than GPs who were not able to identify schizophrenia in the clinical description (Non Schizophrenia Diagnosis - NSD). We also expected that ASD and PSD would not significantly differ from each other.

Materials and Methods

Study design

The study was carried out on a randomly selected sample of 50% of the 860 registered GPs of the Naples central health district in the period June 2013 – March 2014. GPs were selected from the health district official GP lists, using SPSS random case selection command.

To differentiate the effect of active usage and passive acceptance of the schizophrenia diagnostic label, 215 GPs were randomly assigned to a group who was invited to read an undiagnosed ICD-10 clinical description of “schizophrenia” (reported in the Appendix), make a diagnosis and then complete the Opinions on mental illness Questionnaire (OQ) with reference to “people with a disorder like that reported in the description”. The remaining 215 GPs were assigned to a group who was asked to complete the same questionnaire just in relation to ‘PWS’, i.e., in this group GPs were not provided with a clinical description, but the diagnosis “schizophrenia” was given in the questionnaire. Analyses compared views of GPs who actively made a diagnosis of schizophrenia after reading the clinical description of this disorder (Active Schizophrenia Diagnosis – ASD), GPs who did not do so for the same clinical description (No Schizophrenia Diagnosis - NSD), and GPs who responded to the pre-assigned diagnostic label schizophrenia, only (without being provided with a clinical description of this disorder; Passive Schizophrenia Diagnosis – PSD).

Each GP was contacted personally or by phone by a researcher (A.S., R.P., or R.A.) and asked for his/her informed consent to take part in the study. GPs who agreed to participate either completed the self-reported questionnaire in the presence of the researcher at the GP’s medical office or by mail, according to their preference. During completions of the OQ, the researcher was available to provide GPs with explanations about the content of items, upon request. No pressure was put on the respondents. Information on GPs’ demographic variables, professional background and experience with persons having the disorder were also collected.

The study was approved by the Research Ethical Board of the Department of Psychology of the Campania University of Caserta, Italy (former denomination: Second University of Naples, Italy) and carried out in accordance with the Helsinki Declaration for experiments involving humans.

Assessment instrument

The OQ (Magliano, Fiorillo, De Rosa, Malangone, & Maj, 2004a) is a self-report tool exploring beliefs about the bio-psycho-social factors involved in the development of schizophrenia, and the treatments, prognosis and psychosocial consequences of this mental health problem. The tool, initially developed and validated in

samples of relatives of PWS (Magliano et al., 1999), was subsequently modified and re-validated with 279 persons diagnosed with this disorder (Magliano et al., 2009). Recently, the instrument has been further modified to be applied in health contexts (Magliano et al., 2014), and by the inclusion of items selected on the basis of the research literatures (Varese et al., 2012). The most recent version of the tool included: a) 16 yes/no items exploring factors involved in the development of schizophrenia; b) 4 yes/no items about which professionals should be involved in the treatment of people with this disorder; c) 26 items on views about treatments, prognosis, and psychosocial consequences of the disorder, rated on a 3-point scale from 1= “not true” to 3= “completely true, and grouped as follows: 1) possibility of recovery; 2) usefulness of pharmacological treatments; 3) usefulness of psychological therapies; 4) need of long-term pharmacological therapies; 5) insight of PWS; 6) perception of social distance from PWS; 7) dangerousness; 8) treatments of PWS in non-psychiatric hospital wards; 9) reliability of PWS in reporting their health condition to medical doctors; 10) difficulties of PWS in having romantic relationships.

The psychometric properties of the above mentioned version of the OQ (section c) have been previously investigated in terms of content validity (Magliano et al., 2014; Magliano et al., 2016). In this study sample, the psychometric properties of OQ section c have been further examined in terms of content and construct validity, by means of Cronbach’s alpha coefficient and Confirmatory Factor Analysis (CFA) (see Statistical Analyses and Results sections, and Table 3).

Statistical analyses

Chi squares (χ^2) were performed to compare the ASD, NSD and PSD groups in terms of factors involved in the development of schizophrenia (OQ section a), and views about which professionals should be involved in the care of PWS (OQ section b). Confirmatory Factor Analysis (CFA) was performed on OQ section c items to verify construct validity by applying maximum likelihood estimation of the covariances, in the LISREL 8 Program, (Jöreskog & Sörbom, 1996). Cronbach’s alpha values were computed to explore the content validity of factors. Multivariate Analysis of Variance (MANOVA) was used to compare the mean scores of factors 1 to 10 (OQ section c - dependent variables) among the three GP groups (ASD, NSD and PSD - independent variables). Post-hoc adjustment for multiple comparisons were performed by Bonferroni tests (ASD vs. NSD; ASD vs. PSD; NSD vs. PSD). The statistical significance level was set at $p < 0.05$. Chi squares (χ^2) and MANOVA were performed using the SPSS package, version 21.

