Personality disorders in the community: results from the Australian National Survey of Mental Health and Wellbeing

Article *in* Social Psychiatry and Psychiatric Epidemiology · July 2002

DOI: 10.1007/s001270200017 · Source: PubMed

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ORIGINAL PAPER

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Personality disorders in the community: results from the Australian National Survey of Mental Health and Wellbeing

Part II. Relationships between personality disorder, Axis I mental disorders and physical conditions with disability and health consultations

Accepted: 13 January 2002

Abstract *Background* The aims of this study were threefold. First, to ascertain whether personality disorder (PD) was a significant predictor of disability (as measured in a variety of ways) over and above that contributed by Axis I mental disorders and physical conditions. Second, whether the number of PD diagnoses given to an individual resulted in increasing severity of disability, and third, whether PD was a significant predictor of health and mental health consultations with GPs, psychiatrists, and psychologists, respectively, over the last 12 months. *Method* Data were obtained from the National Survey of Mental Health and Wellbeing, conducted between May and August 1997. A stratified random sample of households was generated, from which all those aged 18 and over were considered potential interviewees. There were 10 641 respondents to the survey, and this represented a response rate of 78 %. Each interviewee was asked questions indexing specific ICD-10 PD criteria. *Results* Five measures of disability were examined. It was found that PD was a significant predictor of disability once Axis I and physical conditions were taken into account for four of the five disability measures. For three of the dichotomously-scored disability measures, odds ratios ranged from 1.88 to 6.32 for PD, whilst for the dimensionally-scored Mental Summary Subscale of the SF-12, a beta weight of –0.17 was recorded for PD. As regards number of PDs having a quasi-linear relationship to disability, there was some indication of this on the SF-12 Mental Summary Subscale and the two role functioning measures, and less so on the other two measures. As regards mental consultations, PD was a predictor of visits to GPs, psychiatrists and psychologists, over and above Axis I disorders and physical conditions. *Conclusion* The study reports findings from a nationwide survey conducted within Australia and as such the data are less influenced by the selection and setting bias inherent in other germane studies. However, it does support previous findings that PD is a significant predictor of disability and mental health consultations independent of Axis I disorders and physical conditions.

Key words personality disorders – physical disorders – mental disorders – epidemiological studies – community-dwelling individuals – mental health surveys

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Introduction

In our previous paper (Jackson and Burgess 2000), we reported on a national survey, the National Survey of Mental Health and Wellbeing (NSMHWB), conducted by the Australian Bureau of Statistics (ABS; 1998a, 1999). To our knowledge, this is the only survey that attempted to examine the complete range of PDs within a nation. The survey was conducted between May and August 1997. There were 10 641 respondents to the survey, with this representing a response rate of 78 %. Each interviewee was asked questions from the International Personality Disorder Examination (IPDE) ICD-10 Screener (Lor-

anger et al. 1997), with the 59 questions of the IPDE Screener indexing specific ICD-10 PD (WHO 1992) criteria. Using replicate weights, we estimated that approximately 6.5 % of the adult Australian population has one or more PDs (lifetime prevalence) (Jackson and Burgess 2000). Individuals with PD were more likely to be younger, male, and not married, and to have an anxiety disorder, an affective disorder, a substance use disorder, or a physical condition.

We also found that persons with one or more PDs had significantly lower scores on the dimensionally-rated SF-12 Physical Summary and SF-12 Mental Summary Subscales, indicating that those with PD were more disabled than those without PD (Jackson and Burgess 2000). However, we did not test whether this finding was influenced by comorbid physical conditions and Axis I mental disorders; it might be argued that it was their influence – not that of PD – that was responsible for the disability that was seemingly the product of having a PD.

Disability and other outcomes associated with PD have been examined in 'special' populations or individuals attending a variety of outpatient settings, or individuals attending community clinics – almost all use convenience samples. Four examples of such studies are as follows: Hueston et al. (1996) studied 93 patients from a public-supported family practice residency training clinic and found that 70 % had PDs and lower (i. e., poorer) scores on the disability measure than those without PD.

Johnson et al. (2000) focused on a study sample of 138 gay men (95 HIV+ and 43 HIV–). These participants completed various measures including a measure of global impairment together with measures of loneliness and social relationships. After controlling for HIV serostatus and Axis I disorders, the researchers found that participants with PDs reported less social support, more social conflict, more loneliness, and greater global impairment than did those without PD.

Nakao et al. (1992) examined the relationship of DSM-III-R (APA 1987) PDs to functional impairment as measured by the Global Assessment of Functioning (GAF; APA 1987) scale. Patients were 149 patients selected from an Osaka outpatient clinic and 136 of them had a principal Axis I disorder, notably mood or anxiety disorders. The authors found that patients with any PD were more impaired than those without PD. However, they did not use regression analyses, and acknowledged that GAF scores reflect both Axis I and II psychopathologies.

