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Psychological distress among refugees in Germany: a cross-sectional analysis of individual and contextual risk factors and potential consequences for integration using a nationally representative survey

Lena Walther [iD],[1] Hannes Kröger,[2] Ana Nanette Tibubos,[3] Thi Minh Tam Ta,[1] Christian von Scheve,[2,4] Jürgen Schupp [iD],[2,4] Eric Hahn,[1] Malek Bajbouj[1]

ABSTRACT

Objectives Responding to the mental health needs of refugees remains a pressing challenge worldwide. We estimated the prevalence of psychological distress in a large refugee population in Germany and assessed its association with host country factors amenable to policy intervention and integration indicators.

Design A cross-sectional and population-based secondary analysis of the 2017 wave of the IAB-BAMF-SOEP refugee survey.

Setting Germany.

Participants 2639 adult refugees who arrived in Germany between 2013 and 2016.

Main outcome measures Psychological distress involving symptoms of depression, anxiety and post-traumatic stress disorder was measured using the Refugee Health Screener-13.

Results Almost half of the population surveyed (41.2% (95% CI: 37.9% to 44.6%)) was affected by mild, moderate or severe levels of psychological distress. 10.9% (8.4% to 13.5%) of the population screened positive for severe distress indicative of an urgent need for care. Prevalence of distress was particularly high for females (53.0% (47.2% to 58.8%)), older refugees (aged ≥55, 70.4% (58.5% to 82.2%)) and Afghans (61.5% (53.5% to 69.5%)). Individuals under threat of deportation were at a greater risk of distress than protection status holder (risk ratio: 1.55 (95% CI: 1.14 to 2.10)), single males at a greater risk than males with nuclear families living in Germany (1.34 (1.04 to 1.74)) and those in refugee housing facilities at a greater risk than those in private housing (1.21 (1.02 to 1.43)). Distressed males had a lower likelihood of employment (0.67 (0.52 to 0.86)) and reduced participation in integration courses (0.90 (0.81 to 0.99)). A trend of reduced participation in educational programmes was observed in affected females (0.42 (0.17 to 1.01)).

Conclusion The finding that a substantial minority of refugees in Germany exhibits symptoms of distress calls for an expansion of mental health services for this population. Service providers and policy-makers should consider the increased prevalence among female, older

Strengths and limitations of this study

- ► This is the first large-scale, representative study investigating the prevalence of psychological distress and its potential link to the process of integration in a whole (multi-national and multi-cultural) population of recently arrived refugees in Europe during the height of the refugee influx— between 2013 and 2016 in Germany.
- ► The psychological distress measure, which assesses central symptoms of the most common mental illnesses among refugees, was developed specifically for refugees and has shown good psychometric properties in a range of refugee subpopulations.
- ► As necessitated by the large-scale survey design, the psychological distress measure was self-reported, which comes with the limitation of individual readings of the items and recall bias, and a diagnostic proxy rather than a diagnostic tool that can also distinguish between the conditions whose symptoms it comprises.
- ► This study is correlational, meaning that it is not possible to draw conclusions about causality or directions of effects.

and Afghan refugees, as well as among single males, residents in housing facilities and those under threat of deportation. The associations between mental health and integration processes such as labour market, educational programme and integration course participation also warrant consideration.

INTRODUCTION

Due to the Syrian exodus and ongoing conflicts in Iraq, Afghanistan, Eritrea and Somalia, Europe has seen a sharp increase in the number of asylum applications lodged in its member states in the past years, with a peak 1.6 million applications in 2015.[1] Germany

is a particularly important case because it received the largest number of refugees in Europe, with 890 000 new registrations in 2015.[2] The countries of origin as well as the reasons for flight are diverse, and the great influx of refugees creates entirely new postmigration challenges for host societies and refugees alike.

Prior research has consistently shown that refugees are at a particular risk of poor mental health both as a consequence of adverse or traumatic premigration and perimigration experiences and as a result of postmigration difficulties.[3–6] It is, therefore, imperative to get reliable estimates of the prevalence of mental health problems among refugee populations and to understand how health as a potential key 'marker and means'[7] of successful integration is related to different aspects of postmigration life.

Meta-analyses indicate that depression and anxiety are at least as common as post-traumatic stress disorder (PTSD)[8 9] and suggest that one or a combination of these conditions affects at least one in three refugees.[9 10] However, considerable heterogeneity of prevalence rates is reported.[6 8–10] Reasons for this heterogeneity likely include methodological differences, such as the use of different scales (with varying levels of cultural sensitivity) and sampling procedures, or methodological shortcomings such as small and non-representative samples.[10] There are also substantive differences between the refugee populations studied—such as their cultural and national origins, their living conditions in their host countries and varying lengths of stay since arrival. These complications underscore the need for host country-specific, duration of stay-specific, large-scale and representative epidemiological studies to understand overall prevalence and prevalence by key sociodemographic categories, like gender, age, country of origin and level of education.

It has become increasingly recognised that the relationship between conditions of postmigration life and refugees' mental health should be studied in addition to the effects that past experiences in the country of origin and during flight. Large-scale, representative investigations into these associations, however, are scarce. The few studies that do exist (e.g. from Sweden[11] and Australia[12]) underscore the importance of postmigration stressors such as economic strain, problems learning the language and adapting culturally, perceived discrimination and worries about the family. These studies focused mainly on subjective, psychometric indicators of postmigration difficulties rather than objective indicators of integration.

Employing objective assessments, meaning facts about living circumstances, has two distinct advantages: responses to these items are not susceptible to response bias due to poor mental health, and they also translate readily into concrete integration and health policy recommendations.

Smaller studies have shown that the following three primary contextual factors of refugees' lives after resettlement are negatively related to mental health: legal status insecurity,[13] residing in refugee housing facilities[14 15] and family separation.[16] In Germany, legislation on matters of legal status and family reunification has been central to integration policy and discourse.[17 18] Providing private housing for refugees has been a challenge due to shortages in affordable housing, and conditions in refugee accommodation are heterogeneous due to an absence of federal regulations.[19] As chief responsibilities of and challenges for host societies, these domains are amenable to intervention both as protective and risk factors for refugees' mental health.