Results

Descriptive results on the global sample

Of the 430 contacted GPs, 43 (10%) declined to participate (reasons: not interested 62%, no time 12%, personal reasons 12%, unknown 14%), leaving a sample of 387 participants. The 387 GPs were mainly male (312, 80.6%), and married (341, 88.6). Their mean age was 58.3 ± 5.2 years. The majority (373, 96.4%) had achieved a MD degree more than 20 years previously and had a post graduate medical training (283, 73.1%). Three-hundred and fifteen (81.4%) GPs stated they had patients with schizophrenia. Of the 387 participants, 17 (4.4%) requested explanations from the researcher regarding the content of items (maximum of ten items), while 370 (95.6%) filled it out without asking any questions.

One-hundred and ninety-five GPs completed the questionnaire in relation to just the given diagnostic label “schizophrenia” (PSD), and 192 filled in the questionnaire after reading the clinical description of schizophrenia and making a diagnosis. Of this latter group, 127 respondents (66.1%) diagnosed the clinical description as “schizophrenia” (ASD), and 65 (33.9%) did not (NSD). Of these 65, 49 (75.4%) diagnosed “depression” (alone or with anxiety and/or other mental illness and/or nervous breakdown), 11 (16.9%) reported “a mental illness”, 4 (6.1%) indicated “a nervous breakdown”, and 1 (1.5%) reported “don’t know”. Of the 65 GPs who did not diagnose schizophrenia in the clinical description, 55 (84.6%) were male, 59 (90.8%) were married. Their mean age was 58.8 ± 4.7 years. The majority (64, 98.5%) had achieved a MD degree more than 20 years previously and had a post graduate medical training (44, 67.7%). Fifty-nine (90.8%) GPs stated they had clients with a disorder like that reported in the description. The 65 NSD GPs did not differ significantly from the ASD GPs in the socio-demographic and professional background variables reported above, except for the percentages of GPs reporting to have patients with the disorder (76.4% vs. 90.8%, $\chi^2=5.8$, $df1$, $p<0.02$).

In the total sample, the factors most frequently reported as involved in the development of schizophrenia were heredity (78.0%), use of street drugs (51.2%) and chemical imbalance (50.4%; Table 1). However, 81.4% of respondents endorsed at least one psychosocial factor among the causes of the mental health problem (most frequently psychological violence - 43.4%, and traumatic events - 38.2%). Ninety-three percent of GPs recommended the psychiatrist as an appropriate treating professional, and 48.6% recommended the psychologist. Moreover, 33.3% recommended the GP and 14.5% the neurologist.

In the total sample, 26.6% of GPs thought it was ‘completely true’ that PWS could recover, and 37.9% were equally sure that people with this problem should take drugs for life (Table 2). Thirty-eight percent of GPs were fully

convinced that PWS are kept at distance by others, and 24.1% firmly believed that these persons are dangerous to others. Moreover, 28.3% of GPs firmly believed that people with this problem should be supervised in hospital wards.

Confirmatory Factor Analysis performed on the 26 items initially included in OQ section c confirmed the 10-group structure listed above, with the exclusion of three items. The details of the CFA are presented in Table 3. The final model fit the data well, with all factor loadings significant at the $p < 0.001$ level. Cronbach's alpha values of section c factors, ranging from .66 to .84, are reported in Table 3.

Differences in views of schizophrenia among ASD, PSD, and NSD groups

The factors most frequently reported as involved in the development of schizophrenia differed by group. In particular, heredity, chemical imbalance and misuse of street drugs were the factors most frequently endorsed by both the ASD and the PSD groups, and stress, work difficulties and family conflicts were the factors most frequently endorsed by the NSD group (Table 1). The percentage of GPs who endorsed heredity was significantly higher in the ASD and in the PSD groups than in the NSD group ($\chi^2 = 61.66$, $df 2$, $p < 0.0001$). Compared to ASD and to PSD, a higher percentage of GPs in the NSD group endorsed the following psychosocial factors: stress ($\chi^2 = 45.23$, $df 2$, $p < 0.0001$), family conflicts ($\chi^2 = 25.72$, $df 2$, $p < 0.0001$), disillusionment in love ($\chi^2 = 24.50$, $df 2$, $p < 0.0001$), work difficulties ($\chi^2 = 46.66$, $df 2$, $p < 0.0001$), bereavements ($\chi^2 = 33.60$, $df 2$, $p < 0.0001$), and physical illness ($\chi^2 = 21.92$, $df 2$, $p < 0.0001$).

In each group, 'psychiatrist' was the profession most frequently recommended for treatment (range: 72.3% - 97.6%), followed by 'psychologist' (44.6% - 64.6%), 'GP' (31.3%-43.1%), and 'neurologist' (11.8% -16.4%). In the NSD group, a higher percentage of respondents did *not* recommend psychiatrist than in the ASD and in the PSD groups (27.7% vs. 2.4% vs. 3.1%, $\chi^2 = 51.7$, $df 2$, $p < 0.0001$).

Multivariate analysis of variance, performed on OQ factors 1 to 10, revealed a significant effect of the groups on six of the factors (Table 4). Bonferroni post-hoc comparisons revealed that GPs in ASD and PSD groups did not significantly differ from each other in their views of schizophrenia. Bonferroni post-hoc analysis showed that GPs in the NSD group were more optimistic about the possibility of recovery compared to GPs in the ASD group and in the PSD group. Post-hoc analysis also revealed that GPs in the NSD group was less convinced of the usefulness of drug treatments and the need for long-term pharmacological treatments compared to GPs in the ASD and to those in PSD groups. Finally, post-hoc analysis also showed that GPs in the NSD group had less restrictive views about how these persons should be treated in non-psychiatric hospital wards and perceived these persons as less dangerous, and as being kept at less social distance than GPs in the ASD group and GPs in PSD groups.