Andreoli et al. (1989) reported on 78 psychiatric patients who were all hospitalized. Thirty-five percent of patients met the criteria for PD. At 1-year follow-up, PD was significantly associated with poorer global outcome and social investments and at 2-year follow-up, with poorer interpersonal relationships.

However, as we noted previously (Jackson and Burgess 2000), such studies are limited by the nature of the samples and the range of Axis I conditions and Axis II PDs are likely to be limited in nature – more limited than might be found in the community at large. Of course, there may well be an unknown number of people in the community with PDs who have yet to seek psychiatric help; the type of PDs they possess may differ in kind from those possessed by the people who have sought help for health or mental health services (Jackson and Burgess 2000). Also, none of the studies we reviewed systematically examined for a range of physical conditions which may co-occur with both PDs and Axis I conditions and lead to disability in their own right. Obviously, a physical condition itself may lead a person to seek health and mental health consultations.

Therefore, the aims of the current study were threefold: first, to assess whether PD was a significant predictor of disability once comorbid physical conditions, Axis I mental disorders, and their various interactive effects were taken into account; second, whether increasing numbers of PDs were associated with increasing disability; and third, whether PD remained a significant predictor of health and mental health consultations once Axis I disorders, physical conditions, and their various interactions were taken into account in logistic regression models.

Subjects and method

Sample

This second report describes data obtained from the National Survey of Mental Health and Wellbeing (NSMHWB) conducted by the Australian Bureau of Statistics (ABS: 1998a, 1999) in 1997 and funded under the National Mental Health Strategy (NHMS). The survey involved the random selection of Australian households; the adult with the next birthday from each household was invited to participate. If he or she declined to participate, no further recruitment of that household was attempted. This procedure yielded 10 641 participants aged 18 years and over (and representing a 78 % response rate) for whom trained non-clinical interviewers collected self-report data in face-to-face interviews. The authors received data on a Confidential Unit Record File (CURF: ABS 1998b). Data from the NSMHWB included questions pertaining to PDs, Axis I diagnoses, disability and sociodemographics.

Instruments

The instruments used in this survey are described elsewhere and for more details the reader is referred to our previous paper (Jackson and Burgess 2000). However, here we briefly outline the instruments used in the study.

CIDI

The CIDI (WHO 1994) was used to identify the presence or absence of three classes of Axis I mental disorders during the previous 12 months. ICD-10 diagnostic criteria were expressed as symptom-based questions, thereby enabling the non-clinical interviewers to elicit information on the basis of which a scoring program could assign diagnoses. An individual could have an anxiety, affective, or substance abuse disorder. Panic disorder, agoraphobia, social phobia, generalized anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder are all examples of anxiety disorder. Depression, dysthymia, mania, hypomania, and bipolar disorder are all examples of affective disorder. Substance abuse disorders included harmful use/abuse and dependence. Each disorder was rated as present or absent for the purpose of this study.

Personality disorders

Personality disorders were measured in the National Survey by the 59-item International Personality Disorder Examination ICD-10 Screener (IPDE: Loranger et al. 1997). Each question assesses one of the criteria for each of the nine specific ICD-10 (WHO 1992) PDs (Loranger et al. 1997). The IPDE Screener was administered by the interviewer. The interviewer was instructed to "ask questions for each personality disorder until enough 5*s *('trues')* are coded for the respondent to meet criteria for that personality disorder or until there are not enough questions left to be asked for the respondent to meet criteria for that personality disorder" (WHO Collaborating Centre for Mental Health and Substance Abuse 1997, p. 86). The interviewee was required to respond 'true' or 'false' to a specified number of questions (each indexing an ICD-10 PD criterion) before they could be accorded a PD diagnosis. The nine specific PDs were as follows: paranoid, schizoid, dissocial, emotionally unstable-impulsive, emotionally unstable-borderline, histrionic, anankastic, anxious, and dependent. Specific examples of questions are to be found in Jackson and Burgess (2000) and Loranger et al. (1997). Details of the number of criteria needed to make each PD diagnosis are to be found in Jackson and Burgess (2000) and Loranger et al. (1997).

Reports of the psychometric properties of the IPDE ICD-10 Screener could not be located, although Loranger et al. (1997) noted that: "It is especially important to recognise that personality disorder questionnaires and semistructured clinical interviews are not interchangeable. Therefore, under no circumstances should the IPDE Screening Questionnaire be used to make psychiatric diagnoses" (p. 128). We disregarded that imperative because of the opportunity to obtain some estimate of the prevalence of PDs in the Australian community. As noted previously, such data are lacking at present. However, we again strongly argue for caution in accepting these data – they must be viewed as very tentative.

Physical conditions

As regards the measurement of physical conditions, this was done in the following way. In the course of working through the Mental Health and Wellbeing Survey, the interviewer asked the participant to respond to a number of questions within Section C of the survey. The interviewer asked the participant to endorse or not endorse having each of 12 chronic physical conditions. These were asthma, chronic bronchitis, anaemia, high blood pressure, heart trouble, arthritis, kidney disease, diabetes, cancer, stomach or duodenal ulcer, chronic gallbladder or liver trouble, or hernia or rupture.