There are also aspects of integration that are much more subject to the agency of individual refugees, namely: labour market participation, which has also been associated with mental health,[20 21] participation in formal education and participation in programmes designed by the host society to facilitate integration, such as the so-called 'integration courses' in Germany that were opened to refugees and asylum seekers in 2015.[22] The mental health of refugees may influence their ability to use these routes of integration, as has been found in previous studies,[23 24] for example, by limiting their capacities to overcome the bureaucratic obstacles that are associated with gaining access to these institutions.[22] Understanding these under-researched associations between mental health and integration[23 24] is of key importance both to health policy and to integration policy, which can play its part in easing access.[25]

In sum, the literature on refugee mental health lacks population-based estimates of the prevalence of mental health problems among refugees, also by sociodemographic subcategories. Large-scale studies examining the association between mental health and objective measures of postmigration contextual factors and integration are also scarce. The present study fills this gap by estimating the prevalence of psychological distress indicative of poor mental health using a rare large-scale, representative survey of refugees who arrived in Germany between 2013 and 2016. It also identifies sociodemographic characteristics and postmigration factors that could put members of this population at risk: legal status, family separation and housing. Finally, we examine the relationship between psychological distress and the key aspects of integration mentioned above: employment, participation in education and integration courses.

METHODS
Sample
The data analysed in this study come primarily from the second wave (conducted throughout 2017) and partly from the first wave (conducted throughout 2016) of the refugee survey carried out by the Institute for Employment Research (IAB), the Research Centre on Migration, Integration and Asylum of the Federal Office for Migration and Refugees (BAMF-FZ) and the Socio-Economic Panel (SOEP) at the German Economic Research Institute; the IAB-BAMF-SOEP refugee survey. The survey sample is representative of adults who arrived in Germany

between 1 January 2013 and 31 January 2016 and applied for asylum or were part of a humanitarian resettlement programme, and also includes adult members of their households. As explained in detail elsewhere,[26 27] these core respondents were drawn from the German Central Register of Foreign Nationals (AZR), with different sampling probabilities applied based on factors such as country of origin, age, gender and legal status to ensure the representation of different individual characteristics (see section S1.1–3 of the online supplementary material). The first wave of the survey comprised 4527 adults; the response rate was 48.7%. The follow-up rate for the second wave was 73%, with 2639 participants returning to the survey (for details on the response rate, see S1.2 in the online supplementary materials). While there were also new participants in the second wave, only those 2639 participants returning from the first wave filled out the Refugee Health Screener 13 (RHS-13) screener. We analysed data from 2569 of these participants, having excluded 70 participants who were not themselves refugees or asylum seekers who arrived in Germany between 2013 and 2016, but household members.

Most of our variables were observed in the second wave; nationality, year of arrival in Germany and family constellation (see details on postmigration variables below) were observed in the first wave, as was one level of the legal status variable ('Protected since 2016'). Since the level of education variable had 16.7% missing values in the second wave, and level of education is unlikely to shift between the two waves, we substituted second wave missing values with first wave values.

Respondents completed the questionnaire in computer-assisted face-to-face interviews with professional interviewers aided by audio files in seven different languages: English, German, Arabic, Farsi, Pashtu, Urdu and Kurmanji.

Mental health measure

We measured psychological distress encompassing symptoms of depression, anxiety and PTSD using the 13-item version of the RHS-13.[28 29] Its reliability and validity in a sample representative of the refugees who arrived in Germany at the end of 2015 or the beginning of 2016 were evidenced in a recent study.[30] The psychological distress screening cut-off score for the RHS-13 was set at 11 or more points in total and designed to capture mild forms of distress indicative of a need for further assessment or perhaps preventive treatment, as well as more severe forms.[29 31] A later study validated further cut-off points for moderate symptoms levels indicative of a likely need for treatment and severe levels indicative of an urgent need for care (18 and 25 points, respectively).[31]

Sociodemographic characteristics

We analysed gender, age, nationality and level of education as potential risk factors for psychological distress based on previous literature. We categorised age as 10-year bins, with the exception of a bin for young adults

(18 to 24-year-olds) and a bin for those aged 55 or older due to the limited number of older respondents. Out of the 51 nationalities represented among respondents, only nationalities represented by at least 100 respondents were included individually in the analysis; the remaining nationalities were grouped into an 'Other' category. Level of education was ascertained based on the International Standard Classification of Education of 2011, grouped into 'low', 'middle' and 'high'.

Postmigration factors

We focused on three aspects of postmigration life: legal status, family constellation in Germany and housing situation. We chose these factors for their potential to inform integration policy. Legal status was divided into 'Protected since 2016' and 'Protected since 2017', which include various different protection statuses reported in either the 2016 and 2017 survey waves ('since 2016') or only in 2017 ('since 2017'), as well as 'Applicant', 'Suspension of Deportation' and 'Other'. We created a 3-category family constellation variable from first wave data (the location of children was not ascertained again in 2017; births since the first wave were taken into account) with the following levels: individual (1) has minor children or a spouse, but all of them live in Germany, (2) has a spouse or at least one minor child abroad, (3) is unattached (no spouse or minor children). In order to contrast residency in refugee housing facilities with residency in private housing, we included a binary housing variable.

Integration measures

We chose employment and participation in education programmes and integration courses as measures of integration, as they are essential indicators of structural integration into the host society.[7] Our employment status variable includes any form of employment reported. Educational programmes include any form of in-person education. Course participation is assessed as a binary of having participated in at least one of seven language or integration courses or not.

Statistical analysis

All analyses were carried out in R (V.3.5.1). We applied survey weights multiplied by a longitudinal weight provided with the survey data[26 27 32] in all calculations except where otherwise specified. The weights are provided by the SOEP survey and combine design weights (for stratified sampling from the registry), household non-response corrections and poststratification to known demographic characteristics (based on the registry information, see section S1.3 of the online supplementary materials for details on the survey weights). Due to a small percentage of missing data from item non-response in our primary outcome variable and some independent variables (<10%), we imputed our data using multiple imputation using chained equations[33] (for details of our imputation and missing proportion per variable, see the S1.4 and online supplementary table S1 in the online

supplementary materials). All analyses with imputed data were pooled across our 50 imputed datasets using Rubin's Rule.[34]