Discussion

Interpretation of the results

The results of this study show that GPs that actively attribute the diagnosis of “schizophrenia” to a clinical description differ from those who make other, or no, diagnoses and are similar to those who respond to the label “schizophrenia” when already provided. These findings suggest that the diagnosis “schizophrenia” is associated with a biological and pessimistic view regardless of whether it is used actively (i.e., diagnostic competence) or is just passively accepted.

Although the majority of GPs emphasised biogenetic factors among the causes of schizophrenia, they are aware of the role of psychosocial factors in the development of this disorder, as indicated by 81.4% mentioning at least one non-biological cause. However, a large minority of GPs do not seem fully aware of the effectiveness of non-pharmacological treatments (Mueser, Deavers, Penn, & Cassisi, 2013). Only 57.3% were completely convinced that psychological interventions are useful in the treatment of schizophrenia, and only 48.6% recommended a psychologist. These results might be related to greater exposure of GPs to pharmacological education of the kind provided by pharmaceutical companies and a limited focus on more integrated bio-psychological care in medical curricula (Astin, Sierpina, Forys, & Clarridge, 2008) and Continuous Medical Education programs.

In the ASD and PSD groups, GPs more frequently reported heredity among the causes, were more pessimistic about recovery, and were more convinced of the usefulness and need of long-term pharmacological treatments for schizophrenia. These results are in line with previous findings on the relationships between the diagnosis of schizophrenia and adoption of a biogenetic causal model (Read et al., 2013), and between labelling, biogenetic explanations and views of schizophrenia as an incurable illness, requiring pharmacological treatments with a focus on control and containment (Kvaale et al., 2013).

In the total sample, only 26.6% of GPs were completely convinced that PWS could recover. The GPs' pessimism about prognosis could be in part related to the ambiguous meaning of the term “recovery” (Ng, Pearson, Chen, & Law, 2011). Some GPs may view it as implying being symptom-free and without need of further treatment, while others may take it to mean living a meaningful life, even with some symptom continuation and occasional support from mental health services (Bellack, 2006). However, this level of skepticism about the “possibility” of recovery, however it is defined, is of concern. It may negatively influence the information and hope that GPs convey to their clients, and it may discourage PWS themselves from making efforts to improve their lives.

Compared to the NSD group, the ASD and PSD groups perceived PWS as more dangerous, as kept at higher social distance by others and as needing to be treated differently in non-psychiatric hospital wards. These results

support previous findings on the toxic effect of the diagnostic label of “schizophrenia” on perceptions of dangerousness (Read et al., 2013). Some authors explain this association as consequent of viewing people with this mental health problem as incapable of controlling their aggressive behaviors, since these behaviors are due to chemical imbalance and/or by genetic dysfunctions (Kvaale et al., 2013).

Regarding the 65 GPs that did not identify “schizophrenia” from the clinical description (NSD), it is possible that these GPs lack knowledge about schizophrenia or mental health issues in general. It should also be considered that in the NSD group, 75.4% of GPs diagnosed depression. Therefore, it cannot be excluded that the relevance to psychological causal explanations, the more optimistic views of prognosis and treatments, and the lower level of prejudices found in this group might reflect their attitudes towards people with depression. Moreover, NSD GPs recommended less frequently the psychiatrist, and did not recommended any other professional more frequently. This situation may lead to an underestimation of clients’ needs for mental health care and to a delay in the provision of appropriate treatments. Therefore, it is possible that GPs who were not able to identify schizophrenia in the description are in need of more training or education on mental health problems. We did not find significant differences among the three groups in beliefs about whether PWS are capable of reporting health problems to doctors, or have insights into their own conditions. However, only 24.3% of the total sample viewed these persons as reliable in reporting their physical problems and 19.6% in reporting their mental health problems. GPs’ skepticism toward reliability and insight of people with psychosis may discourage clients themselves from help-seeking, with further negative effects on their health.

Although 81.4% of participants stated they had clients with the mental health problem, only 31.3% to 43.1% recommended the GP among the treating professionals. These results suggest that GPs are not particularly willing to take care of persons with severe mental health problems, and/or that they feel insufficiently skilled to work with these clients.

The results of this study highlight that there may be a need to provide some GPs with training on clinical features of schizophrenia and education about stigma and its effects on health (Ucok et al., 2006). Based on the findings of this study, we are planning educational initiatives to provide GPs with information on the experience of psychosis, actual rates of recovery, risks of dangerous behaviours, and effectiveness of both drug and psychological treatments for this problem and to sensitise them to stigma. These initiatives are partly based on testimonies of individuals who have recovered or are living successfully with symptoms of psychosis, which have been found to be effective for improving attitudes toward PWS among trainee medical doctors and psychologists (Magliano et al., 2014). Moreover, in order to support a more optimistic and evidence-based view of prognosis among health professionals, efforts are needed to make available integrated bio-psycho-social interventions in mental health services for all PWS who may benefit. We hope

that such strategies will help to improve knowledge of GPs about psychosis, and increase GPs' attitudes towards PWS, and thereby increase the probability that these persons will receive the same attention for their health problems, and same quality of primary care, as other citizens.