Disability

Disability was assessed in five ways. First, by examining scores on the 0–12 point Brief Disability Questionnaire (BDQ). As reported in our earlier paper (Jackson and Burgess 2000), scores were dichotomized so that 2 or less equalled no disability and 3–12 equalled some disability. Second and third, disability was measured also by the SF-12, which provides dimensional summary scores for the Physical and Mental Summary Subscales, respectively. Fourth and fifth, total days out of role functioning and partial days out of role functioning provided measures of disability; both were calculated over the last 4 weeks.

Consultations sought

Section R of the survey asked a series of questions concerning the respondent's health care. The question (labelled R5) was: "In the past 12 months, ... have you seen any of the doctors or health professionals listed on this card regarding your own health?". This card listed a range of 15 health professionals, including GPs, psychiatrists, or psychologists who we felt were the most likely service providers for respondents with mental health problems. However, a later question (R7) asked: "How many of those consultations were ... related to mental problems such as stress, depression, or dependence on drugs or alcohol?". From the responses we were able to gauge the total number of consultations sought from the professionals of interest, namely GPs, psychologists, and psychiatrists. For both R7 (health vs. mental health) and R5, the numbers were then dichotomized, i. e., "sought consultation from" vs. "did not seek consultation from" GP, psychiatrist, or psychologist, respectively. This was because of the low numbers of people seeking consultation from the latter two disciplines for health and mental health problems.

Procedure

In the course of conducting the National Survey, the interviewer administered the 59-item Personality Disorder Screener. The respondent was required to respond 'true' or 'false' to the PD questions. Once the respondent had completed the Screener (i. e., completed sufficient items to indicate the likely presence or likely absence of a specific PD), the interviewer was asked a further two questions where the interviewee was likely to meet criteria for a PD (or PDs if that was the case). The first of these subsequent questions for each possible PD was whether "these feelings and experiences occurred throughout most of your life?" (scored 'no' or 'yes'). The second was whether "these feelings or experiences interfered with your life or activities a lot?" (also scored 'no' or 'yes'). To satisfy the lifetime criteria for PD 'caseness', the participant had to positively affirm both of these two questions.

For those respondents who met lifetime criteria for caseness and had experienced symptoms related to the PD criteria in the past 4 weeks, they were subsequently asked about the number of health professional consultations for these symptoms in the past 4 weeks. We did not report those data, but focused instead on consultations sought from three different types of practitioners over the past 12 months. They were also asked the following two questions to estimate the total and partial days out of role: (i) "Beginning yesterday, and going back 4 weeks, how many days out of the past 4 weeks were you totally unable to work or carry out your normal activities because of feelings or experiences like these?" and (ii) "... how many days in the past 4 weeks were you able to work and carry out your normal activities, but had to cut down on what you did, or did not get as much done as usual because of feelings or experiences like these?".

Results

Relationship between PD and disability at the general PD level

In order to examine the relationship between disability and PDs within the study sample ($n = 10\,641$), one had to take into account that participants could meet the criteria for one or more PDs, one or more physical conditions (e. g., asthma, diabetes, cancer, heart trouble, kidney disease), and one or more Axis I disorders. They could also meet the criteria for any combinations of these. Of the 10 641 respondents, 4240 people had one or more physical conditions, 1978 had one or more Axis I conditions and 704 persons had one or more PDs.

Five measures of disability were employed in the study. Each was treated as the dependent measure in five separate regression analyses. The first one was a logistic regression where the dependent variable was the BDQ, which was dichotomously classified into no disability vs. at least some disability. The second and third analyses were multiple regression analyses for the SF-12 Physical Summary and the SF-12 Mental Summary Subscale scores, respectively, as the dependent variables were dimensional. The fourth and fifth ones were logistic regression analyses for total days out of role functioning and partial days out of role functioning, respectively; for

both analyses the dependent variables were treated dichotomously, e. g., no days out of role vs. some days out of role. The independent variables were exactly the same for each of the five analyses: Axis I disorders, PDs, and physical conditions were entered as the three main effects and then combinations of the above were entered as interaction effects, namely, PD by Axis I, PD by physical condition, Axis I by physical condition, and finally, the three-way interaction of PD by Axis I by physical condition.

BDQ

For the BDQ, there were no significant interaction effects at all. The only two significant findings were for PD (OR = 1.88, CI = 1.33–2.67) and physical condition (OR = 4.86, CI = 3.21–7.36) with the odds ratio for the physical condition variable being clearly more than twice as much as for PD. Despite the lack of significant interactions, we decided to further examine for effects by constructing eight groups. These groups were: [1] no PD and no Axis I mental disorder and no physical condition; [2] those with PD only; [3] those with Axis I mental disorder only; [4] those with physical condition only; [5] those with PD and Axis I mental disorder; [6] those with PD and physical condition; [7] those with Axis I mental disorder and physical condition; [8] those with Axis I mental disorder and PD and physical condition. The numbers and proportions of people falling into each of the eight groups are shown in Table 1 together with the proportion of people with disability within each of those groups.