To describe our sample and population, we calculated proportions and, for the population estimates, 95% CIs for all analysis variables. As a preliminary step to the remaining analyses, which all centre around the RHS, we assessed the scale's internal consistency using Cronbach's alpha and its factor structure using parallel analysis in our sample (unimputed, unweighted data). In the first main analysis step, we estimated the prevalence of psychological distress (and 95% confidence intervals (CIs)) per sociodemographic category. In the second part of the analyses, we estimated risk ratios (RRs) and Wald-type CIs from gender-stratified multivariable robust (modified) Poisson regression models[35] predicting the binary RHS score at the 11-point cut-off from each of the host country contextual factors outlined above, adjusting for sociodemographic characteristics and year of arrival. Finally, we estimated the RRs of psychological distress (binary RHS score category at the 11-point cut-off) as an independent variable predicting current employment status (yes=1 or no=0), participation in education programmes (yes=1 or no=0) and participation in integration courses (yes=1 or no=0) from gender-stratified modified Poisson regression models, adjusting for sociodemographic characteristics and year of arrival. All models, estimated with the 'svyglm'-function in the R package 'survey', used robust variance estimation (sandwich estimator).[32] All regression estimates were exponentiated to produce RRs. This is the advantage of using modified Poisson models instead of logistic regression, for which the direct interpretation of the coefficients as relative risks is only possible in approximation under the 'rare disease' assumption (prevalence <10%),[36] which does not hold for many of our outcomes.

Patient and public involvement

There was no patient or public involvement in this study.

RESULTS

Sample and population characteristics

The main sociodemographic characteristics of the sample (raw data) and the population under study (imputed and weighted) as well as other characteristics used in our analyses are summarised in table 1. The sample is 36.6% female; mostly aged between 25 and 44, with 16.9% aged 18–24 and only 17.6% aged 45 and older; 53.4% Syrian, 12.6% Afghan and 12.1% Iraqi; and mostly has a low level of education, with 59.6% without upper secondary education. Table 1 also shows sample and population proportions of the postmigration and integration factor subcategories. Online supplementary table S2 of the online supplementary file shows gender-stratified population proportions for the analysis variables that are used in gender-stratified analyses below.

RHS-13 scale reliability

The RHS-13 exhibits excellent internal reliability in our sample (Cronbach's alpha=0.91). Our parallel

Table 1 Sample and population characteristics

Sociodemographic characteristic	Raw data Proportion in % (absolute frequencies)	Weighted, imputed data Proportion (95% CI) in %
Gender		
Male	63.4 (1630)	74.6 (72.1 to 77.2)
Female	36.6 (939)	25.4 (22.8 to 27.9)
Age		
Ages 18–24	16.9 (434)	28.1 (24.9 to 31.3)
Ages 25–34	34.7 (890)	39.8 (36.6 to 42.9)
Ages 35–44	30.8 (792)	20.0 (17.5 to 22.4)
Ages 45–54	13.5 (347)	7.9 (6.6 to 9.2)
Over 54 years old	4.1 (105)	4.3 (3.0 to 5.6)
Nationality		
Syrian	53.4 (1372)	44.2 (41.1 to 47.3)
Afghan	12.6 (323)	13.6 (11.4 to 15.9)
Iraqi	12.1 (311)	8.5 (7.0 to 9.9)
Eritrean	6.5 (167)	6.2 (4.9 to 7.5)
Other	15.4 (396)	27.5 (24.1 to 31.0)
Level of education		
Low level of education	59.6 (1432)	58.7 (55.4 to 61.9)
Medium level of education	21.0 (505)	23.0 (20.2 to 25.9)
High level of education	19.4 (466)	18.3 (16.0 to 20.7)
Legal status		
Protected since 2016	54.5 (1384)	43.7 (40.5 to 46.8)
Protected since 2017	21.3 (540)	23.0 (20.1 to 25.9)
Applicant	15.5 (393)	22.2 (19.2 to 25.3)
Suspension of deportation	4.6 (118)	6.7 (4.7 to 8.6)
Other	4.2 (106)	4.5 (3.0 to 5.9)
Nuclear family constellation		
All in Germany	62.7 (1586)	36.4 (33.6 to 39.2)
Someone abroad	10.9 (277)	15.7 (13.3 to 18.2)
Unattached	26.4 (668)	47.9 (44.6 to 51.1)
Housing		
Private housing	80.3 (2064)	67.1 (63.8 to 70.5)
Refugee housing	19.7 (505)	32.9 (29.5 to 36.2)
Employment		
Not employed	77.9 (2001)	72.6 (69.6 to 75.5)
Employed	22.1 (568)	27.4 (24.5 to 30.4)
Education		
Not in education	91.5 (2343)	88.7 (86.6 to 90.7)
In education	8.5 (218)	11.3 (9.3 to 13.4)
Course participation		

Continued

Table 1 Continued

Sociodemographic characteristic	Raw data Proportion in % (absolute frequencies)	Weighted, imputed data Proportion (95% CI) in %
No course participation	23.3 (594)	24.4 (21.4 to 27.3)
At least on course attended	76.7 (1950)	75.6 (72.7 to 78.6)

Values in column 3 were weighted and pooled from 50 multiply imputed datasets.

analysis suggests a one or two-factor solution for the RHS-13 (adjusted eigenvalues and proportions of variance explained for the first three extracted factors: 6.08 (46.8%), 1.22 (9.4 %), 0.81 (6.2%)). Due to the low explanatory power of the second factor, treating the RHS-13 as representing a one-factor construct seems appropriate for our study.

Prevalence of different levels of psychological distress

As shown in table 2, overall 19.7% (17.0% to 22.4%) of refugees who arrived in Germany between 2013 and 2016 exhibit mild psychological distress indicative of a need for further assessment, 10.6% (8.5% to 12.7%) exhibit moderate levels of psychological distress indicative of a

likely need for treatment and 10.9% (8.4% to 13.5%) are estimated to be severely distressed, indicative of an acute need for care. In total, 41.2% (37.9% to 44.6%) screen positive for psychological distress, comprising symptoms of depression, anxiety and PTSD according to the original 11-point scale cut-off for the RHS-13.

