Urban-rural differences in the occurrence of female depressive disorder in Europe
Evidence from the ODIN study

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Abstract Background In an earlier paper of the European multi-centre ODIN study (Ayuso-Mateos et al. 2001) we found remarkable urban preponderance in comparison to the corresponding rural site in the female prevalence of depressive disorder in the UK and Ireland. The aim of this paper is to analyse the possible reasons for this finding. Method A representative sample of 12,702 people aged between 18 and 64 residing in specified urban and rural areas were screened by the Beck Depression Inventory (BDI) for depressive disorder in four European countries (Finland, Ireland, Norway and the UK). Those over cut-off (BDI score < 12) and a 5% random sample of those under cut-off underwent diagnostic interview including the SCAN version 2.0, and completed a battery of additional research instruments. Results The estimated 1-month prevalence of depressive disorder according to ICD-10 was 9% in the total ODIN sample. A large between-country variation was found in female urban prevalence, with Ireland (Dublin) and the UK (Liverpool) having a remarkably high rate. The women in these same countries showed a significant urban/rural difference, whereas in men and in the total sample this difference was non-significant. Logistic regression analysis including some selected risk factors of depression showed still higher risk of depressive disorder both in Dublin and Liverpool compared with the Finnish urban site (Turku), which had the lowest urban prevalence. In addition, also such factors as lack of confidant and having difficulties in getting practical help from neighbours were important predictors of depressive disorder. Similarly, when analysing the different countries separately, the significance of the urban/rural difference in women remained for Ireland and the UK, indicating that the other risk factors studied could not totally explain the difference. Conclusions ODIN is the first European study on occurrence of depressive disorder in both urban and rural settings allowing closer analysis of the urban/rural differences. The most striking result was the large urban/rural difference in women in the two countries from the British Isles which could not be totally explained by the socio-demographic factors included in this study.

Key words occurrence – depressive disorders – women – urban-rural differences – European perspective

Introduction

Previous studies comparing depression in rural and urban areas in Europe have produced intriguing findings (Väisänen 1975; Brown and Prudo 1981; Sievewright et
al. 1991; Madianos and Stefanis 1992; Gaminde et al. 1993; Lehtinen and Joukamaa 1994; Meltzer et al. 1995; Bijl et al. 1998). Most of the studies have shown higher prevalence especially in large cities in comparison to rural environments, but otherwise the findings are by no means unanimous. However, adequate assessment of the impact of living environment upon depressive disorder requires a carefully designed, comparative European study taking into account other determinants of depressive disorder. The Outcome of Depression International Network (ODIN) study was designed to meet these requirements (Dowrick et al. 1998).

In an earlier paper from the ODIN study (Ayuso-Mateos et al. 2001), we found large urban/rural differences in prevalence of depressive disorder in the two countries from the British Isles (UK and Ireland), but the same was not evident in the two participating Nordic countries (Finland and Norway). There were also remarkable differences between the urban study sites which were, however, not apparent between the rural study sites. As foreseen in this earlier paper, we will now analyse in more detail whether some selected determinants, associated with the occurrence of depressive disorder, could explain the large urban/rural difference found in the UK and Ireland.

### Subjects and methods

#### Selection of study sites

Originally, five European countries, Finland, Ireland, Norway, Spain and the United Kingdom, participated in the ODIN project. The identification of the ODIN study sites has been described in detail elsewhere (Dowrick et al. 1998, 1999). Each centre, with the exception of Spain, selected one urban and one rural site in which to conduct the research. As Spain had only an urban site, it was excluded from the analyses of this particular paper. The urban sites divide into three large cities (Dublin, Liverpool and Oslo) and one medium-sized town (Turku). Rural areas were defined as having no centre of population greater than 15,000 people and at least 20% of the economically active population being employed within occupations directly related to agriculture, forestry or fishing. This was informed by previous definitions of rurality (Hewitt 1989; Rousseau 1995). In Finland the rural site encompassed the three adjacent municipalities of Marttila, Koski and Tarvasjoki; in Ireland it was the county of Laois, in Norway the municipality of Rakkestad, and the British rural site was the former Glynwyr district in North Wales.