Pair-wise comparisons of each and every group were conducted and the chi-square statistic was applied to those comparisons. With three exceptions, differences between groups were found at the $p = 0.05$ level. The exceptions were as follows: there was no difference between those with an Axis I mental disorder and physical condition (group 7) and those with PD and physical condition (group 6) ($p = 0.07$). There was no significant difference in disability between those with PD only (group 2) compared to those with an Axis I mental disorder (group 3) ($p = 0.88$). Finally, there was no significant difference between those with PD and physical condition (group 6) and those with Axis I mental disorder and PD and physical condition (group 8) ($p = 0.32$).

A smaller proportion of group 1 members had disability compared to each and every one of the seven groups. A greater proportion of those in group 4 (those with physical condition only) had disability compared to those in groups 1, 2, 3, and 5, respectively. However, the addition of an Axis I mental disorder to physical condition appeared to further increase the percentage of group members with disability (i. e., compare group 7 with group 4). Similarly, the addition of PD to physical condition appeared to lead to an increase in the percentage of group members with disability (i. e., compare group 6 with group 4). The group with the combination of PD *and* physical condition *and* Axis I mental disorder contained the greatest proportion of members with disability (group 8) and was significantly different from all other groups with the exception of group 6 (PD and physical condition).

SF-12: Mental Summary Subscale scores

For the SF-12 Mental Summary Subscale score, the model fit was significant [F [7, 10633] = 366.31, $p = 0.000$, adjusted $R^2 = 19$. Significant t-values were recorded for the main effects of PD ($t = -9.20$, $p = 0.000$) and Axis I mental disorders ($t = -23.68$; $p = 0.000$), and the respective beta weights were –0.17 and –0.30. There was a significant interaction effect for Axis I disorders and physical conditions ($t = 4.82$, $p = 0.000$) with a beta weight of –0.07, indicating increased disability levels if a person had both an Axis I disorder and a physical condition.

SF-12: Physical Summary Subscale scores

For the SF-12 Physical Summary Subscale score, the model fit was significant [F [7, 10633] = 258.27, $p = 0.000$, adjusted $R^2 = 15$. Significant t-values were recorded for

Table 1 Number and percentages of respondents within the survey falling within diagnostic groupings and percentage within each group with at least some disability according to the BDQ

Group number	Group type	Number in group	Percentage of total sample n = 10641	Number within each group with some disability	Percentage within each group with some disability
1	No PD, no Axis I mental disorder, + no physical condition	5146	48.4	980	19.0
2	PD only	149	1.4	42	28.2
3	Axis I mental disorder only	886	8.3	255	28.8
4	Physical condition only	3241	30.5	1804	55.7
5	PD +Axis I mental disorder	220	2.1	84	38.2
6	PD + physical condition	127	1.2	89	70.1
7	Axis I mental disorder + physical condition	664	6.2	408	61.4
8	PD + physical condition + Axis I mental disorder	208	2.0	156	75.0

the main effects of Axis I disorders ($t = -3.78$, $p = 0.000$) and for physical conditions ($t = -36.57$; $p = 0.000$), and the respective beta weights were –0.05 and –0.37, respectively. There was no significant main effect for PD nor were there any significant interaction effects.

Total days out of role functioning

Given the skewed distribution of responses to this question, responses were dichotomized and it was found that 69/704 (9.8 %) of those with PD had 1 or more days out of role. This became the dependent variable in a logistic regression. PD was the only significant predictor with an *OR* of 6.32 (*CI* = 2.97–13.42).

Partial days out of role functioning

Again, the distribution of responses to this question was skewed and responses were dichotomized. There were 139/704 people with PDs (19.7 %) having 1 or more days of partial role functioning in the last month. A logistic regression found that PD was a significant predictor of partial days of role functioning (*OR* = 4.60; *CI* = 2.51–8.43) but so was Axis I (*OR* = 3.49; *CI* = 1.30–9.33). There were no interaction effects and no main effect for physical condition.

Relationships between the five disability measures

Table 2 shows the correlations among the five measures of disability.

It might be argued that the repetitive nature of the results reported earlier for each of the five measures might be due, at least in part, to the overlap among the five measures of disability, namely, that they are all assessing exactly the same domain. This was not borne out by the findings. Inspection of Table 2 shows that with two notable exceptions, the correlations were low. With one exception, all were significant where $p < 0.001$ (due to the very large sample size), but did not exceed $r = 0.19$ and, therefore, did not share more than 3.61 % of the variance. As regards the two notable exceptions, the strong negative relationship between the SF-12 Physical Summary Subscale score and BDQ is in fact misleading, and simply reflects the scoring direction of the two measures. For the dimensionally scored SF-12 Physical Summary Subscale, higher scores represent better performances, whereas for the dichotomously scored BDQ, a low score represents a better performance. The correlation represents a large effect size according to Cohen (1992) and indicates that the two scales share 38.44 % of the variance, perhaps suggesting that the two scales are measuring a somewhat similar construct. The correlation between the two measures of role functioning was of a medium effect size (Cohen 1992) with the two variables sharing 12.25 % of the variance.