Table 2 shows that females experience more distress than males and more often require immediate care for severe levels of distress (females: 17.4% (11.7% to 23.0%), males: 8.7% (6.0% to 11.5%)). Those aged 35 or older are far more likely than younger refugees to exhibit severe psychological distress (e.g., in 35–44 category: 53.2% (46.3% to 60.1%) no distress, in 25–34: 65.2% (60.3% to 70.0%)). A distinction by nationality shows that Afghans experience the most distress. While mild distress is, broadly speaking, equally present between nationality categories, moderate and severe distress appears to be particularly prevalent among Afghans, with a noteworthy 18.9% (11.2% to 26.6%) prevalence of moderate distress and a 19.9% (11.6% to 28.2%) prevalence of severe distress, compared to, for example, 9.3% (6.7% to 11.9%) and 6.7% (4.6% to 8.8%), respectively, among Syrians. See the online supplementary table S3 for a regression analysis showing that the prevalence of distress among Afghans appears not to be due to legal status concerns alone: this analysis was stratified to include only those fully recognised as refugees, and Afghan nationality is still

Table 2 Unadjusted prevalence of different levels of psychological distress by sociodemographic characteristic in per cent

	None	Mild	Moderate	Severe
Overall	58.8 (55.4 to 62.1)	19.7 (17.0 to 22.4)	10.6 (8.5 to 12.7)	10.9 (8.4 to 13.5)
Gender				
Male	62.8 (58.8 to 66.7)	18.7 (15.6 to 21.9)	9.8 (7.3 to 12.3)	8.7 (6.0 to 11.5)
Female	47.0 (41.2 to 52.8)	22.6 (17.6 to 27.7)	13.0 (9.1 to 16.9)	17.4 (11.7 to 23.0)
Age				
Ages 18–24	61.8 (54.4 to 69.1)	19.5 (13.8 to 25.2)	8.4 (4.7 to 12.0)	10.4 (4.5 to 16.3)
Ages 25–34	65.2 (60.3 to 70.0)	17.4 (13.6 to 21.3)	11.2 (7.6 to 14.8)	6.1 (3.8 to 8.5)
Ages 35–44	53.2 (46.3 to 60.1)	21.4 (15.5 to 27.4)	9.6 (5.2 to 14.0)	15.8 (9.1 to 22.5)
Ages 45–54	45.8 (37.5 to 54.2)	18.9 (12.8 to 25.1)	12.4 (7.8 to 17.1)	22.8 (14.9 to 30.6)
Over 54 years	29.6 (17.8 to 41.5)	35.4 (19.2 to 51.6)	20.6 (6.9 to 34.4)	14.4 (1.1 to 27.6)
Nationality				
Syrian	65.0 (61.1 to 68.9)	19.0 (15.9 to 22.1)	9.3 (6.7 to 11.9)	6.7 (4.6 to 8.8)
Afghan	38.5 (30.5 to 46.5)	22.7 (15.6 to 29.8)	18.9 (11.2 to 26.6)	19.9 (11.6 to 28.2)
Iraqi	64.8 (56.8 to 72.7)	16.4 (10.1 to 22.8)	8.1 (4.2 to 12.1)	10.7 (5.5 to 15.9)
Eritrean	75.2 (66.4 to 83.9)	16.3 (8.4 to 24.3)	6.1 (1.6 to 10.5)	2.4 (-0.1 to 4.9)
Other	53.3 (45.0 to 61.6)	21.1 (14.0 to 28.1)	10.3 (5.5 to 15.1)	15.3 (8.4 to 22.2)
Level of education				
Low level of education	56.7 (52.1 to 61.2)	20.2 (16.4 to 24.0)	11.2 (8.4 to 14.1)	11.9 (8.6 to 15.3)
Medium level of education	61.6 (54.6 to 68.7)	18.9 (13.8 to 24.0)	8.0 (3.9 to 12.1)	11.5 (6.0 to 17.0)
High level of education	61.9 (54.8 to 69.0)	19.3 (13.8 to 24.8)	11.9 (6.9 to 16.8)	7.0 (1.6 to 12.4)

95% CIs in parentheses. Prevalence and CIs were weighted and pooled from 50 multiply imputed datasets. RHS-13 cut-off scores of 11 ('mild'), 18 ('moderate') and 25 ('severe') were used.
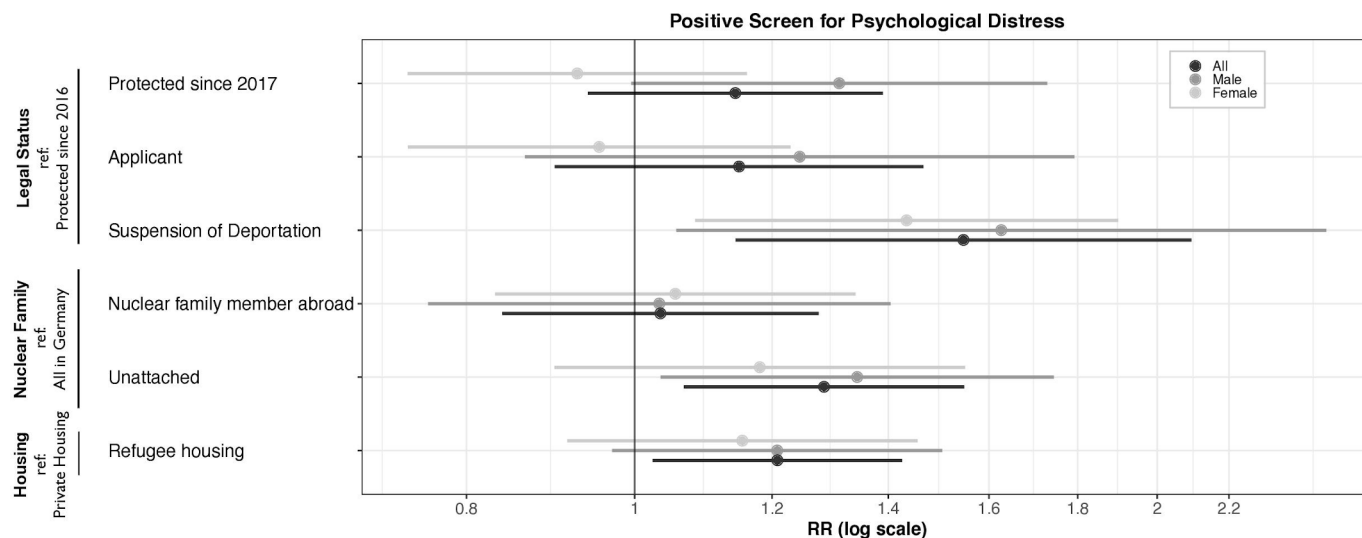
Figure 1 The association between postmigration factors and psychological distress. Risk ratio (RR) estimates and 95% CIs from nine separate modified poisson regression models predicting positive screens for psychological distress (cut-off used: 11 points on the RHS-13) from a) legal status (reference category: 'Protected since 2016'), b) nuclear family situation (reference category: 'All Nuclear Family Members in Germany'; data from 2016, since there was no information on children in second wave), c) housing type (reference category: 'Private Housing'), respectively, stratified and non-stratified by gender, adjusted for gender (when non-stratified), age, nationality, level of education and year of arrival in Germany. For the legal status regression, we omitted the non-significant results for the 'Other' category, whose legal meaning is unknown, for the sake of clarity. Results are pooled from 50 multiply imputed datasets and weighted. For complete regression results, please see online supplementary tables S5.

