

# Gender Differences in the Prevalence and Correlates of Psychotropic Medication Use among Older Adults in Israel

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## ABSTRACT

**Background:** This study evaluates gender differences in the prevalence of psychotropic medications use among elderly Israelis and the socio-demographic, physical and mental health correlates of their use.

**Method:** Data were taken from a national survey that sampled the community-dwelling Jewish population aged 65-94 in Israel. Psychotropic medications were assessed from the list of all medications recorded during a face-to-face interview. The current analysis focused on three medication groups: anxiolytics, sedatives/hypnotics and antidepressants.

**Results:** A significantly higher use of anxiolytics was observed among women compared to men after taking into account their worse physical and mental health. Age, not being married, sleeping problems and depressive symptoms were significant correlates among men while number of non-psychotropic medications, any life trauma and being married correlated with use of anxiolytics and sedatives/hypnotics among women. The use of antidepressants was low in men and women and was related mainly to disability in ADL.

**Conclusions:** This study points to possibly over-prescribing of anxiolytics among women and low detection and treatment of depression among the elderly in general.

## INTRODUCTION

The proportion of the population aged 65 years and over in Israel, estimated around 10.0% in 2011, has remained steady since 1995, and is expected to grow to 14.6% by 2035 (1). People in this age group are high users of prescription and nonprescription medications because of increasing levels of chronic comorbidities (2, 3). Consequently, this increase includes higher use of psychotropic medications as compared to younger age groups (4). An Israeli national health survey conducted in 2003-2004 showed that 6.9% of the adult population (over the age 20) report using psychotropic drugs; this rate increased to 12.6% for age group 60-69, and 22.9% for age 70 and over (5). Similar findings were published by another Israeli community study of older adults aged 75-94, where rates increased from 24% in the early 1990s to 28% in the early 2000s (6).

The literature reports potentially adverse consequences in the long-term use of benzodiazepines, which is the main ingredient in most sedative, hypnotic and anti-anxiety medications. Recently, among older people with dementia, use of central nervous system medications was linked to a high number of drug-related problems such as syncope, fatigue, delirium, falls and fractures (7). Other adverse consequences among the general older population include reduced cognitive function (8, 9), increased risk of falls (10) leading to hip-fractures (11, 12), increased depressed affect (13) and lower subjective and objective sleep quality (14).

Cross-sectional comparisons of use of psychotropic medications consistently showed a higher use of psychotropic medications among women in all adult age groups (15, 16), among old and old-old people (17-19) and across

numerous countries (20). Similar results were observed in studies focusing on the use of benzodiazepines in the general population (21) and in older age groups (22). Findings were less consistent when specific classes of medications were analyzed. In several studies the gender gap was shown for anti-anxiety agents and sedative/hypnotics combined (17,18, 23). In another study of older adults, women had a significantly higher risk of using all psychotropic, antidepressant and anti-anxiety drugs, but use of sedatives was not significantly different across gender (24). These findings were shown after taking into account gender differences in sociodemographics as well as physical and mental health measures.

The current study aimed to evaluate gender differences in the prevalence of psychotropic medications in community dwelling adults aged 65-94, and to compare factors associated with psychotropic medications use among elderly women and men.

## METHODS

### PARTICIPANTS AND PROCEDURE

The sample used for this research was the Israeli Multidisciplinary Aging Study (IMAS). The IMAS conducted a multidimensional assessment of a random sample of the older Jewish population in Israel stratified by age group (65-69, 70-74, 75-79, 80-84, 85-89, 90-94), gender, and place of birth (Israel, the Middle East or North Africa, and Europe or America). The sample was drawn from the National Population Registry (NPR) in December 1999. Out of 1,757 sampled individuals, 825 individuals were fully interviewed during 2000-2002 (15.1% were not located, 32.3% refused, and 5.7% could not be fully interviewed): 721 (87%) in person and 104 (13%) by proxy. Proxy interviews were not included in the current study because cognitive and emotional correlates of medication use were not assessed for proxy interviewees. Thus, the current study included all participants living in the community at the time of the baseline interview and personally interviewed (n=721).