Number of PDs and disability

In our previous study, we demonstrated that having one or more PDs was significantly associated with disability on the BDQ, the two subscales of the SF-12, and the two role functioning measures. In this study we attempted to investigate this finding in a more detailed fashion. First, we aimed to determine whether having a greater number of PDs, e. g., say three or more, as opposed to having one, was associated with more disability according to the BDQ and the two role functioning measures. Second, as regards the dimensionally rated SF-12 subscales, we were interested in ascertaining whether having an increasing number of PDs was associated with increasing disability. Before the analyses were conducted, we determined the numbers of respondents with PDs; 9937 had no PDs, 400 had one PD, 155 had two PDs, 63 had three PDs, 44 had four PDs, and 42 had five or more PDs.

BDQ

For the BDQ, 34.7 % of those with no PDs had at least some disability. For those with PDs the disability percentages were one PD = 47.8 %, two PDs = 58.1 %, three PDs = 55.6 %, four PDs = 65.9 %, and five or more PDs = 61.9 %. The overall result was significant with χ^2 [5] = 104.00, $p = 0.000$. Inspection of the adjusted residu-

Table 2 Correlations among five measures of disability

Variable	SF-12 Mental Summary Score	SF-12 Physical Summary Score	Personality disorders – total days out of role functioning	Personality disorders – partial days out of role functioning
Brief Disability Questionnaire	–0.14***	–0.62***	–0.07***	–0.07***
SF-12 Mental Summary Score		0.02	0.18***	0.19***
SF-12 Physical Summary Score			0.07***	0.04***
Personality disorders – total days out of role functioning				0.35***

***p < 0.001

als found that only for those with no PDs was there a significantly greater proportion of respondents with no disability than would be expected. A further series of chi-squares were then conducted to allow for further examination of pair-wise group comparisons but with those who had PD, i. e., one PD vs. two PDs, one PD vs. three PDs, one PD vs. four PDs, and one PD vs. five or more PDs; also two PDs vs. three PDs, two PDs vs. four PDs, two PDs vs. five or more PDs; then three PDs vs. four PDs, three PDs vs. five or more PDs; and finally, four vs. five or more PDs. Results revealed that a significantly smaller proportion of those with one PD had some disability compared to those with two, three, four, and five or more PDs. However, there were no significant differences among those with two, three, four, or five or more PDs.

SF-12

For the SF-12 Mental Summary and Physical Summary Subscale scores, the same groupings were used as the independent variable. Our previous paper (Jackson and Burgess 2000) found that those with one or more PDs obtained significantly greater SF-12 disability scores according to both subscales (Jackson and Burgess 2000). In this paper, we unpacked these results still further. We used one-way ANOVAs to detect an overall result for each of the two subscales, and then followed these up with Tukey's HSD post-hoc tests.

SF-12 Mental Summary Subscale score. Mean scores and SDs for this subscale are displayed in Table 3. Higher scores represent less disability. The overall ANOVA result was significant with $F\ [5, 10635] = 206.02$, $p = 0.000$. Post-hoc tests confirmed that those with no PD experienced less disability than each and every one of the five PD groupings whilst those with one PD had significantly less disability than those with two or more PDs. Those with two PDs endorsed significantly less disability than those with four, and five or more PDs, respectively, but not significantly less disability than those with three PDs. Those with three PDs did not differ significantly from those with four, or five or more PDs, respectively.

There was a quasi-linear trend for those with increasing numbers of PDs to experience increasing disability. Nevertheless, Table 3 indicates that whereas those with one PD obtained a mean of 8 points less than those with no PD, the differences from then on were smaller; hence, approximately 4 points separated those with two PDs from those with one PD, and 2.5 points separated those with three PDs from those with two PDs. A mean score of 3.5 points separated those with four PDs from those with three PDs, and the difference between those with four PDs and five or more PDs was neglible.

Table 3 SF-12 Disability scores (means and SDs) for number of PDs

Number of PDs	SF-12 Mental Summary Score	SF-12 Physical Summary Score
No PD	52.52 (8.74)	49.00 (9.95)
One PD	44.41 (11.96)	46.92 (11.00)
Two PDs	40.69 (12.66)	47.07 (11.30)
Three PDs	38.08 (12.03)	46.42 (12.18)
Four PDs	34.80 (9.92)	47.11 (10.46)
Five or more PDs	34.50 (10.86)	43.76 (11.86)

SF-12 Physical Summary Subscale score. Mean scores and SDs for this subscale are displayed in Table 3. Higher scores represent less disability. The overall ANOVA result was significant with $F\ [5, 10635] = 7.50$, $p = 0.000$. Those with no PD obtained a significantly better score than those with one PD, and significantly better than those with five PDs or more; they did not obtain significantly superior scores to those with two, three, or four PDs, respectively. Those with one PD did not significantly outperform those with two, three, four, or five or more PDs, and indeed there were no significant differences for any of the remaining PD comparisons. Inspection of Table 3 indicates that a mean score of about 3 points blankets the PD groupings of one to five (or more) PDs.