a risk factor. There also seems to be a trend of lower levels of moderate and severe distress among Eritreans, with a relatively high proportion of Eritreans in the no-distress category (75.2% (66.4% to 83.9%), e.g., compared to 65.0% (61.1% to 68.9%) of Syrians). The levels of distress are equally represented among refugees of different levels of education. Online supplementary table S4 shows the RRs of psychological distress with the 11-point cut-off (mild or greater distress levels) regressed on these sociodemographic factors adjusted for one another.

Postmigration risk factors for psychological distress

Figure 1 shows the RRs of legal status, family constellation and housing as independent variables predicting psychological distress. A highly uncertain legal status, namely, suspension of deportation, is related to an elevated risk of psychological distress (RR=1.55 (1.14 to 2.10)). For males, having been granted a protection status more recently also appears to be linked to greater distress (1.31 (1.00 to 1.73)), albeit with a high level of statistical uncertainty.

Furthermore, males without a spouse or children are at approximately 1.34 (1.04 to 1.74) times higher risk of psychological distress than those refugees who have their nuclear family in Germany. Living in a refugee housing facility is also associated with increased psychological distress (1.21 (1.02 to 1.43)). It is noteworthy that almost all of the effect sizes for postmigration factors are larger for males than for females, though with substantially overlapping confidence intervals. Online supplementary table S shows the numeric regression results plotted in figure 1.

Psychological distress and integration

Figure 2 shows the RRs for those who screened positive on the RHS for three indicators of integration. Values below 1 indicate that psychological distress is associated with reduced chances of integration in the different dimensions. Psychological distress is associated with a substantially reduced probability of being in employment in males (0.67 (0.52 to 0.86)). A lower probability of participating in educational programmes can also be found, especially for females (0.42 (0.17 to 1.01)), although the statistical uncertainty is high in this case. The participation in integration courses is associated with psychological distress to a lesser degree; we find no effect for females and a small association for males (0.90 (0.81 to 0.99)). Online supplementary table S6 shows the numeric regression results plotted in figure 1. Online supplementary table S7 additionally shows unadjusted prevalence of distress (11-point cut-off) per contextual and integration variable subcategory.

DISCUSSION

Our results provide policy-makers with representative estimates of the prevalence of psychological distress related to depression, anxiety and PTSD among refugees who arrived in Germany between 2013 and 2016. Almost half (41.2%) of the population is affected by psychological distress. More than every tenth refugee (10.9%) exhibits severe levels of distress indicative of an urgent need for care. Our study also identified a risk pattern including risk factors such as female gender, older age and Afghan
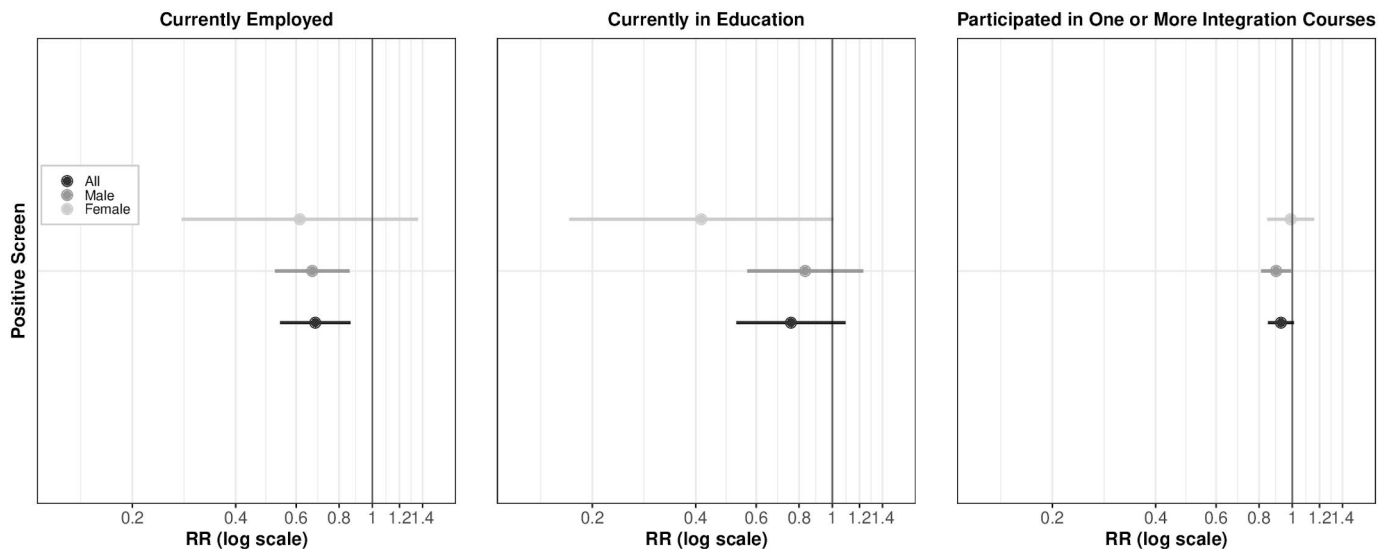
Figure 2 The association between psychological distress and indicators of integration. Risk ratio (RR) estimates and 95% CIs from nine separate modified poisson regression models predicting current employment (binary), currently being in education (binary) and course participation (binary) from psychological distress screening status (reference category: 'Negative Screen', cut-off used: 11 points on the RHS-13), respectively, stratified and non-stratified by gender, adjusted for gender (when non-stratified), age, nationality, level of education and year of arrival in Germany. Results are pooled from 50 multiply imputed datasets and weighted. For complete regression results, please see online supplementary table S6.

nationality. We further found that postmigration factors such as insecure legal status, residing in Germany without a spouse or children and living in refugee housing are associated with psychological distress. Finally, we showed that those male refugees who are distressed are less likely to be employed and participate in integration courses, and that female refugees who are distressed may be less likely to be participating in educational programmes.