The study was approved by the Institutional Review Board of the Sheba Medical Center and all participants signed an informed consent form before the interview. A description of the IMAS study design and results have been published elsewhere (6, 25).

### MEASURES

*Psychotropic medications* were assessed from the list of all medications recorded by the interviewer. Interviewees were asked if they were currently taking prescribed or

self-prescribed drugs for a specified list of medical conditions (heart disease, hypertension, diabetes, kidney disease, sleeping difficulties, depression, etc.). They were requested to display the containers of all medications they were taking, and the name, frequency, and duration of use were recorded. A coding system was developed whereby each drug was given a four digit code: the first two digits represented the therapeutic class according to the classification by the Monthly Ethical Drug Indexed Compilation (26) (a bi-monthly publication of all products according to their indications), and the next two served for assigning a number for every drug in the group.

For the purpose of the present analysis, a clinician reviewed only drugs in the following CNS therapeutic groups, namely, hypnotics and sedatives, tranquilizers and antidepressants (as classified in the original coding system described above), and the generic name was retrieved through the Medic and converted into the Anatomical Therapeutic and Chemical (ATC) classification system (27). A detailed description of the original coding system and the process of conversion to ATC categories have been published in a previous paper devoted to a comparison of psychotropic medication use between two cohorts, 1989 vs. 1999 (6).

Variables from three domains of interest were examined as correlates of use of psychotropic medications: sociodemographic characteristics, physical health and functioning, and mental health and life events indicators.

*Socio-demographic variables* included age, gender, place of birth (born in Israel, Asia-Africa, Europe-America), education (number of school years), marital status (married versus currently unmarried), income (having only a National Insurance pension versus additional income resources), and religiousness (self-defined as religious, traditional, or secular).

Physical health and functioning variables included:

*Number of diseases* (comorbidity) was measured by the number of ever diagnosed diseases reported by the respondent out of a list of 18 chronic diseases (e.g., hypertension, diabetes, cardiac disease, stroke, arthritis, cancer).

*Number of other (non-psychotropic) medications* was categorized into four categories: none, 1-2, 3-5, and 6+ medications.

*Physical functioning* was measured by a modified version of the Katz activities of daily living (ADL) scale (28). The ADL indicator was defined as a need for human assistance in performing one or more of seven activities: crossing a small room, washing, dressing, eating, grooming, transferring from bed to chair, and toileting.

*Difficulty in physical robustness* was measured by a scale that assessed activities requiring physical robustness (29, 30), consisting of seven items, each rating the difficulty of performing a certain activity (pushing or pulling heavy objects, bending, crouching or stooping, walking up to 1 km, climbing 10 stairs, lifting or carrying weight up to 5 kg, and stretching the right or left arm above the shoulder) on a scale of 0 (no difficulty), 1 (some difficulty), 2 (much difficulty) and 3 (cannot do). The measure's sum score ranged from 0 to 21 was recoded to a three-level variable; low, moderate and high difficulty.

*The number of monthly visits to a family physician* was recoded as a three-level variable: no visits (0), one visit (1), and 2 or more visits (2).

Mental health and life events variables included:

*Sleeping problems* were defined as a positive answer to one or both of the following questions: (a) Do you have difficulties falling asleep? and, (b) Do you wake up early in the morning and cannot fall asleep again?

*Affective functioning* was measured by the Center for Epidemiological Studies - Depression scale (CES-D) (31), consisting of 20 items depicting depressive symptoms experienced in the last month and scored each on a scale from 0 (not at all), 1 (sometimes), 2 (most of the time), to 3 (almost every day). The Cronbach alpha coefficient of internal reliability was 0.87 in the full sample. The summary score of all responses (ranged 0-60) was then categorized to a three-level variable; low depressive symptoms (0-10), moderate (11-16), and high (17+), which corresponds to an accepted cut-off point for the definition of high depressive symptoms.