Total days out of role functioning. For the total days out of role functioning, 0.3 % (28/9937) of those with no PDs had at least 1 or more total days out of role functioning. This compared with 2.3 % (9/400) of those with one PD, 5.8 % (9/155) of those with two PDs, 7.9 % (5/63) of those with three PDs, 18.2 % (8/44) of those with four PDs, and 23.8 % (10/42) of those with five or more PDs. The overall result was significant [$\chi^2\ (5) = 712.30$, $p = 0.000$]. Inspection of the adjusted residuals found that only for those with no PDs was there a significantly smaller proportion of respondents with total days out of role functioning than would be expected by chance. As with the BDQ, a further series of chi-squares was then conducted to allow for further examination of pair-wise group comparisons but with those who had PD, i. e., one PD vs. two PDs, one PD vs. three PDs, and so on. Results were that a significantly smaller proportion of those with one PD had total days out of role functioning compared to those with four PDs and those with five or more PDs; they did not differ from those with two and three PDs. A significant proportion of those with two PDs had total days out of role functioning compared to those with five or more PDs, but they did not differ from those with three and four PDs. Also, a significantly smaller proportion of those with three PDs had total days out of role functioning compared to those with five or more PDs, but they did not differ from those with four PDs. There was no difference between those with four PDs compared to those with five or more PDs.

Partial days out of role functioning. For the partial days out of role functioning, 0.7 % (66/9937) of those with no PDs had at least 1 or more partial days out of role functioning. This compared with 7 % (28/400) of those with one PD, 10.3 % (16/155) of those with two PDs, 14.3 %

(9/63) of those with three PDs, 18.2% (8/44) of those with four PDs, and 28.6% (12/42) of those with five or more PDs. The overall result was significant [χ^2 [5]= 651.80, $p = 0.000$]. Inspection of the adjusted residuals found that only for those with no PDs was there a significantly smaller proportion of respondents with partial days out of role functioning than would be expected by chance. Again, as with the BDQ and with total days out of role functioning, a further series of chi-squares was then conducted; this allowed for further examination of pair-wise group comparisons but with those who had PD, i. e., one PD vs. two PDs, one PD vs. three PDs, and so on. Results were that a significantly smaller proportion of those with one PD had total days out of role functioning compared to those with five or more PDs; they did not differ from those with two, three, and four PDs. A significant proportion of those with two PDs had total days out of role functioning compared to those with five or more PDs, but they did not differ from those with three and four PDs. There were no differences among those with three, four, and five or more PDs.

Mental health consultations

A total of 1948 people (18.3%) of the survey sample had presented in the last 12 months to a general practitioner (GP) for a health problem and 981 (9.2%) of the survey sample had presented to a GP with a mental health problem. A total of 235 people (2.2%) of the survey sample had presented to a psychiatrist for a health problem and 213 (2%) of the total survey sample had sought consultation with a psychiatrist for a mental health problem. A total of 220 (2.1%) of the total sample had presented to a psychologist for a health problem and 188 (1.8%) had sought consultation with a psychologist for a mental health problem.

Table 4 displays the results of a series of logistic regressions undertaken to predict presentation to a GP, psychiatrist, or psychologist for health and mental health problems. Table 4 reveals that respondents were only likely to present to GPs with health problems if they had a physical condition. There was no other main effect nor were there any interaction effects. It was more complicated, however, when focusing on presentations to GPs for mental health problems; here, there were significant results for all three major variables and one interaction effect, namely that for PD x Axis I disorders. Graphical representation and a contingency table revealed that respondents with *both* PD and Axis I disorders were significantly more likely to present to GPs with mental health problems.

Participants were most likely to present to psychologists and psychiatrists for health or mental health if they had PD or Axis I disorders. They were not likely to present to those mental health specialists with physical conditions. There was no interaction between PD, and/or Axis I disorders and/or physical conditions.

Discussion

Results confirmed at the population level what a number of other more circumscribed studies have found and that is that PD is associated with disability (Andreoli et al. 1989; Hueston et al. 1996; Johnston et al. 2000; Nakao et al. 1992) even when Axis I mental disorders, that may be comorbid with PD, are taken into account. The current study extended the literature further, by also taking into account physical conditions that were very common in this sample (4240/10641). Also important was that disability was found to be associated with PD across four of the five measures of disability used in the study. These results appeared to be strongest for the SF-12 Mental Summary Subscale score and the two role functioning measures even though these three dependent variables were only weakly related amongst one another. PD was not a significant predictor of the SF-12 Physical Summary Subscale score and this would seem to make logical sense. The results were weaker too for the BDQ,

Table 4 Significant results from a series of logistic regressions in predicting presentation to a general practitioner, psychiatrist, or psychologist for health or mental health problems