Our findings indicate a mental illness burden similar to that established by the only comparable European representative study on Syrian refugees in Sweden,[11] which reports a prevalence of depression and PTSD of 40.2% and 29.9%, respectively. They also lend support to meta-analyses indicating that at least one in three refugees is likely impacted by symptoms of depression, anxiety and/or PTSD.[9][10][37] Our estimates of the prevalence of the different levels of psychological distress defined by Bjärtå and colleagues[31] suggest that the following treatment capacities have to be provided by the German healthcare system: Every tenth refugee is likely in urgent need of care, slightly more than one in ten further refugees is likely to require standard care following further evaluation, and one in five additional refugees have lower levels of distress requiring further assessment that might best be remedied through lower threshold psychosocial interventions.[37][38] For the sake of those in need, it is also imperative to reduce legal limitations to full access to the healthcare system for all asylum seekers, as is the case, for instance, in Austria and Switzerland.[39]

Our findings additionally provide information for a useful stratification of interventions, for example, towards gender-sensitive intervention: females are more often affected by mental health problems than males, particularly by severe levels of distress. This result corroborates many previous studies on refugees[3][4] as well as non-migrant populations.[40] Gender-based violence and discrimination before, during and after flight, limited formal education and pressure from changing gender and family dynamics are likely to contribute to distress among refugee women.[41] In addition, the likelihood of becoming a refugee in the country of origin also varies by gender and could be related to higher ex ante vulnerability among women.

The role of age in refugee mental health is a twofold story in the literature. Some studies, like ours, have found older age to be a risk factor.[11] Many previous studies may not have had a sufficiently large sample size to detect the risk in this minority within most refugee populations. Beyond common risk factors for older populations, such as physical health problems, elevated acculturation stress due to a reduced ability to adapt to a new environment might explain these age effects.[42] On the other hand, the literature emphasises the particular vulnerabilities of (unaccompanied) underage refugees,[43] which could not be examined in our adult sample.

The particular risk of poor mental health among Afghan refugees, especially of moderate and severe levels of distress, is likely related, at least in part, to the uncertainty Afghans have faced in the German asylum process.[44] However, our post hoc analysis including only those granted full refugee status reveals that Afghans with secure statuses are still particularly at risk of distress, indicating that struggles for legal recognition may not be the only explanation. Previous studies have highlighted the prevalence of traumatic experiences among Afghan refugees, having come from a country in severe unrest for over three decades.[42][45]

Regarding postmigration contextual factors, our finding that an insecure legal status is linked to poorer mental health is in keeping with the literature.[13 46 47] Some studies report that the process of seeking asylum could even lead to re-traumatisation or hinder the process of overcoming flight-related trauma.[46 47] In addition to the stress of uncertainty, the reduced access to services and institutions that less secure statuses often entail might underlie this association.[48] Our results furthermore indicate that males who received a protection status more recently may experience greater distress than those who have been protected for longer. This might be due to more prolonged exposure to uncertainty, but perhaps also to stressors associated with the transition into a more permanent residence in the host country. Many with insecure statuses will remain in the host society for long periods of time, so the psychological burden of insecure legal statuses should be carefully considered.[49]

Surprisingly, we did not find a relationship between having a nuclear family member abroad in 2016 and the psychological distress screening score in 2017. Previous studies using the larger first wave of the IAB-BAMF-SOEP survey (2016) did identify family separation as related to other distress measures.[50 51] We do not know whether there are cases in which family members have moved to Germany between 2016 and 2017. A process of adjustment to family separation may also have occurred. Our finding that male refugees without spouses or children exhibit increased distress resonates with studies identifying social isolation as a major risk factor.[47]

We also found an association between greater distress and living in refugee housing facilities, as has been previously shown.[14 15 46] Housing facilities often mean living in crowded quarters with limited privacy, restricted autonomy and isolation from the local community. It may also come with safety concerns in light of the frequency of attacks on refugee accommodation in many host countries, including Germany.[52]

Finally, the associations we found between a positive screen for psychological distress and employment and, to a lesser degree, participation in education and integration courses lend support to the putative harmful effects of poor mental health on integration.[23] The association between unemployment and poor mental health has been reported previously for refugees.[20] Khoo and colleagues[53] have already argued that this association underscores the shortsightedness of failing to prioritise mental health in immigrant and refugee communities. The potential of a vicious cycle between post-migration stressors, poor mental health and difficulties in integration should be taken seriously.[21 24]

Our data do not allow us to explain why many of the associations we observed between mental health and other factors are stronger or only present among male refugees, with the exception of currently being in education, which was only linked to (an absence of) distress in females. In some cases, the statistical power was lower for females due to the smaller number of observations, but in many cases, the effect size for females was smaller and even close to zero. Gender role expectations may render certain circumstances, such as unemployment, more stressful for males.[54] Gender differences in the experience of premigration stressful or traumatic experiences may also relate to differences in the impacts of stressors and functional impairments in the host country.

Limitations

This study's primary limitation is its correlational nature. Due to the survey design, we are unable to draw conclusions about causality or direction of effects. Another caveat is that our mental health measure is a self-report diagnostic proxy, not a diagnostic tool, and does not allow for distinctions between the conditions whose symptoms it comprises. Furthermore, the RHS also has not been validated in all nationalities represented in our sample to ensure cross-cultural validity.[55] While Kaltenbach and colleagues[30] validated the instrument in a general German refugee sample, their study did not examine different major refugee groups separately. The factor structure of the RHS-13 also requires further investigation given our and, for example, Hollifield and colleagues'[29] somewhat ambiguous results. Our study may be underestimating the prevalence of mental ill health because a selection bias favouring those with better mental health is likely to have been at work in the IAB-BAMF-SOEP survey sampling procedure, as is generally to be expected in population-based surveys.[56] Response rates at wave 1 were higher than in the SOEP general German population survey, but drop-out after the first wave was also higher due to the high mobility of the refugee population in the early years after arrival in Germany, introducing the possibility of selectivity and bias that cannot completely be compensated by our use of survey weights. Finally, whether our findings hold for other host countries and other refugee populations is unclear, considering the vast differences in circumstances even between Western European countries. However, Germany is a highly relevant case because it has adopted the largest number of refugees in the European Union.