*Cognitive functioning* was measured by the Orientation-Memory-Concentration Test (32). This measure includes six test items referring to basic cognitive functions such as knowing the current date and time, remembering a name and an address, and counting backwards ( $\alpha=0.72$ ). As initially suggested, the total scores (range 0-28) were categorized into three levels: normal cognitive status estimated by a score of 0-8, slight impairment 9-19, and significant impairment 20-28.

*Holocaust survivorship* was defined according to (a) the participant's report that during 1939-1945 he or she had been in any European country occupied or dominated by the Nazi regime, and (b) a positive answer to the question "Do you define yourself as a Holocaust survivor?"

*Traumatic life events* - the number of traumatic events was measured by the question, "Have you ever undergone a traumatic event that has influenced your entire life?" with an option to list up to three such events. The response

was recoded into a dichotomous variable denoting no report of such events (0) or one or more events (1).

### STATISTICAL ANALYSIS

Differences in the level of psychotropic medication use across categories of independent variables and between men and women were tested by using chi-square tests for categorical variables.

The final multivariate logistic regression models included those indicators found to be significantly related to the combined anxiolytics and sedatives/hypnotics medication group within a set of univariate analyses. Age, gender and origin (the stratification variables in the sampling design) were included irrespective of their association with use of medications. The analysis for the combined anxiolytics and sedatives/hypnotics group was also performed separately for anxiolytics and for sedatives/hypnotics. The analysis for antidepressants group included the same correlates of interest as assessed for the combined anxiolytics and sedatives/hypnotics group. All analyses were performed using SPSS 15.0.

### RESULTS

The comparison of sociodemographic characteristics and other study variables between men ( $n=374$ ; 51.9%) and women ( $n=347$ ; 48.1%) is presented in Table 1. Although the sample was stratified by age group, gender and place of birth, the comparison of age group distribution and mean age showed that men were significantly older, probably due to a higher response rate among older men. Men had significantly higher education, more sources of income, and a higher rate of being married. On the other hand, women had significantly higher comorbidity, used more non-psychotropic medications and reported lower levels of physical functioning. The comparison of mental health indicators also showed that women reported more sleeping problems, impaired cognitive status, depressive symptoms, and past trauma than men.

Table 2 presents the crude rates of psychotropic medications use. Women used significantly more anxiolytics (19.9%) and sedatives/hypnotics (12.7%) as compared to men (8.0% and 8.6%, respectively). No significant gender differences were observed for antidepressants, antipsychotics or antiepileptics. The last two therapeutic groups were not analyzed any further in the current analysis due to their very low use in this community sample. Anxiolytics and sedatives/hypnotics were analyzed both separately and as a combined outcome group