Service providers	Variable	Odds ratios	Confidence limits (95%)
General practitioner			
health problems*	Physical conditions	2.35	1.30–4.24
mental health problems*	Personality disorder (PD)	1.97	1.43–2.70
	Axis I disorders	5.58	3.19–9.74
	Physical conditions	1.56	1.06–2.29
	PD x Axis I	2.03	1.11–3.72
Psychiatrist			
health problems*	Personality disorders	2.25	1.39–3.64
	Axis I Disorders	5.39	1.85–15.65
mental health problems*	Personality disorders	2.47	1.52–4.02
	Axis I disorders	7.24	2.17–24.21
Psychologist			
health problems*	Personality disorders	2.61	1.51–4.51
	Axis I disorders	4.20	1.43–12.37
mental health problems*	Personality disorders	2.66	1.53–4.65
	Axis I disorders	5.39	1.59–18.29

Only significant results are displayed in the table for each regression

which is strongly related to the SF-12 Physical Summary Subscale score; both appear to index disability due to physical problems. To illustrate, here is an example from the SF-12 Physical Summary Subscale: "B3. Climbing several flights of stairs. Does your health now limit you a lot, limit you a little, or not limit you at all?". An example from the BDQ is: "Q2. Have you had to cut down or stop any activity you used to do, such as hobbies, because of some illness or injury?". However, although the BDQ appears to index disability due to physical health, when the BDQ results were further examined by constructing eight groups, some interesting findings emerged. The group which contained members who had both PD *and* physical condition, contained a significantly greater proportion of people with disability (70.1 %) compared to the group which contained those people with physical condition only (55.7 %). The group which contained people who had PD *and* Axis I mental disorder *and* physical condition was the group with the highest proportion of people with disability (75 %) – significantly higher than those who had physical condition only, but not significantly different from those with PD *and* physical condition.

As regards the number of PDs, there did seem to be some indication of increasing disability according to the SF-12 Mental Summary Subscale measure with the increasing number of PDs. For the total days out of role functioning and partial days out of role functioning measures, the greatest proportion of people with disability had five or more PDs and the smallest proportions most noticeably were those with no PD, and then, in order, those with one PD and then two PDs. For the two role functioning measures, the addition of further PDs past two or three PDs did not result in further increases in disability. The presence of one PD was clearly associated with greater disability compared to having no PD for the SF-12 Physical Summary Subscale but the addition of further PDs was not associated with significantly greater disability. For the BDQ, those with no PD had the least disability and those with one PD outperformed those with more than one PD, but the addition of a further number of PD diagnoses did not significantly increase levels of disability; the results for the latter two measures may be due in part to the nature of those measures – they appear to index physical health.

There were some interesting findings regarding health consultations. First and somewhat reassuringly, people with PD were not more likely to visit a GP for health problems – in fact, not surprisingly, those with a physical condition were more likely to present to a GP for health problems. PD and physical conditions were predictors of presentations to GPs for mental health problems, although not as strong a predictor as Axis I mental disorders. Interestingly, there was a synergistic effect of Axis I mental disorders with PD in predicting mental health consultations with a GP.

Again, somewhat reassuringly, people with PD and Axis I mental disorders, but not physical conditions, were more likely to present to psychologists and psychiatrists with health or mental health problems. It is important to note that people with Axis I mental disorders were between 1.5 and 2.75 times more likely than those with PDs to present to psychiatrists or psychologists over the last 12 months. There were no interaction effects. Of interest is the finding that only 1.8 %–2.2 % of the total sample presented to psychologists or psychiatrists for help for health or mental health problems in the last 12 months. We chose to analyze the data in terms of the number of people who presented for health or mental health problems, rather than the number of times a person presented for help, because of the small proportion of the total sample presenting for help in the last 12 months.

The current study is an improvement over those investigations that currently comprise the extant literature. The reasons for this are first and foremost because it considered the fact that PD, Axis I disorders, and physical conditions may co-exist in the same person. So all three were included as main effects in a series of logistic and multiple regressions. This approach permitted one to determine whether PD made a contribution to the prediction of disability over and above comorbid Axis I conditions and physical conditions. Moreover, each was considered within interactive terms in the same regressions. A second strength of the current study was that it was a population-based study and, therefore, relatively free of the setting and selection biases that plague virtually all other germane studies; by focusing on disability in a population-based sample, the current study adds to the extant epidemiological literature (e. g., de Girolamo and Reich 1993; Kessler et al. 1994; Meltzer et al. 1994; Reich et al. 1989; Robins and Regier 1991; Wells et al. 1989). A third strength of the current study was that it used multiple measures of disability, rather than relying on a single measure and showed that the strength of the results for PD depended in part on the measure of interest.