CONCLUSION

First, a high overall prevalence of psychological distress in the general refugee population in Germany was observed. Second, refugees are not a homogeneous population with respect to risk of psychological distress, and individual and context-specific risk factors can have a large impact on the resilience or vulnerability of individuals. Third, our findings demonstrate the association of distress with markers of integration.

New strategies and concepts for improving the mental health of refugee populations are called for, and associations between post-migration factors in the host society as well as social participation and mental health should play a more prominent role in the development of health and integration policies.

Author affiliations
[1]Department of Psychiatry, Charité Universitätsmedizin Berlin, Berlin, Germany
[2]Sozio-oekonomisches Panel, Deutsches Institut für Wirtschaftsforschung eV, Berlin, Germany
[3]Department of Psychosomatic Medicine and Psychotherapy, Johannes Gutenberg Universität Mainz, Mainz, Rheinland-Pfalz, Germany
[4]Institute of Sociology, Freie Universität Berlin, Berlin, Germany

ORCID iDs
Lena Walther http://orcid.org/0000-0002-2703-5022
Jürgen Schupp http://orcid.org/0000-0001-5273-643X

REFERENCES

1 Hatton TJ. Refugees and asylum seekers, the crisis in Europe and the future of policy. *Econ Policy* 2017;32:447–96.
2 Bundesministerium des Inneren (BMI). *890.000 Asylsuchende Im Jahr 2015. Pressemitteilungvom 30.9*. BMI, 2016.
3 Fazel M, Wheeler J, Danesh J. Prevalence of serious mental disorder in 7000 refugees resettled in Western countries: a systematic review. *Lancet* 2005;365:1309–14.
4 Porter M, Haslam N. Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: a meta-analysis. *JAMA* 2005;294:602–12.
5 Steel Z, Chey T, Silove D, *et al*. Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *JAMA* 2009;302:537–49.
6 Bogic M, Njoku A, Priebe S. Long-Term mental health of war-refugees: a systematic literature review. *BMC Int Health Hum Rights* 2015;15:29.
7 Ager A, Strang A. Understanding integration: a conceptual framework. *J Refug Stud* 2008;21:166–91.
8 Morina N, Akhtar A, Barth J, *et al*. Psychiatric disorders in refugees and internally displaced persons after forced displacement: a systematic review. *Front Psychiatry* 2018;9:433.
9 Turrini G, Purgato M, Ballette F, *et al*. Common mental disorders in asylum seekers and refugees: umbrella review of prevalence and intervention studies. *Int J Ment Health Syst* 2017;11:51.
10 Lindert J, von Ehrenstein OS, Wehrwein A, *et al*. [Anxiety, Depression and Posttraumatic Stress Disorder in Refugees - A Systematic Review]. *Psychother Psychosom Med Psychol* 2018;68:22–9.
11 Tinghög P, Malm A, Arwidson C, *et al*. Prevalence of mental ill health, traumas and postmigration stress among refugees from Syria resettled in Sweden after 2011: a population-based survey. *BMJ Open* 2017;7:e018899.
12 Chen W, Hall BJ, Ling L, *et al*. Pre-migration and post-migration factors associated with mental health in humanitarian migrants in Australia and the moderation effect of post-migration stressors: findings from the first wave data of the BNLA cohort study. *Lancet Psychiatry* 2017;4:218–29.
13 Georgiadou E, Zbidat A, Schmitt GM, *et al*. Prevalence of mental distress among Syrian refugees with residence permission in Germany: a registry-based study. *Front Psychiatry* 2018;9:393.
14 Leiler A, Bjärtå A, Ekdahl J, *et al*. Mental health and quality of life among asylum seekers and refugees living in refugee housing facilities in Sweden. *Soc Psychiatry Psychiatr Epidemiol* 2019;54:543–51.
15 Agbih S. Housing facilities for asylum seekers in Germany: ethical concerns regarding social exclusion, othering and negative effects on health. *Eur J Public Health* 2019;29:185–174.
16 Miller A, Hess JM, Bybee D, *et al*. Understanding the mental health consequences of family separation for refugees: implications for policy and practice. *Am J Orthopsychiatry* 2018;88:26–37.
17 Kirchhoff M, Lorenz D. Between illegalization, toleration, and recognition: Contested asylum and deportation policies in Germany. In: Rosenberger S, Stern V, Merhaut N, eds. *Protest movements in asylum and deportation*. . Cham:Springer, 2018: 2918. 49–68.
18 Grote J. *Family reunification of Third-country Nationals in Germany: focussed study by the German national contact point for Europen migration network (EMN*. Federal Office for Migration and Refugees, 2017.
19 Schmid V, Kück S. Access to housing in Germany. In: Korntheuer A, Pritchard P, Maehler DB, eds. *Structural context of refugee integration in Canada and Germany*. Köln: GESIS Leibniz Institute for Social Sciences, 2017: 119–26.
20 Wright AM, Dhalimi A, Lumley MA, *et al*. Unemployment in Iraqi refugees: the interaction of pre and post-displacement trauma. *Scand J Psychol* 2016;57:564–70.
21 Bakker L, Dagevos J, Engbersen G. The importance of resources and security in the socio-economic integration of refugees. A study on the impact of length of stay in asylum accommodation and residence status on socio-economic integration for the four largest refugee groups in the Netherlands. *J Int Migr Integr* 2014;15:431–48.
22 Prem M. Access to Resettlement Services in Germany. In: Korntheuer A, Pritchard P, Maehler DB, eds. *Structural context of refugee integration in Canada and Germany*. Köln: GESIS Leibniz Institute for Social Sciences, 2017: 119–26.
23 Beiser M, Goodwill AM, Albanese P, *et al*. Predictors of the integration of Sri Lankan Tamil refugees in Canada: pre-migration adversity, mental health, personal attributes, and post-migration experience. *Int J Migr Health Soc Care* 2015;11:29–44.
24 Schick M, Zumwald A, Knöpfli B, *et al*. Challenging future, challenging past: the relationship of social integration and psychological impairment in traumatized refugees. *Eur J Psychotraumatol* 2016;7:28057.
25 OECD. Finding their Way: Labour Market Integration of Refugees in Germany', 2017. Available: https://www.oecd.org/els/mig/Finding-their-Way-Germany.pdf [Accessed 21 Dec 2019].
26 Kühne S, Jacobsen J, Kroh M. Sampling in times of high immigration: the survey process of the IAB-BAMF-SOEP survey of refugees. In: *Survey methods*. Insights from the Field, 2019.
27 Kroh M, Kühne S, Jacobsen J, *et al*. *Sampling, nonresponse, and integrated weighting of the 2016 IAB-BAMF-SOEP survey of refugees (M3/M4) – revised version.Report No: 477*. Berlin: DIW Berlin, 2017: 1–34. https://www.diw.de/documents/publikationen/73/diw_01.c.572346.de/diw_ssp0477.pdf
28 Hollifield M, Verbillis-Kolp S, Farmer B, *et al*. The refugee health Screener-15 (RHS-15): development and validation of an instrument for anxiety, depression, and PTSD in refugees. *Gen Hosp Psychiatry* 2013;35:202–9.
29 Hollifield M, Toolson EC, Verbillis-Kolp S, *et al*. Effective screening for emotional distress in refugees: the refugee health screener. *J Nerv Ment Dis* 2016;204:247–53.
30 Kaltenbach E, Härdtner E, Hermenau K, *et al*. Efficient identification of mental health problems in refugees in Germany: the refugee health screener. *Eur J Psychotraumatol* 2017;8:1389205.
31 Bjärtå A, Leiler A, Ekdahl J, *et al*. Assessing severity of psychological distress among refugees with the refugee health screener, 13-Item version. *J Nerv Ment Dis* 2018;206:834–9.
32 Lumley T. Analysis of complex survey samples. *J Stat Softw* 2004;9:1–19.
33 Buuren Svan, Groothuis-Oudshoorn K. mice : Multivariate Imputation by Chained Equations in *R*. *J Stat Softw* 2011;45:1–68.
34 Rubin DB. *Multiple imputation for nonresponse in surveys*. New York: John Wiley and Sons, 1987.

