

Urban-rural Differences in Psychotropic Drug Prescribing in Northern Italy

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Summary. Urban-rural differences in psychotropic drug prescribing were examined by comparing data from general practices in two contrasting areas of northern Italy. Patients attending the urban doctors were 1.5 times more likely to be prescribed a psychotropic drug than their rural counterparts. We also explored urban-rural differences in factors influencing psychotropic prescribing. Such influences were more numerous and complex in the urban than the rural setting.

Key words: General practice – Psychotropic drug – Urban-rural

Introduction

The prescription and consumption of psychotropic drugs in the community is an important topic for research. However this has been evaluated to a widely different extent in different countries. Much research has been conducted in English-speaking countries as well as in Scandinavia, while less information is available from countries of mainland Europe, including Italy [1–2]. The Department of Medical Psychology at the University of Verona has recently embarked on a series of studies to investigate aspects of psychotropic drug use in Italy. To date, four studies have been completed. These are a community study of self-reported psychotropic drug consumption [3], an analysis of national and regional trends in prescribing based on sales data [4], and two studies on psychotropic drug prescribing in general practice settings [5, 6].

One aspect of psychotropic drug use that has received some attention is the influence of location on the urban-rural continuum: in general, studies have shown more drug use in urban than in rural settings [7]. An important limitation of many of the studies is that they are based on aggregated data, so that the results largely consist of ecological level correlations. The problems of drawing individual level inferences from such findings are well-known [8], so that there is a need for studies in which the unit of measurement is an individual: such a study is reported here. A previous report [6] was concerned with psychotropic drug prescribing in general practice in Verona, an urban area of northern Italy. In this paper data collected in the same way in general practices in Chiavenna, a rural area of northern Italy, are presented and compared with the results of Fiorio et al. [6], so that urban-rural differences in the extent of, and influences on psychotropic drug prescribing can be explored.

Method

Three single-handed general practitioners (GPs) in Verona and three in Chiavenna took part in the study. The former is an industrial and commercial city of 270,000 inhabitants in the Veneto region, with a population density of 1336/km². The latter is a rural town of approximately 3,000 inhabitants, situated in the Valchiavenna area of Lombardia, of which the population density, according to the 1983 Census, was 0.4/km². In 1978 a new psychiatric reform was approved by the Italian Parliament. According to this reform first admissions to mental hospitals were blocked from May 1978 and all admissions to these institutions forbidden since January 1982. Community-based services were set up to provide the full range of psychiatric interventions for geographically delimited areas, including hospital care which is provided by general hospital psychiatric units [9]. The organization of psychiatric services is similar in Chiavenna and Verona, however the latter offers a wider

range of psychiatric facilities. Mental hospitals, where only old long-stay inpatients continue to reside, are situated 15 and 9 miles from Chiavenna and Verona, respectively. The data collection has been described in detail by Fiorio et al. [6], and, in brief, information was collected from all consecutive attenders at the six practices during a 2-week period in March 1986. The GPs completed a schedule (GP Recording Schedule) for each patient, providing demographic data and information about psychiatric morbidity, physical illness, social problems, and the drugs prescribed. Conspicuous psychiatric morbidity was rated according to the scale devised by Goldberg and Blackwell [10] and drugs were classified according to the scheme used by Bellantuono et al. [5–11], Siciliani et al. [3] and Martini et al. [12]. The category of psychotropic included benzodiazepines, antidepressants, neuroleptics, lithium, and other drugs acting on the CNS (barbiturates, stimulants).

Results

In total 275 patients were seen by the Verona GPs during the study period. Of those, 165 were women and 110 were men. A psychotropic drug was prescribed for 39 (24%) of the women and 25 (23%) of the men, a clearly trivial difference. Benzodiazepines accounted for 74% of all psychotropics prescribed, followed by antidepressants (17%), and neuroleptics (9%). In Chiavenna 455 patients were seen by GPs during the study period: 195 of the patients were men and 260 women. A psychotropic drug was prescribed for 68 (15%) of them. Significantly more women than men received a prescription (19% as compared with 10%, $\chi^2 = 5.90$, $P < 0.05$). Benzodiazepines accounted for 88% of all psychotropics, antidepressants for 8%, and neuroleptics for 4%. The influence on psychotropic drug prescribing of age, marital status, occupational status (employed, not employed) and educational level (<8 years, >8 years of full time education) was explored, and none of the associations were significant. The relationships between psychotropic prescribing and three health-related variables recorded by the GPs are shown in Table 1. It can be seen that

each variable was strongly and significantly related to prescribing in men and in women.