**Table 1.** Descriptive Characteristics of the Participants by Gender: The Israeli Multidisciplinary Aging Study

Characteristic	Men (n=374) %	Women (n=347) %	Chi Square
<b>Sociodemographic characteristics</b>			
<b>Age</b>			
65-69	17.9	23.9	$\chi^2(3)=11.09^*$
70-74	17.9	23.9	
75-79	21.9	19.3	
80-84	18.7	14.1	
85-89	13.9	12.4	
90-94	9.6	6.3	
Mean age	78.7±7.7	76.8±7.7	
<b>Place of birth</b>			$\chi^2(2)3.47$
Asia-Africa	36.9	31.4	
Europe-America	32.4	32.0	
Israel	30.7	36.6	
<b>School years</b>			$\chi^2(3)=11.81^{**}$
0-4	10.9	20.1	
5-8	24.6	24.5	
9-12	35.0	28.9	
13+	29.4	26.4	
Missing (n)	(17)	(29)	
<b>Marital status</b>			$\chi^2(1)69.76^{***}$
Married	72.6	41.8	
Not married	27.4	58.2	
Missing (n)	(6)	(2)	
<b>Sources of income</b>			$\chi^2(1)8.55^{**}$
Only social security	16.0	24.9	
Additional income	84.0	75.1	
Missing (n)	(12)	(10)	
<b>Religious identification</b>			$\chi^2(2)1.78$
Religious	20.7	19.5	
Traditional	38.9	43.7	
Secular	40.5	36.7	
Missing (n)	(6)	(4)	
<b>Health and physical functioning</b>			
<b>Number of diseases</b>			$\chi^2(4)=19.20^{**}$
None	10.4	9.9	
1	19.8	13.1	
2-3	37.2	30.9	
4-5	19.3	21.6	
6+	4	24.5	
<b>Number of non- psychotropic drugs</b>			
			$\chi^2(3)8.99^*$
None	17.0	10.8	
1-2	27.0	25.6	
3-5	33.4	33.4	
6+	22.6	30.2	
<b>Need of assistance with ADLs</b>			$\chi^2(2)10.25^{**}$
No	84.5	74.9	
Yes	15.5	25.1	
<b>Difficulty in physical robustness</b>			$\chi^2(2)38.53^{***}$
Low	48.7	27.1	
Moderate	27.2	32.3	
High	24.2	40.6	
<b>Monthly number of physician visits</b>			$\chi^2(2)5.53$
None	71.4	64.0	
One	19.0	21.6	
Two or more	9.6	14.4	
<b>Mental health &amp; life events</b>			
<b>Sleeping problem</b>			$\chi^2(1)34.77^{***}$
No	38.8	18.8	
Yes	61.2	81.2	
<b>Cognitive status</b>			$\chi^2(2)21.81^{***}$
Normal	71.3	60.9	
Moderate	26.3	28.4	
Impaired	2.4	10.7	
Missing	(5)	(9)	
<b>Depressive symptoms</b>			$\chi^2(2)29.06^{***}$
Low	42.2	25.3	
Moderate	32.7	32.6	
High	25.1	42.1	
Missing (n)	(57)	(27)	
<b>Any life trauma</b>			$\chi^2(1)16.19^{***}$
No	72.5	58.2	
Yes	27.5	41.8	
<b>Holocaust survivor</b>			$\chi^2(1)0.14$
No	85.9	86.2	
Yes	14.1	13.8	
Missing (n)	(10)	(3)	

\*\*\*p&lt;0.0001; \*\*p&lt;0.01; \*p&lt;0.05

Note: Age, gender and place of birth served as stratification variables in the sampling design

**Table 2.** Patterns of Psychotropic Medications Use among Participants of the Israeli Multidisciplinary Aging Study (age 65-94)

Type of Drugs	Total (n=721) %	Men (n= 374) %	Women (n=347) %	Statistical tests <sup>1</sup> $\chi^2$	65-79 (449) %	80-94 (n=272) %	Statistical tests <sup>1</sup>
Anxiolytics	13.7	8.0	19.9	$\chi^2=21.39^{***}$	14.0	13.2	$\chi^2=0.09$
Sedatives/Hypnotics	10.5	8.6	12.7	$\chi^2=3.25^*$	6.7	16.8	$\chi^2=18.8^{***}$
Antidepressants	4.0	3.7	4.3	$\chi^2=0.16$	3.6	4.8	$\chi^2=0.65$
Antipsychotics <sup>2</sup>	1.1	0.5	1.7	$\chi^2=2.34$	1.6	0.4	$\chi^2=2.19$
Antiepileptic <sup>2</sup>	1.7	1.6	1.7	$\chi^2=0.017$	2.2	0.7	$\chi^2=2.30$
Anxiolytics & Sedatives/hypnotics (Benzodiazepines only)	21.6 (20.2)	15.0 (13.9)	28.8 (28.1)	$\chi^2=20.35^{***}$	18.7	26.5	$\chi^2=6.02^{**}$

<sup>1</sup> Chi Square test for differences between men and women and between two age groups (Degree of freedom=1)

<sup>2</sup> These categories were excluded from further analysis due to very low use in both gender groups.

