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**To cite this article:** Louise Stjernberg, Johan Berglund & Anders Halling (2006) Age and gender effect on the use of herbal medicine products and food supplements among the elderly, Scandinavian Journal of Primary Health Care, 24:1, 50-55, DOI: [10.1080/02813130500475522](https://doi.org/10.1080/02813130500475522)

**To link to this article:** <https://doi.org/10.1080/02813130500475522>



Published online: 12 Jul 2009.



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ORIGINAL ARTICLE

## Age and gender effect on the use of herbal medicine products and food supplements among the elderly

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### Abstract

**Objective.** To describe the users of herbal medicine products and food supplements with regard to age and gender specifically among persons aged  $\geq 60$  years. **Design.** A descriptive study with baseline data from a longitudinal study of the elderly, stratified into different age cohorts (60–69, 70–79, 80–89, and  $\geq 90$  years). **Setting.** Blekinge county, situated in south-eastern Sweden. **Subjects.** In total 1380 persons aged 60–96 years (median age 78 years). **Main outcome measures.** Current use of herbal medicine products and the use of food supplements. **Results.** Of the participants, 264/1380 (19.1%) used at least one herbal medicine product, 184/1380 (13.3%) used at least one food supplement and 382/1380 (27.7%) used herbal medicine products and/or food supplements. In all regression models, women had a higher probability of using herbal medicine and/or food supplements in comparison with men. Focusing on the use of herbal medicine products alone and the combination of using herbal medicine and/or food supplements, decreased use was seen with increasing age. However, 27.9% were still users of herbal medicine products and/or food supplements in the age group 80–89 years. In comparison, 14% were users in the age group  $\geq 90$  years. Age did not have an impact on the probability of taking food supplements. **Conclusion.** General practitioners need to consider the high use of herbal medicine products and food supplements among the elderly when making decisions on treatment.

**Key Words:** Age, food supplements, gender, herbal medicine

Herbal medicine products (HMPs), vitamins and minerals (food supplements) are widely used and increasingly prevalent throughout the industrialized world [1–7]. Among US citizens a 380% increase in the use of HMPs and a 130% increase in the use of high-dose vitamin use were seen between 1990 and 1997 [6]. Also, in Sweden the prevalence of use increased steadily amongst adults during 1980s and 1990s: threefold for the use of HMPs and 70% for food supplements [8–10].

Among Swedish adults (16–84 years) the use is associated with age, gender, and several sociodemographic and health behavioural factors [8–12]. In comparison with men, females seem to be the more frequent users of food supplements, and among both men and women high use is seen among the elderly population [9,10,12]. In addition, the use of HMPs is higher among women compared with men and an

Herbal medicine products and food supplements are increasingly used throughout the industrialized world.

- In this elderly population almost 30% were current users and women had a higher probability of being users than men.
- The probability of use decreased with increasing age: 28% were users in the age group 80–89 years compared with 14% in the age group  $\geq 90$  years.
- General practitioners need to consider the extensive use of herbal medicine products and food supplements among the elderly when making decisions on treatment.

increasing use with increasing age among men has been suggested [8–10,12]. The use is described in

addition to traditional therapies and is related to high use of healthcare services [13,14]. It is reported to be used independently of conventional medicine and more than half of the users do not discuss their use with their physician [6,8,14]. Considering the potential toxicity of these drugs and in order to enable evidence-based advice, healthcare professionals need to increase their knowledge of user populations [5,15,16]. Earlier Swedish studies have examined populations within a large age span, and not specifically elderly persons [8–12]. The aim of this study was to describe the users of HMPs and food supplements, with regard to age and gender, specifically among persons aged  $\geq 60$  years in a population-based sample in a community in the south-east of Sweden.