The most notable weaknesses of the study are that it employed a measure – which was intended as a screening measure – for which we could locate no psychometric properties. The study questionnaire had few items and was reliant on the skill of the layperson and there were few questions to index the presence or absence of specific PDs. There is also the related issue of the effect of Axis I disorders or state factors generally on the self-reportage of PDs; respondents may report more features of PD when depressed, for example, than when they are euthymic (for a fuller discussion of these issues, see Jackson and Burgess 2000).

Another weakness pertained to the assessment of physical conditions; physical conditions were assessed by the interviewer asking the participant to endorse (or not) a number of disorders from a list of chronic physical conditions. These conditions included asthma, cancer, diabetes, and so on. Of course, the major limitation is that the information given is totally dependent on the accuracy of the participants' self-reports. It may be that respondents were not aware of the physical conditions

they actually had because they had not sought medical consultations for some time, or had inaccurately recalled information given to them or were invested in denying having such conditions. All of these possibilities possess some face validity in the absence of a report from the respondent's general practitioner or, failing that, a report from an independent medical practitioner including a physical examination of the participant. On the other hand, providing a report and a physical examination would have been financially prohibitive in a survey of this magnitude. Future studies could conduct a physical examination in the second stage of a survey, and obtain medical information on a small subsample of those surveyed in the first stage of a survey. This would allow a comparison of the self-report information and the independently obtained information on physical conditions; however, this procedure could prove expensive even if the subsample was quite small.

A third weakness concerns the disability measures. This necessarily involves consideration of two parameters: first, whether or not the disability measure is tied specifically to a condition, and second, the time period over which the measure assesses disability. For two of the five measures – the two role functioning indices – disability refers specifically to PD – the respondent is asked to assess how the specific condition, i. e., PD, has affected their functioning in the past 4 weeks. On the other hand, the remaining three measures are assessed without any specific reference to PD or, in fact, other mental disorders or physical conditions. Furthermore, most (but not all) of the specific questions on the SF-12 refer to the past 4-week period. The BDQ questions refer either to "currently" or the past 1-month period. This then raises a further issue as to whether the disability assessed is persistent or fluctuates over time. It could well be true that a person with PD might experience periods of relatively good functioning punctuated by periods of poor functioning. Conversely, a second person with PD might experience relatively sustained levels of poor functioning (i. e., severe disability over a long period of time). The findings of the current study are unable to shed light on this particular issue given the short time frame of the two role functioning measures and most (but not all) of the specific questions on the SF-12 and the BDQ; it would require a longitudinal repeated measures design to accurately address this issue.

A fourth weakness pertains to the percentages of variance explained by the full regression models for the SF-12 Mental Summary Subscale and the Physical Summary Subscale scores. They are not large (19 % and 15 %, respectively), but attain significance, of course, because of the very large sample size. We cannot be sure what accounts for the remainder of the variance for these disability measures, except to say that it would include the reliability of the estimate of measurement. There is also the possibility that other potential predictor measures were not included in the Survey. These measures may have explained more of the variance over and above that explained by those measures included in our regression models.

Finally, clinical opinion might have it that PDs in combination with Axis I mental disorders would increase the likelihood of consultation; however, there are two possible reasons why this may not have occurred in the current data analyses. The first is that the question (R7) asked "(How many of those consultations were/Was that consultation) related to mental problems such as stress, anxiety, depression, or dependence on drugs or alcohol?". As one can see from the wording of this question, there is no specific reference to PD features as such, thereby making it harder to detect an effect. Indeed, as can be seen from Table 4, the odds ratios for Axis I disorders were approximately two to three times higher than for PD, irrespective of the type of practitioner approached by the participant. The second possible reason is a statistical one. It is more difficult to detect interaction effects because of power considerations, e. g., a two-way interaction (i. e., 2 x 2) essentially produces four cells. This power to detect differences is worsened if there is a low number of positive cases (i. e., those seeking consultations). In fact, a significant interaction effect was found between Axis I condition and PD for those seeking help from GPs for mental health problems but not for those seeking help from psychiatrists and psychologists, respectively. However, 981 (9.2 %) people had consultations for mental health problems with GPs, and only 213 (2 %) and 188 (1.8 %) from psychiatrists and psychologists, respectively.

Conclusion

The strength of the study is that it took place in the context of a nationwide survey of the complete range of PD types using ICD-10 criteria. Furthermore, it appears to confirm at the population level what the more circumscribed studies in the general psychiatric literature have found, namely that PD in its own right is significantly predictive of disability and mental health consultations. Obviously, we would like to conduct similar analyses at the specific PD level, rather than remaining at the general PD level. This would allow us to answer the question: "Are some specific PDs more likely to be associated with more disability than other specific PDs?". For example, is disability higher amongst people with say, borderline PD, than anankastic (obsessive-compulsive) PD? Our next paper will in fact attempt to answer this question.

Acknowledgements The National Survey of Mental Health and Wellbeing was funded by the Mental Health Branch of the Commonwealth Department of Health and Aged Care, under the National Mental Health Strategy; it was conducted by the Australian Bureau of Statistics. Also, we would like to thank the three anonymous reviewers who made constructive comments as regards improving the manuscript.

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