\*\*\*p<0.0001; \*\*p<0.01; \*p<0.05

since this last group contained over 90% benzodiazepines. Comparing the use of these psychotropic medication groups by two age groups (65-79 vs. 80-94) showed a significant higher use of sedatives/hypnotics among the old-old (Table 2).

The tests for the associations of each characteristic with the use of the two groups of psychotropic medications, based on the full sample, showed that increasing age, gender (women), place of birth (Europe/America) and marital status (not married) were significantly associated with a higher use of anxiolytics and sedatives/hypnotics. Use of antidepressants was unrelated to gender (data not shown). The univariate analysis also showed that health status measures, physical functioning variables and depressive symptoms were associated significantly with both antidepressants and anxiolytics and sedatives/hypnotics combined, while sleeping problems and past traumas were associated positively and significantly only with use of anxiolytic & sedatives/hypnotics.

Multivariate analysis for use of anxiolytics and sedatives/hypnotics in the full sample (Table 3) showed a significant increased odds for use with each advancing year (O.R.=1.06; 95%CI =1.02-1.09) in all participants and in men but not in women. Women had a significantly higher risk compared to men (O.R.=1.86; 95% CI=1,18-2.93). Other measures positively and significantly related to the use of anxiolytics and sedatives/hypnotics were the number of other medications, sleeping problems, and depressive symptoms. Age, sleeping problems and depressive symptoms were significantly related to the use of this group of medications only among men while the number of non-psychotropic medications and any life trauma were significantly related only among women.

The results of the tests for estimating an interaction effect of gender with each predictor for anxiolytics and

sedatives/hypnotics are not shown since only marital status interacted significantly with gender (p=0.001). The multivariate analysis stratified by gender showed that being married was associated with increased odds (with borderline significance) of use of these medications among women, but with significantly lower odds among men.

In a set of multivariate logistic regression analyses performed separately for anxiolytics and for sedatives/hypnotics, the results showed that gender differences remained significant only for anxiolytics. Sleeping problems were a significant predictor for both groups of medications while depressive symptoms were a significant predictor for use of sedatives/hypnotics but not for use of anxiolytics (data not shown).

Multivariate analysis for the use of antidepressants showed no significant difference in the level of use of these medications between men and women (Table 4). High depressive symptoms were associated with an over two-fold risk for use of antidepressants only among men (although with no statistical significance). Those disabled in ADL showed higher odds of use compared to those not disabled (with borderline significance in men and the full sample).

## DISCUSSION

### GENDER DIFFERENCES IN RATES OF PSYCHOTROPIC MEDICATIONS

The findings in the current study point to a significantly higher use of anxiolytics, as well as anxiolytics and sedatives/hypnotics combined, among women compared to men, after taking into account women's worse physical and mental health. These findings are in line with findings from Australia and Britain on benzodiazepine use (19, 33),