#### Sampling frame

The primary survey population consisted of adults aged between 18 and 64, identified either via population registers (Finland and Norway) or lists of patients registered with primary care physicians (Ireland and UK). The probability samples of these countries totalled 12,702, varying from 461 in rural Ireland to 2,464 in rural Norway.

#### Study design and methods

The ODIN project was a two-phase epidemiological population survey (Dowrick et al. 1998). An overall response rate of 63% (N = 7,612) was achieved for the first phase of the project, when those who had moved or died were excluded. A total of 1,031 participants underwent diagnostic interview during the second phase of the study, with an overall response rate of 72%. For the screening phase of the study, the response rate was significantly higher in rural than in urban UK (p < 0.001), but for the other countries there was no urban/rural difference in this respect. Concerning the response rates of the second phase, there were no significant urban/rural differences (Ayuso-Mateos et al. 2001).

The first (screening) phase of the study, conducted by postal questionnaire, identified possible cases of depressive disorder using a self-report instrument, the 21-item Beck Depression Inventory (BDI) (Beck et al. 1961), with a cut-off score of 13 or above (Nielsen and Williams 1980; Lasa et al. 2000). This phase also incorporated questions concerning demographic characteristics and short measures of social support (Brevik and Dalgaard 1996) and recent life events (Brugha et al. 1985). Study instruments were available in the language of the participant. Non-responders were contacted up to three times by post and/or telephone.

In the second phase of the study, all BDI-positive respondents and a 5% random sample of the BDI-negative respondents were invited to a diagnostic interview with a trained mental health research worker. The SCAN version 2.0 interview (World Health Organisation 1994), collecting diagnostic information from the previous 4 weeks, was used to achieve diagnoses of depressive disorders according to ICD-10 and DSM-IV categories. For ICD-10, as used in this paper, the diagnostic categories included single and recurrent depressive episodes (F32, F33), bipolar and persistent affective disorders (F31, F34), and adjustment disorder with a depressive component (F43.2). As shown in an earlier paper, the weighted prevalence was almost identical using either DSM-IV or ICD-10 classification in this study (Ayuso-Mateos et al. 2001).

#### Statistical analysis

For analyses of the different determinants of depressive disorder, which were all collected in the screening phase of the study, simple cross-tabulations with chi-squared tests were used. Weighted prevalence estimates, taking into account the two-phase sampling strategy, were obtained by STATA, version 6, statistical package using the svyprop and logit commands as described by Dunn (2000). For multivariate analyses, logistic regression analyses with a 95% confidence interval were conducted.

#### Results

#### Prevalence estimates of depressive disorder

As the prevalence figures have been presented in our earlier paper (Ayuso-Mateos et al. 2001), we give here only a very short overview of the main results. The estimated overall 1-month prevalence of depressive disorder according to ICD-10 criteria was 9% in the total ODIN sample, 10.2% in the urban sites combined, and 7.5% in the four rural sites combined; in the total sample the urban/rural difference was non-significant (design-based F = 2.3414; p = 0.1263). When analysing by gender, it resulted that the urban/rural difference was evident in women (12.3% vs. 8%; design-based F = 2.8933; p = 0.0894) but not in men (7.2% vs. 7.1%; n.s.).

In a still closer analysis by country, it could be shown that the female urban preponderance concerned only the UK (22.6% vs. 6.2%; design-based F = 9.4336; p = 0.0024) and Ireland (32.7% vs. 5.8%; design-based F = 7.1989; p = 0.0097) but not Finland (7.4% vs. 8.7%; n.s.) or Norway (11.6% vs. 10.1%; n.s.). This means that