Comparison between Chiavenna and Verona

The attenders at the rural practices (in Chiavenna) were compared with those at the urban practices (in Verona – Fiorio et al. [6]) with regard to five socio-demographic- and three health-related variables. There were no significant differences with regard to sex, age, marital status, and employment status. However, significantly fewer of the rural patients have had more than 8 years of full time education (15% and 21% respectively, $\chi^2 = 5.27$, $P < 0.05$). Significantly fewer of the male attenders at Chiavenna were regarded as having a psychiatric problem (14% and 28% respectively, $\chi^2 = 9.06$, $P < 0.001$), and the same was true for social problems (23% and 34% respectively, $\chi^2 = 3.96$, $P < 0.05$). However, there were no differences for the women, and no urban-rural difference for the identification of physical health problems in patients of either sex. Virtually all the patients in both settings received prescriptions for nonpsychotropic drugs: the average number of such drugs prescribed per patient was 0.94 in the urban and 0.96 in the rural setting – i.e., no difference. As mentioned previously, 15% of the patients in Chiavenna were prescribed a psychotropic drug, as compared with 23% of the Verona patients [6]. This urban-rural difference was significant at the 1% level ($\chi^2 = 7.51$). The urban-rural difference in psychotropic drug prescribing was greater for the men than for the women, although not significantly so.

Fiorio et al. [6] investigated the joint influence of the sociodemographic- and health-related variables on prescribing in the Verona practices by means of linear logistic modelling. Four effects were included in their model of best fit: these were independent effects of educational level (more prescribing in the

Table 1. The influence of health-related variables on psychotropic drug prescribing in rural practices (Chiavenna)

	Men		Women	
	Number and percentage receiving a psychotropic prescription	χ^2 , 1 df, P	Number and percentage receiving a psychotropic prescription	χ^2 , 1 df, P
Conspicuous psychiatric morbidity	Present 18/27 = 67% Absent 2/168 = 1%	108.34, < 0.0001	Present 47/75 = 63% Absent 1/185 = 1%	136.82, < 0.0001
Social problems	Present 12/45 = 27% Absent 8/150 = 5%	17.16, < 0.001	Present 36/90 = 40% Absent 12/170 = 7%	48.42, < 0.0001
Physical ill-health	Present 16/181 = 9% Absent 4/14 = 29%	5.50, < 0.05	Present 29/216 = 13% Absent 19/44 = 43%	21.50, < 0.001

Table 2. Urban-rural differences in factors influencing psychotropic drug prescribing

Interaction between urban-rural location and:	Difference in G^2 (1 <i>df</i>), <i>P</i>
Physical ill-health	0.04, NS
Educational level	8.19, < 0.01
Sex and conspicuous psychiatric morbidity interaction	5.88, < 0.05
Sex and social problem interaction	12.99, < 0.001

better educated) and physical ill-health (more prescribing in the physically healthy), and interactive effects between sex and conspicuous psychiatric morbidity (the effect of morbidity on prescribing being greater in men) and between sex and social problems (the effect of social problems on prescribing being greater in women).

In order to investigate urban-rural differences in factors influencing psychotropic drug prescribing, we conducted an identical modelling procedure on the Chiavenna data. This was done using the GLIM package [13]. The results were very different: the only significant effect to emerge was that of conspicuous psychiatric morbidity (difference in $G^2 = 215.60$, 1 *df*, $P < 0.0001$).

The Chiavenna and Verona data were combined into a single dataset, with the addition of a variable to indicate their origin. Then, the model of best fit obtained by Fiorio et al. [6] for the Verona data was applied to the combined dataset. Then, a model of the following form was fitted: Verona model + UR + UR* (Verona model), where UR was a dummy variable indicating urban-rural location. The difference in the goodness of fit between the two models was a measure of the statistical significance of the urban-rural difference in factors influencing psychotropic drug prescription in the general practices. The difference in G^2 was 40.40, which, with 8 *df*, was significant at the 0.1% level.