**Table 3.** Multivariate Logistic Regression Models for Use of Sedatives/Hypnotics & Anxiolytics Medications by Gender

Characteristics	All			Men			Women		
	O.R.	95% CI	p-value	O.R.	95% CI	p-value	O.R.	95% CI	p-value
<i>Sociodemographic characteristics</i>									
Age (continuous)	1.06	1.02-1.09	0.001	1.09	1.04-1.14	<0.0001	1.03	0.99-1.08	0.17
Gender (women vs. men)	1.86	1.18-2.93	0.008						
Place of birth			0.137			0.33			0.34
Asia-Africa vs. Israel	0.76	0.45-1.30	0.32	0.87	0.35-2.12	0.75	0.66	0.33-1.32	0.24
Europe-America vs. Israel	1.29	0.78-2.10	0.32	1.56	0.68-3.62	0.30	1.08	0.57-2.05	0.82
Married vs. not married	1.06	0.68-1.67	0.80	0.49	0.25-0.97	0.04	1.74	0.96-3.16	0.07
Number of diseases	1.05	0.93-1.19	0.41	1.17	0.93-1.48	0.18	1.02	0.87-1.19	0.80
Number of non-psychotropic medications	1.18	1.11-1.29	0.003	1.09	0.90-1.31	0.40	1.20	1.05-1.37	0.008
Need of assistance with ADLs - Yes vs. No	1.46	0.80-2.67	0.22	2.34	0.80-6.80	0.12	1.06	0.5-2.26	0.89
Difficulty in physical robustness	0.92	0.65-1.30	0.63	0.82	0.48-1.43	0.50	1.07	0.68-1.69	0.77
Sleeping problems - Yes vs. No	2.69	1.48-4.87	0.001	3.57	1.48-8.61	0.005	2.00	0.86-4.63	0.11
Depressive symptoms			0.042			0.106			0.32
Moderate vs. low	1.15	0.65-2.05	0.63	1.26	0.52-3.03	0.61	1.25	0.55-2.84	0.60
High vs. low	1.98	1.07-3.64	0.03	3.26	1.28-8.28	0.01	1.84	0.77-4.4	0.17
Any life trauma	1.18	0.77-1.80	0.45	0.78	0.36-1.68	0.53	1.60	0.93-2.75	0.09

O.R. = Odds Ratio; CI = Confidence Interval

and with a U.S. study, where elderly women were more likely than elderly men to use all psychotropic agents, and one and a half times more likely to use anti-anxiety and antidepressants but not more likely to use sedatives (24). Data from two national health surveys of U.S. adults (17+) showed significant age-adjusted gender differences in the same direction for any psychotropic medication use, antidepressant use and the use of anxiolytics/sedatives/hypnotics combined (34). The current study did not show significant gender difference in use of antidepressants unlike the findings in the above cited studies. This could be due to the lack of statistical power in detecting gender differences in a low level outcome variable such as the use of antidepressants (3.7% in men; 4.3% in women).

Several explanations were suggested in the literature for the gender gap in the use of psychotropic medications. First, this gap was naturally linked to higher levels of anxiety and depressive disorders observed among women (35-37). Yet, this argument cannot explain the gender gap in studies that, similar to ours, showed higher female use independent of psychiatric morbidity (38, 39) and higher use of benzodiazepines in women with no diagnosed disorder of anxiety or insomnia (21). A second explanation is related to patients' health behavior. It has been suggested that women more commonly complain of psychological symptoms, more frequently

seek professional help, and consequently are more likely to be prescribed a psychotropic medication (38). In the current investigation, however, the frequency of monthly visits to the family physician was not related to the use of psychotropic medications and did not reduce gender differences in use of anxiolytics and sedatives/hypnotics when adjusted for within the multivariate model (data not shown).

The observed gender gap was also viewed and studied as a gender bias from the perspective of the primary care providers who may be less stringent when prescribing these medications for women (21, 38). Lay people are also more likely to identify mental health disorders among women (40), which can also lead to gender differences in health care seeking for symptoms of mental ill-health.

In a body of research devoted to assessing inappropriate drugs prescription, findings indicated that older women were more likely to be prescribed inappropriate drugs in community-based settings (41-43). In several studies, the inappropriate prescriptions included psychotropic drugs (20, 41, 44, 45) or benzodiazepines (46).