Strengths and limitations of the study

This is the first study carried out in Italy that has specifically explored GPs' views of schizophrenia and whether they varied in relation to GPs' ability of making this diagnosis and diagnostic label *per se*. Among the strengths of the study are the inclusion of a relatively large and randomly selected sample, the use of control groups, the face-to-face data collection, and the high participation rate (90%). The use of a self-reported questionnaire whose psychometric properties have been found to be satisfactory is an additional strength, also facilitating its replication in other health care contexts. The study also, however, has a number of limitations suggesting caution in the interpretation of its results: a) a mean age of 58, so the results may be not representative of younger GPs; b) the inclusion of GPs from only one metropolitan area located in southern Italy, a geographical area where healthcare resources are poorer (Magliano et al., 2002) and public prejudices towards PWS are higher than in other areas of the country (Magliano et al., 2004b); c) the focus only on beliefs regarding schizophrenia, one of the most stigmatised of mental health problems worldwide (Pescosolido, Medina, Martin, & Long, 2013) so its findings cannot be generalised to other mental disorders whose familiarity and acceptance by health professionals is higher (Lawrie et al., 1998; Schomerus, Matschinger, & Angermeyer, 2013); d) the survey investigated only the *opinions* of GPs, and may not reflect GPs' actual behaviours with PWS in clinical practice; e) the cross-sectional design of the study does not permit inferences regarding the effects of labelling on GPs' views over time.

Acknowledgments

The authors thank the 387 GPs for giving us their time.

Conflict of interest

None.

Grant

This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

REFERENCES

- Adewuya, A.O., & Oguntade, A.A. (2007). Doctors' attitude towards people with mental illness in Western Nigeria. *Social Psychiatry and Psychiatric Epidemiology*, 42, 931-936.
- Ahn, W.K., Proctor, C.C., & Flanagan, E.H. (2009). Mental Health Clinicians' Beliefs About the Biological, Psychological, and Environmental Bases of Mental Disorders. *Cognitive Science*, 33, 147-182.
- Astin, J.A., Sierpina, V.S., Forys, K., & Clarridge, B. (2008). Integration of the biopsychosocial model: perspectives of medical students and residents. *Academic Medicine*, 83, 20-27.
- Bellack, A.S. (2006). Scientific and consumer models of recovery in schizophrenia: concordance, contrasts, and implications. *Schizophrenia Bulletin*, 32, 432-442.
- Buchanan, A., & Bhugra, D. (1992). Attitude of the medical profession to psychiatry. *Acta Psychiatrica Scandinavica*, 85, 1-5.
- Capasso, R.M., Lineberry, T.W., Bostwick, J.M., Decker, P.A., & Sauver, J.S. (2008). Mortality in schizophrenia and schizoaffective disorder: An Olmsted county, Minnesota cohort: 1950-2005. *Schizophrenia Research*, 98, 287-294.
- Carr, V.J., Lewin, T.J., Barnard, R.E., Walton, J.M., Allen, J.L., Constable, P.M., & Chapman, J.L. (2004). Attitudes and roles of general practitioners in the treatment of schizophrenia compared with community mental health staff and patients. *Social Psychiatry and Psychiatric Epidemiology*, 39, 78-84.
- Corrigan, P.W., Mittal, D., Reaves, C.M., Haynes, T.F., Han, X., Morris, S., & Sullivan, G. (2014). Mental health stigma and primary health care decisions. *Psychiatry Research*, 218, 35-38.
- De Hert, M., Cohen, D., Bobes, J., Cetkovich-Bakmas, M., Leucht, S., Ndeti, D.M., ... Correll, C.U. (2011). Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, plus recommendations at the system and individual level. *World Psychiatry*, 10, 138-151.
- Goldney, R.D., & Bottrill, A. (1980). Attitudes to patients who attempt suicide. *Medical Journal of Australia*, 2, 717-720.
- Harangozo, J., Reneses, B., Brohan, E., Sebes, J., Csukly, G., Lopez-Ibor, J.J., ... Thornicroft, G. (2014). Stigma and discrimination against people with schizophrenia related to medical services. *International Journal of Social Psychiatry*, 60, 359-366.
- Henderson, C., Noblett, J., Clement, S., Caffrey, A., Gale-Grant, O., Schulze, B., ... Thornicroft, G. (2014). Mental health-related stigma in health care and mental health-care settings. *Lancet Psychiatry*, 1, 467-482.
- Hetlevik, Ø., Solheim, M., & Gjesdal, S. (2015). Use of GP services by patients with schizophrenia: a national cross-sectional register-based study. *BMC Health Services Research*, 15, 66.