35 Chen W, Qian L, Shi J, *et al*. Comparing performance between log-binomial and robust poisson regression models for estimating risk ratios under model misspecification. *BMC Med Res Methodol* 2018;18:63.

36 Greenland S, Thomas DC. On the need for the rare disease assumption in case-control studies. *Am J Epidemiol* 1982;116:547–53.

37 Nationale Akademie der Wissenschaften Leopoldina. Traumatisierte Flüchtlinge–schnelle Hilfe ist jetzt nötig. Halle, saale: Deutsche Akademie Der Naturforscher Leopoldina e.V., 2018. Available: https://www.leopoldina.org/uploads/tx_leopublication/2018_Stellungnahme_traumatisierte_Fluechtlinge.pdf

38 Böge K, Karnouk C, Hahn E, *et al*. Mental health in refugees and asylum seekers (MEHIRA): study design and methodology of a prospective multicentre randomized controlled TRAIL investigating the effects of a stepped and collaborative care model. *Eur Arch Psychiatry Clin Neurosci* 2020;270:95–106.

39 Bozorgmehr K, Razum O. Effect of restricting access to health care on health expenditures among Asylum-Seekers and refugees: a quasi-experimental study in Germany, 1994-2013. *PLoS One* 2015;10:e0131483.

40 Alonso J, Angermeyer JM, Bernert S, *et al*. Prevalence of mental disorders in Europe: results from the European study of the epidemiology of mental disorders (ESEMeD) project. *Acta Psychiatr Scand* 2004;109:21–7.

41 Deacon Z, Sullivan C. Responding to the complex and gendered needs of refugee women. *Affilia* 2009;24:272–84.

42 Alemi Q, James S, Siddiq H, *et al*. Correlates and predictors of psychological distress among Afghan refugees in San Diego County. *Int J Cult Ment Health* 2015;8:274–88.

43 Rücker S, Büttner P, Lambertz B, *et al*. Resilient Oder Risikogruppe? Psychische Belastungen bei unbegleiteten minderjährigen Ausländern (umA) in Deutschland. *Z Kinder-Jugendpsychiat* 2017;66:242–58.

44 Sökefeld M. Nations rebound: German politics of Deporting Afghans. *International Quarterly for Asian Studies* 2019;50:91–118.

45 Slewa-Younan S, Guajardo MGU, Yaser A, *et al*. Causes of and risk factors for posttraumatic stress disorder: the beliefs of Iraqi and Afghan refugees resettled in Australia. *Int J Ment Health Syst* 2017;11:4.

46 Li SSY, Liddell BJ, Nickerson A. The relationship between post-migration stress and psychological disorders in refugees and asylum seekers. *Curr Psychiatry Rep* 2016;18:82.

47 Hynie M. The social determinants of refugee mental health in the post-migration context: a critical review. *Can J Psychiatry* 2018;63:297–303.

48 Nickerson A, Steel Z, Bryant R, *et al*. Change in visa status amongst Mandaean refugees: relationship to psychological symptoms and living difficulties. *Psychiatry Res* 2011;187:267–74.

49 Kiziak T, Sixtus S, Klingholz R. *Von individuellen und institutionellen Hürden: Der Lange Weg Zur Arbeitsmarktintegration von Geflüchteten. Berlin-Institut für Bevölkerung und Entwicklung*, 2019. ISBN: 978-3-946332-47-3.

50 Löbel LM. Family separation and refugee mental health–A network perspective. *Soc Networks* 2019.

51 Walther L, Fuchs LM, Schupp J, *et al*. Living conditions and the mental health and well-being of refugees: evidence from a large-scale German survey. *J Immigr Minor Health* 2020;24

52 Jäckle S, König PD. The dark side of the German 'welcome culture': investigating the causes behind attacks on refugees in 2015. *West Eur Polit* 2017;40:223–51.

53 Khoo S-E. Health and Humanitarian Migrants' Economic Participation. *J Immigr Minor Health* 2010;12:327–39.

54 Vitale A, Ryde J. Promoting male refugees' mental health after they have been granted leave to remain (refugee status). *Int J Ment Health Promot* 2016;18:106–25.

55 Tibubos AN, Kröger H. A cross-cultural comparison of the ultrabrief mental health screeners PHQ-4 and SF-12 in Germany. *Psychol Assess* 2020;32:690–7.

56 Lundberg I, Damström Thakker K, Hällström T, *et al*. Determinants of non-participation, and the effects of non-participation on potential cause-effect relationships, in the part study on mental disorders. *Soc Psychiatry Psychiatr Epidemiol* 2005;40:475–83.