These findings reflect the importance of further understanding the sources of the gender differences in the use of psychotropic medications. If women tend to complain more of depressive symptoms and therefore receive more medical treatment, it may then be important to encour-

**Table 4.** Multivariate Logistic Regression Models for Use of Antidepressants by Gender

Characteristics	All			Men			Women		
	O.R.	95% CI	p-value	O.R.	95% CI	p-value	O.R.	95% CI	p-value
<i>Sociodemographic characteristics</i>									
Age (continuous)	0.99	0.93-1.05	0.72	1.05	0.96-1.14	0.32	0.94	0.85-1.03	0.18
Gender (women vs. men)	0.90	0.37-2.16	0.81						
Place of birth			0.60			0.32			
Asia-Africa vs. Israel	0.64	0.24-1.72	0.37	0.36	0.08-1.69	0.20	1.15	.28-4.75	0.85
Europe-America vs. Israel	0.68	0.26-1.78	0.43	0.41	0.10-1.71	0.22	0.91	.23-3.65	0.89
Married vs. not married	1.84	0.71-4.80	0.21	1.82	0.44-6.60	0.41	1.65	0.46-5.93	0.45
Number of diseases	1.11	0.83-1.36	0.40	1.18	0.79-1.74	0.43	1.18	0.83-1.67	0.35
Number of non-psychotropic medications	1.05	0.85-1.28	0.67	1.03	0.74-1.43	0.87	1.01	0.76-1.34	0.94
Need of assistance with ADLs - Yes vs No	3.03	0.97-9.52	0.06	6.36	0.86-47.0	0.07	2.76	0.58-13.1	0.20
Difficulty in physical robustness	1.11	0.55-2.23	0.77	0.54	0.17-1.72	0.30	1.62	0.64-4.09	0.31
Sleeping problems -Yes vs. No	0.89	0.33-2.42	0.82	1.47	0.34-6.3	0.60	0.46	0.11-1.87	0.28
High vs. Low & Moderate Depressive symptoms <sup>1</sup>	0.95	0.36-2.48	0.92	2.49	0.62-9.92	0.20	0.47	0.12-1.91	0.29
Any life trauma	1.37	0.59-3.17	0.46	1.56	0.41-5.95	0.51	1.79	0.57-5.65	0.32

O.R. = Odds Ratio; CI = Confidence Interval; <sup>1</sup>Depressive symptoms was collapsed in this table from three to two categories (0-16, 17+).

age men's reporting of depressive symptoms and seeking care for themselves (47). Thus, health care providers may need to ensure that reporting mental health problems is perceived as legitimate by male patients and does not threaten their identity or masculinity (48, 49). On the other hand, it is possible that health providers are more inclined to attribute somatic complaints in women to mental health conditions and therefore over-prescribe an inappropriate treatment. In the latter case, steps should be taken to reduce excessive prescribing to older women.

#### **GENDER-SPECIFIC RISK FACTORS FOR USE OF ANXIOLYTICS & SEDATIVES/HYPNOTICS**

In our study, no significant interactions were observed between the studied correlates of medication use and gender, except for marital status. Thus, our findings support some research findings showing that physical and mental health risk factors are associated similarly with use of long term benzodiazepines among men and women (22) or with use of any psychotropic drug (50). In contrast, other findings demonstrate gender differences in the associations of office visits to general practitioners with anxiolytic, antidepressant and benzodiazepines use (21, 45).

As stated above, marital status varied significantly in its association with use of anxiolytics and sedatives/hypnotics combined across gender groups. Married men were at a significantly lower risk and women at a borderline higher

significant risk than unmarried elderly to use anxiolytics and sedatives/hypnotics. This finding is not in line with results from a Swedish investigation where divorced or widowed women were more extensive psychotropic drug users than married women, with no di  
respective marital categories (50). However, in that study, both single men and women were at the lowest risk. In our sample, less than 2% of participants were single, and therefore could not be studied separately from widowed/divorced elderly. The proposition that a woman spouse can facilitate access to medical treatment by encouraging the husband to consult a physician or specialist (51) was not supported in this study. On the contrary, among men, a spouse was associated with significantly less use of anxiolytics and sedatives, after taking into account men's lower rate of sleeping problems and depressive symptoms, thus suggesting a higher sense of psychological wellbeing among married men in comparison to those widowed or divorced.