- Howard, L.M., Barley, E.A., Davies, E., Rigg, A., Lempp, H., Rose, D., ... Thornicroft, G. (2010). Cancer diagnosis in people with severe mental illness: practical and ethical issues. *Lancet Oncology*, *11*, 797-804.
- Imhoff, R. (2016). Zeroing in on the Effect of the Schizophrenia Label on Stigmatizing Attitudes: A Large-scale Study. *Schizophrenia Bulletin*, *42*, 456-463.
- Irfan, M., Caldas de Almeida, J.M., Irfan, U.M., Raza, U.A., & Farooq, S. (2015). Schizophrenia diagnosis and treatment by general practitioners: A cross-sectional study in district Peshawar, Pakistan. *Journal of the Pakistan Medical Association*, *65*, 937-942.
- Jorm, A.F., Korten, A.E., Jacomb, P.A., Christensen, H., & Henderson, S. (1999). Attitudes towards people with a mental disorder: a survey of the Australian public and health professionals. *Australian and New Zealand Journal of Psychiatry*, *33*, 77-83.
- Jöreskog, K.G., & Sörbom, D. (1996). LISREL 8: User's Reference Guide. Scientific Software International.
- Kvaale, E.P., Gottdiener, W.H., & Haslam, N. (2013). Biogenetic explanations and stigma: a meta-analytic review of associations among laypeople. *Social Science & Medicine*, *96*, 95-103.
- Lam, T.P., Lam, K.F., Lam, E.W., & Ku, Y.S. (2013). Attitudes of primary care physicians towards patients with mental illness in Hong Kong. *Asia-Pacific Psychiatry*, *5*, E19-28.
- Laursen, T.M., Munk-Olsen, T., & Gasse, C. (2011). Chronic somatic comorbidity and excess mortality due to natural causes in persons with schizophrenia or bipolar affective disorder. *PLoS One*, *6*, e24597.
- Lawrie, S.M., Martin, K., McNeill, G., Drife, J., Chrystie, P., Reid, A., Wu, P., Nammery, S., & Ball, J. (1998). General practitioners' attitudes to psychiatric and medical illness. *Psychological Medicine*, *28*, 1463-1467.
- Lawrie, S.M., Parsons, C., Patrick, J., Masson, S., Sussmann, J., Cumming, D., ...Pickup, S. (1996). A controlled trial of general practitioners' attitudes to patients with schizophrenia. *Health Bulletin*, *54*, 201-203.
- Leucht, S., Burkard, T., Henderson, J., Maj, M., & Sartorius, N. (2007). Physical illness and schizophrenia: a review of the literature. *Acta Psychiatrica Scandinavica*, *116*, 317-333.
- Liggins, J., & Hatcher, S. (2005). Stigma toward the mentally ill in the general hospital: a qualitative study. *General Hospital Psychiatry*, *27*, 359-364.
- Magliano, L., De Rosa, C., Fiorillo, A., Malangone, C., Guarneri, M., Marasco, C., ...Working Group (2004b). Beliefs of psychiatric nurses about schizophrenia: a comparison with patients' relatives and psychiatrists. *International Journal of Social Psychiatry*, *50*, 319-330.

- Magliano, L., Fiorillo, A., De Rosa, C., Malangone, C., & Maj, M. (2004a). Beliefs about schizophrenia in Italy: a comparative nationwide survey of the general public, mental health professionals, and patients' relatives. *Canadian Journal of Psychiatry*, *49*, 322-330.
- Magliano, L., Fiorillo, A., Del Vecchio, H., Malangone, C., De Rosa, C., Bachelet, C., ...Maj, M. (2009). Development and validation of a self-reported questionnaire on users' opinions about schizophrenia: a participatory research. *International Journal of Social Psychiatry*, *55*, 425-441.
- Magliano, L., Marasco, C., Fiorillo, A., Malangone, C., Guarneri, M., Maj, M., & Working Group (2002). The impact of professional and social network support on the burden of families of patients with schizophrenia in Italy. *Acta Psychiatrica Scandinavica*, *106*, 291-298.
- Magliano, L., Marasco, C., Guarneri, M., Malangone, C., Lacrimini, G., Zanus, P., & Maj, M. (1999). A new questionnaire assessing the opinions of the relatives of patients with schizophrenia on the causes and social consequences of the disorder: reliability and validity. *European Psychiatry*, *14*, 71-75.
- Magliano, L., Read, J., Rega, S., Oliviero, N., Sagliocchi, A., Patalano, M., & D'Ambrosio, A. (2011). The influence of causal explanations and diagnostic labeling on medical students' views of schizophrenia. *Academic Medicine*, *86*, 1155-1162.
- Magliano, L., Read, J., Sagliocchi, A., Oliviero, N., D'Ambrosio, A., Campitiello, ...Patalano, M. (2014). "Social dangerousness and incurability in schizophrenia": results of an educational intervention for medical and psychology students. *Psychiatry Research*, *219*, 457-463.
- Magliano, L., Read, J., Rinaldi, A., Costanzo, R., De Leo, R., Schioppa, G., & Petrillo, M (2016). The Influence of Causal Explanations and Diagnostic Labeling on Psychology Students' Beliefs About Treatments, Prognosis, Dangerousness and Unpredictability in Schizophrenia. *Community Mental Health Journal* *52*, 361-369.
- Mittal, D., Corrigan, P., Sherman, M.D., Chekuri, L., Han, X., Reaves, C., ...Sullivan, G. (2014). Healthcare providers' attitudes toward persons with schizophrenia. *Psychiatric Rehabilitation Journal*, *37*, 297-303.
- Mittal, D., Ounpraseuth, S.T., Reaves, C., Chekuri, L., Han, X., Corrigan, P., & Sullivan, G. (2016). Providers' Personal and Professional Contact With Persons With Mental Illness: Relationship to Clinical Expectations. *Psychiatric Services*, *67*, 55-61.
- Morgan, A.J., Reavley, N.J., & Jorm, A.F. (2014). Beliefs about mental disorder treatment and prognosis: comparison of health professionals with the Australian public. *Australian and New Zealand Journal of Psychiatry*, *48*, 442-451.