Finally, this was explored further by assessing the significance of the interaction between the urban-rural dummy variable and each of the four terms in the best fit model of Fiorio et al. [6] for prescribing in Verona. Table 2 shows that three of these terms were statistically significant, indicating an urban-rural difference in their influence on psychotropic drug prescribing.

Discussion

When considering these results, it must be remembered that the data were derived from a small, and

possibly atypical, sample of GPs in each of the two areas. However there are no a priori reasons for regarding the participating GPs as atypical prescribers, at least in such a way as to bias the urban-rural differences. Thus, despite the small number of doctors, we believe the results to be of interest. The central finding was that patients in the urban practices were 1.5 times more likely to be prescribed a psychotropic drug than patients in the rural practices. While this urban-rural difference confirms previous reports, we found it to be specific for psychotropic (as opposed to nonpsychotropic) drugs, in contrast to the finding of Webb and Collette [14] and Gabe and Williams [7]. With regard to urban-rural differences in psychotropic drug use, Webb and Collette [14] used pharmacy data to investigate rates of psychotropic drug use in localities of different size in New Zealand. They found that the larger the locality, the lower the means monthly rate of prescriptions.

In response, Crothers [15] argued that the findings were an artifact of the method of analysis, since Webb and Collette [14] had utilized community boundaries which excluded the rural hinterland served by urban centers. Crothers [15] recalculated prescribing rates for communities plus their hinterlands using a simulation technique, and found that they varied directly, rather than inversely, with population size. In response, Webb and Collette [16] reanalyzed their data in the way suggested by Crothers [15] and found, in contrast to their previous conclusions, that psychotropic prescribing did indeed vary directly with the size of the locality. Subsequently Norton and Klein [17] studied psychotropic prescribing rates in a number of isolated rural Canadian communities. They found an inverse relationship between population size and prescribing if the community population alone was taken as the unit of analysis, and a direct relationship if communities together with their hinterlands were used. They argued that the smaller the community, the greater the impact of the hinterland.

All these studies have used community population size as the measure of the urban-rural continuum. Since the boundaries of communities are to a great extent decided on the basis of administrative considerations, it may be more appropriate to use a measure of population related to area, that is, population density. King et al. [18] found that minor tranquilizers and hypnotic prescribing was significantly higher in urban areas. Population density was the first variable in the hierarchical regression model to explain tranquilizer prescribing (accounting for 31.7% of the variance). Gabe and Williams [7] compared tranquilizer prescribing in general practices located in areas of England designated as urban or rural on the basis of population density: they found higher rates

in the urban areas, a difference which could not be explained by urban-rural differences in the GPs workload.

Urban-rural differences in psychotropic drug sales in Italy were investigated by Williams et al. [4]. Using an ecological regression approach (with regions as the unit of analysis), they found that tranquilizer sales were positively related to population density and to a measure of community size within the regions. As well as confirming these findings, the present study allows the urban-rural difference in psychotropic drug prescribing to be explored in greater depth, since the present data relate to individual patients. Thus, we have been able to investigate urban-rural differences in influences on prescribing. Fiorio et al. [6] considered the influences on psychotropic drug prescribing in the urban practices studied here. In brief they found four significant influences: independent effects of educational level and physical ill-health, and interactive effects between sex and conspicuous psychiatric morbidity, and between sex and social problems. We used an identical modelling technique to investigate influences on psychotropic prescribing in Chiavenna. The results were in sharp contrast: the only significant factor was an independent effect of conspicuous psychiatric morbidity. Thus, there is by implication an urban-rural difference in the factors which influence psychotropic prescribing. We tested this formally by examining interactions between an urban-rural dummy variable and the terms in the Fiorio et al. [6] model for urban prescribing. Three of these four interactions were significant.

There are two important implications from these findings. First, the urban-rural difference in psychotropic prescribing is not explained solely by urban-rural differences in conspicuous psychiatric morbidity. Rather, there are differences in the way in which such morbidity influences prescribing (independently in the rural area, interacting with sex in the urban area). The same is true for social problems. Second, the influences on psychotropic drug prescribing are clearly more complex in the urban setting – two sociodemographic – and three health-related variables are involved in four significant effects. In sharp contrast, the rural model consists only of the simple, strong effect of conspicuous psychiatric morbidity (this finding gives a new interpretation to the notion of rural simplicity). Clearly results such as these need to be replicated on larger samples of patients and doctors. Such a study is currently underway.

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