Several studied indicators (age, number of non-psychotropic medications, sleeping problems and depressive symptoms) showed differential trends of associations among men and women. High depressive symptoms and sleeping problems were associated with a significant three-fold risk of using anxiolytics and sedatives combined among men, while among women the almost two-fold risk was not significant. Also, the number of other medications was a significant risk factor for women

and not for men. These variations only partly resemble findings from a U.S. study, where psychotropic drug use was strongly correlated with depressive symptoms in both genders, yet correlated with sleeping problems only in men and with medical conditions only in women (23). The adjusted risk for any life trauma was a borderline significant risk factor among women (but not among men), in line with other findings relating women's depression to a wide range of life events while men's depression is more closely linked to their own health status (52).

As shown previously, the use of sedatives/hypnotics was significantly higher among the old-old (80+), while age was actually related to use of these medications only among men. These findings suggest that current medication use among old-old women may continue to reflect past prescribing habits whereas, among old-old men, increasing age and consequently sleeping problems seem to determine a higher medication use.

#### USE OF ANTIDEPRESSANTS

Due to the statistical limitation in assessing significant multivariate results for use of antidepressants, only trends in the associations of the studied correlates with the use of this kind of medications can be discussed. The high odds for use of antidepressants in both women and men with ADL disability has been observed previously in an analysis for all psychotropic drugs using IADL disability as an indicator of functioning (24). These findings indicate that depression often co-occurs with multiple health, functioning and psychosocial problems, and is not always perceived by the elderly and their physicians as high priority (53).

A second observation in the current analysis relates to the surprising lack of association between high depressive symptoms and use of antidepressants among women. Men with high depressive symptoms had a non-significant, over two-fold risk for use of antidepressants, but women showed non-significant odds in the opposite direction. This observation strengthens the concern that physician's attitudes toward women's mental health complaints are different from their attitudes toward men's complaints. It is likely that past prescribing of benzodiazepines for women was not updated in response to potential changes in women's complaints along the aging process. As a result, women were at a higher risk of not being properly treated.

#### LIMITATIONS

One of the limitations in this study concerns a lack of clinical diagnosis of depression and other specific

mental disorders. For assessment of depression, we used an accepted cut-off point on the CES-D depressive symptoms scale. However, since only cognitively-normal respondents, who were able to answer the self-report questions, were included in this study, one may assume that self-reports in this study were reasonably accurate.

Another limitation is the time that has passed since the data were collected, which raises a question as to more recent changes in prescribing psychotropic medications, particularly antidepressants. Thus, according to empirical evidence in Western countries, the use of antidepressants has increased in the last two decades (34). However, the current findings can serve as a basis for evaluating future changes in prescribing these medications.

Another limitation relates to the exclusion of proxy participants and residents of old-age homes, which presents a bias in the representation of the original national sample. Nevertheless, since the focus of this investigation concerns gender differences, the estimation of crude rates of medication use among men and women was performed employing the full sample (including proxies), and the results indicated similar gender gap in using anxiolytics and sedatives/hypnotics combined (15% among men and 29.6% among women). In addition, all stratification variables were included in the multivariate analyses as accepted in population surveys for stratified sampling design (54).

#### CONCLUSIONS

The gender differences in the use of anxiolytics and sedatives/hypnotics as well as in correlates of their use observed in this study raise a concern with regard to disparities in mental health care quality between men and women. In order to develop guidelines to increase clinicians' awareness of differential reporting of psychological symptoms and attitudes to psychotropic medications between gender groups, it is important to study these issues and report findings separately for men and women. Targeted efforts to avoid excessive prescribing of anxiolytics to older women should be considered by clinicians. In general, this study also points to a possibly low detection of depression among the elderly and a need to study further medical treatment practices of depression among both men and women.

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