- Mueser, K.T., Deavers, F., Penn, D.L., & Cassisi, J.E. (2013). Psychosocial treatments for schizophrenia. *Annals of Clinical Psychology Review, 9*, 465-97.
- Ng, R.M., Pearson, V., Chen, E.E., & Law, C.W. (2011). What does recovery from schizophrenia mean? Perceptions of medical students and trainee psychiatrists. *International Journal of Social Psychiatry, 57*, 248-262.
- Oud, M.J.T., Schuling, J., Groenier, K.H., Verhaak, P.F.M., Slooff, C.J., Dekker, J.H., & Meyboom-de Jong, B. (2010). Care provided by general practitioners to patients with psychotic disorders: a cohort study. *BMC Family Practice, 11*, 92.
- Parker, G., Lee, C., Chen, H., Kua, J., Loh, J., & Jorm, A. (2001). Mental health literacy study of general practitioners: a comparative study in Singapore and Australia. *Australasian Psychiatry, 9*, 55-59.
- Pescosolido, B.A., Medina, T.R., Martin, J.K., & Long, J.S. (2013). The "backbone" of stigma: identifying the global core of public prejudice associated with mental illness. *American Journal of Public Health, 103*, 853-860.
- Phelan, J.C., Yang, L.H., & Cruz-Rojas, R. (2006). Effects of attributing serious mental illnesses to genetic causes on orientations to treatment. *Psychiatric Services, 57*, 382-387.
- Read, J., Haslam, N., & Magliano, L. (2013). Prejudice, stigma, and "schizophrenia": the role of bio-genetic ideology. In J. Read & J. Dillon (Eds.), *Models of Madness* (pp. 157-177.) London: Routledge.
- Reavley, N.J., Mackinnon, A.J., Morgan, A.J., & Jorm, A.F. (2014). Stigmatising attitudes towards people with mental disorders: a comparison of Australian health professionals with the general community. *Australian and New Zealand Journal of Psychiatry, 48*, 433-441.
- Roberts, L., Roalfe, A., Wilson, S., & Lester, H. (2007). Physical health care of patients with schizophrenia in primary care: a comparative study. *Family Practice, 24*, 34-40.
- Saha, S., Chant, D., & McGrath, J. (2007). A systematic review of mortality in schizophrenia: is the differential mortality gap worsening over time? *Archives of General Psychiatry, 64*, 1123-1131.
- Schomerus, G., Matschinger, H., & Angermeyer, M.C. (2013). Continuum beliefs and stigmatizing attitudes towards persons with schizophrenia, depression and alcohol dependence. *Psychiatry Research, 209*, 665-669.
- Shefer, G., Henderson, C., Howard, L.M., Murray, J., & Thornicroft, G. (2014). Diagnostic overshadowing and other challenges involved in the diagnostic process of patients with mental illness who present in emergency departments with physical symptoms--a qualitative study. *PLoS One, 9*, e111682.

- Simon, A.E., Lauber, C., Ludewig, K., Braun-Scharm, H., Umbricht, D.S., & Swiss Early Psychosis Project (2005). General practitioners and schizophrenia: results from a Swiss survey. *British Journal of Psychiatry*, *187*, 274-281.
- Solar, A. (2002). Factors contributing to difficulty with psychiatric disorder among junior medical staff. *Australian Psychiatry*, *10*, 279-282.
- Sullivan, G., Mittal, D., Reaves, C.M., Haynes, T.F., Han, X., Mukherjee, S., ...Corrigan, P.W. (2015). Influence of schizophrenia diagnosis on providers' practice decisions. *Journal of Clinical Psychiatry*, *76*, 1068-74.
- Thornicroft, G., Brohanm, E., Rose, D., Sartorius, N., Leese, M., & INDIGO Study Group (2009). Global pattern of experienced and anticipated discrimination against people with schizophrenia: a cross-sectional survey. *Lancet*, *373*, 408-415.
- Thornicroft, G., Rose, D., & Kassam, A. (2007). Discrimination in health care against people with mental illness. *International Review of Psychiatry*, *19*, 113-122.
- Ucock, A., Soygur, H., Atakli, C., Kuscu, K., Sartorius, N., Duman, Z.C., ... Erkoc, S. (2006). The impact of antistigma education on the attitudes of general practitioners regarding schizophrenia. *Psychiatry and Clinical Neuroscience*, *60*, 439-443.
- Vancampfort, D., Stubbs, B., Mitchell, A.J., De Hert, M., Wampers, M., Ward, P.B., ... Correll, C.U. (2015). Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. *World Psychiatry* *14*, 339-347.
- Varese, F., Smeets, F., Drukker, M., Lieveise, R., Lataster, T., Viechtbauer, W., ...Bentall, R.P. (2012). Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective- and cross-sectional cohort studies. *Schizophrenia Bulletin*, *38*, 661-671.

Appendix (clinical description provided only to 50% of selected GPs, those who were asked to complete the questionnaire in reference to “*people with a condition like that reported in the clinical description*” and to make a diagnosis)

Some people sometimes seem unable to distinguish between things that really happen and are experienced by other people, and things that happen only in their mind. Sometimes, these people believe or say things that seem bizarre or absurd to other people, or hear voices, smell things, or see images that other people do not. Sometimes, these people may have difficulty expressing their feelings or behaving appropriately (for instance, they may cry in response to a positive event, or may appear happy following an unpleasant one), or they may remain shut up in their house for a long time, or talk very little or not at all. They behave as if they lived in a world of their own, apparently without interest in anything or anybody. Sometimes they may have muddled thoughts, may invent odd or incomprehensible words, may lose the thread of the speech, or they may jump from one issue to another with no apparent reason.

Table 1. GP' beliefs about the factors involved in the development of schizophrenia in the three groups and in total sample (N=387).

Causes	GP groups							
	NSD (N=65)		ASD (N=127)		PSD (N=195)		Total sample (N=387)	
	N	%	N	%	N	%	N	%
Heredity*	27	41.5	112	88.2	163	83.6	302	78.0
Chemical imbalance	26	40.0	67	52.8	102	52.3	195	50.4
Use of street drugs	28	43.1	75	59.1	95	48.7	198	51.2
Psychological violence	31	47.7	53	41.7	84	43.1	168	43.4
Use of alcohol	30	46.2	53	41.7	70	35.9	153	39.5
Traumatic events	31	47.7	50	39.4	67	34.4	148	38.2
Stress*	46	70.8	30	23.6	60	30.8	136	35.1
Physical violence	25	38.5	28	22.0	54	27.7	107	27.6
Sexual abuses	25	38.5	30	23.6	54	27.7	109	28.2
Family conflicts*	36	55.4	27	21.3	52	26.7	115	29.7
Poor parenthood	17	26.2	29	22.8	47	24.1	93	24.0
Bereavements*	33	50.8	25	19.7	32	16.4	90	23.3
Physical illness*	18	27.7	11	8.7	14	7.2	43	11.1
Work difficulties*	34	52.3	17	13.4	30	15.4	81	20.9
Disillusionment in love*	26	40.0	17	13.4	28	14.4	71	18.7
Illness in pregnancy	14	21.5	17	13.4	26	13.3	57	14.7

NSD: No Schizophrenia Diagnosis - those in the group that were asked to make a diagnosis but did not respond with "schizophrenia"; ASD: Active Schizophrenia Diagnosis- those in the group that were asked to make a diagnosis and responded with "schizophrenia" PSD: Passive Schizophrenia Diagnosis - those in the group who were given the diagnosis; *p<0.0001.

Table 2. GPs views of schizophrenia in total sample (N=387).

OQ items	GPs answers					
	“Not true”		“Partially true”		“Completely true”	
	N	%	N	%	N	%
§ can recover	42	11.5	226	61.9	97	26.6
Drugs are useful for §	6	1.6	133	34.5	247	64.0
Psychological interventions are useful for §	13	3.4	150	39.3	219	57.3
§ must take drugs over the life	66	18.1	160	44.0	138	37.9
If stop taking drugs, § become dangerous	94	26.0	190	52.6	77	21.3
If stop taking drugs, § become unwell again	37	9.9	188	50.4	148	39.7
§ do not realize that they are ill	42	11.2	211	56.1	123	32.7
§ do not realize when they become unwell	47	12.4	178	47.1	153	40.5
§ are unpredictable	43	11.5	186	49.9	144	38.6
§ are kept at distance by the others	55	14.6	179	47.6	142	37.8
People do not know how to behave with §	19	5.0	151	39.7	210	55.3
People do not understand the difficulties experienced by §	10	2.6	132	34.6	240	62.8
People are frightened by §	23	6.1	116	30.5	241	63.4
§are dangerous to themselves	44	11.8	225	60.2	105	28.1
§are dangerous to others	47	12.7	239	63.4	91	24.1
In a non-psychiatric hospital ward, §create discomfort to other patients	76	20.9	192	52.9	95	26.2
In a non-psychiatric hospital ward, §should be separated from other patients	173	49.0	123	34.0	57	16.1
When § are admitted to non-psychiatric wards, psychiatric advice should always be requested	20	5.2	87	22.8	274	71.9
In non-psychiatric hospital wards, §should be supervised (for instance, by additional nurse)	104	29.5	149	42.2	100	28.3
§ are reliable in referring their mental problems to medical doctors	68	18.3	231	62.1	73	19.6
§ are reliable in referring their physical problems to medical doctors	56	14.9	228	60.8	91	24.3
It is difficult for § to have a love relationship	83	24.6	162	48.1	92	27.3
It is difficult for § to get married or to live together with a partner	64	20.1	172	50.0	103	29.9

§ = Persons with a condition like that reported in the clinical description or PWS

Table 3. Confirmatory Factor Analysis on the QO section c items (N=387).

QO section c items	Factor loadings									
	1	2	3	4	5	6	7	8	9	10
§ can recover	0.58									
Drugs are useful for §		0.52								
Psychological interventions are useful for §			0.56							
§ must take drugs over the life				0.44						
If stop taking drugs, § become dangerous				0.53						
If stop taking drugs, § become unwell again				0.46						
§ do not realize that they are ill					0.41					
§ do not realize when they become unwell					0.49					
§ are unpredictable						0.28				
§ are kept at distance by the others						0.38				
People do not know how to behave with §						0.46				
People do not understand the difficulties experienced by §						0.38				
People are frightened by §						0.41				
§are dangerous to themselves							0.47			
§are dangerous to others							0.54			
In a non-psychiatric hospital ward, §create discomfort to other patients								0.57		
In a non-psychiatric hospital ward, §should be separated from other patients								0.50		
When § are admitted to non-psychiatric wards, psychiatric advice should always be requested								0.23		
In non-psychiatric hospital wards, §should be supervised (for instance, by additional nurse)							0.42			
§ are reliable in referring their mental problems to medical doctors									0.54	
§ are reliable in referring their physical problems to medical doctors									0.42	
It is difficult for § to have a love relationship										0.57
It is difficult for § to get married or to live together with a partner										0.54
Cronbach's alpha value	-	-	-	0.76	0.66	0.75	0.84	0.74	0.77	0.81

§ persons with a condition like that reported in the description or PWS; Factor 1: possibility to recover; 2: usefulness of pharmacological treatments; 3: usefulness of psychological therapies; 4: need of long-term pharmacological therapies; 5: insight of PWS; 6: perception of social distance from PWS; 7: perception of dangerousness; 8: treatments of PWS in non-psychiatric hospital wards; 9: reliability of PWS in reporting their health condition to medical doctors; 10: difficulties of PWS in having romantic relationships. Maximum likelihood estimation of the covariances. Fit indexes: $\chi^2 = 320.35$, df 188, N= 387, $p < 0.05$; NNFI=0.95; CFI=0.97; RMSEA=0.04(0.03; 0.05); SRMR=0.04. All factor loadings are statistically significant at $p < 0.001$. The correlations among the ten factors were all significant for $p < .05$, except those between factor 1 with 2, 5, 6 and 9; between factor 2 and 5, 7, 9, and 10; between factor 3 and 5, 6, 7, 8, 9, 10; between factor 5 and 10 (standardized solution).

Table 4. Comparisons of GPs views of schizophrenia in the three groups.

OQ factors	GPs groups						MANOVA F (1,314) ^a
	NSD		ASD		PSD		
	Mean	SE	Mean	SE	Mean	SE	
1 Possibility to recover in §	2.47 ^a	0.08	2.08 ^b	0.06	2.11 ^b	0.05	9.7*
2 Usefulness of pharmacological treatments	2.32 ^b	0.07	2.66 ^a	0.05	2.68 ^a	0.04	11.5*
3 Usefulness of psychological therapies	2.61	0.07	2.52	0.06	2.50	0.05	0.8
4 Needs of long-term pharmacological therapies	1.77 ^b	0.07	2.16 ^a	0.05	2.29 ^a	0.04	18.8*
5 Insight of §	2.29	0.08	2.32	0.06	2.18	0.05	2.1
6 Perception of social distance from §	2.21 ^b	0.06	2.45 ^a	0.04	2.49 ^a	0.03	8.5*
7 Perception of dangerousness of §	1.88 ^b	0.07	2.22 ^a	0.05	2.18 ^a	0.04	7.8*
8 Treatments of § in non-psychiatric hospital wards	1.88 ^b	0.07	2.10 ^a	0.05	2.17 ^a	0.04	6.7*
9 Reliability of § in reporting health problems to medical doctors	2.21	0.07	2.09	0.05	2.04	0.04	2.0
10 Difficulties of § in having romantic relationships	1.95	0.09	2.09	0.06	2.07	0.05	0.9

NSD: No Schizophrenia Diagnosis - those in the group that were asked to make a diagnosis but did not respond with “schizophrenia”; ASD: Active Schizophrenia Diagnosis - those in the group that were asked to make a diagnosis and responded with “schizophrenia”; PSD: Passive Schizophrenia Diagnosis - those in the group who were given the diagnosis; Multivariate Analysis of Variance (MANOVA): dependent variables = mean scores of 1- 10 QO factors; independent variables = NSD, ASD and PSD. MANOVA Wilks’ λ = .76, F (20,604) = 4.42, p < 0.0001; ^{a, b} univariate post-hoc analysis; estimated marginal means; adjustment for multiple comparisons: Bonferroni, a>b; * p < 0.001; § persons with a condition like that reported in the description or PWS.