## Materials and methods

### *Study area*

The study was performed within the Swedish National Study on Aging and Care (SNAC), an interdisciplinary longitudinal study, which commenced in 2001 [17]. This study includes baseline data collected between April 2001 and May 2003 from Karlskrona municipality (with 60 600 inhabitants), situated in the south-east of Sweden. A random, age stratified sample was selected from the population registry among those aged 60, 66, 72, 78, and 81 years. Among those aged 84, 87, 90, 93, and 96 years the entire population was included. For easier management, the participants were divided into the following age groups: 60–69, 70–79, 80–89, and  $\geq 90$  years. The elderly received an invitation to participate in the study by post. New contacts, via telephone (three attempts), were made after 2 weeks to those not replying to the first invitation. The participants were invited to the research centre and for those unable to come a home visit was made. Prior to the visit the participants were asked to bring a list or the packaging of prescribed drugs, non-prescribed drugs, and HMPs used. To verify the use of current drugs, a research nurse interviewed the participants and filled in the questionnaire answers.

### *Definitions*

In this study HMPs include medicinal products in which the active ingredient or ingredients derive from natural sources, have not been processed too extensively and consist of part of a plant or animal, bacterial culture, mineral, salt, or salt solution. Also, they are products suitable for self-medication in accordance with tested national tradition or tradition in neighbouring countries in respect of drug usage

[18,19]. According to the manufacturer's description of intended use, HMPs were classified into the following indication groups: cardiovascular, psychiatric, gastrointestinal, musculoskeletal, urogenital, and infectious [18]. Food supplements include vitamins and minerals normally found in and consumed as part of the diet according to the established list from the European Parliament and the Council of the European Union [20]. None of the used drugs was prescribed by a physician or other healthcare practitioner.

### *Statistical analysis*

Descriptive statistics were computed to evaluate the data for sample characteristics. A Pearson chi-square test was used to test differences in the characteristics between groups and  $p < 0.05$  was considered as statistically significant.

Binary logistic regression analysis was used to determine age and gender differences in the use of HMPs and/or food supplements. The statistical significance of the variables was determined using a 95% confidence interval (CI).

The simultaneous relationship among the dependent variable and independent variables were modelled and evaluated by determining odds ratios (ORs). Possible interaction between the independent variables was tested. All analyses were performed using the statistical software package SPSS (Version 13.0).

### *Ethics*

Ethical permission for the study was obtained from Lund University. Written consent was obtained from all participants.

## Results

### *Characteristics of participants*

A total of 2312 individuals were invited to participate in the study. In total, 1402 (61%) of those invited agreed to participate.

Of the non-participants, 39% were men and 61% were women. Unwillingness involved 756/910 (83%); 92/910 (10%) considered themselves too sick and 62/910 (7%) could not be contacted.

Of the participants, a total of 1380/1402 answered all the questions analysed in this study.

The median age among the participants was 78 years (range 60–96) and the age distribution was: 392/1380 (28.4%), 340/1380 (24.6%), 524/1380 (38%), and 124/1380 (9%), respectively, in age groups: 60–69, 70–79, 80–89, and  $\geq 90$  years old.

Table I. Distribution of herbal medicine products and/or food supplements used, according to gender and age group.

(n = 1380)	Herbal medicine products		Food supplements		Herbal medicine products and/or food supplements	
	n	(%)	n	(%)	n	(%)
Gender						
Male (n = 576)	97	(16.8)	52	(9.0)	128	(22.2)
Female (n = 804)	167	(20.7)	132	(16.4)	254	(31.6)
p*	0.067 n.s.		0.000		0.000	
Age group (years)						
60–69	91	(23.2)	45	(11.5)	118	(30.1)
70–79	71	(20.8)	45	(13.2)	100	(29.4)
80–89	93	(17.7)	82	(15.6)	146	(27.9)
≥90	9	(7.3)	12	(9.7)	18	(14.5)

\*Pearson chi-square.

Of the participants, 576/1380 (41.7%) were males and 804/1380 (58.3%) females.

#### Use of HMPs and/or food supplement

In total, 264/1380 (19.1%) used at least one HMP, 184/1380 (13.3%) used at least one food supplement, and 382/1380 (27.7%) used HMPs and/or food supplements. The distribution of gender and age among the users is given in Table I. Among the users of HMPs and/or food supplements, 21/128 (16%) men and 45/254 (18%) women used more than one product simultaneously. Compared with men, women used more food supplements and also HMPs and/or food supplements (Table I).

#### Use of HMPs according to indication

Among the 264 users, 34 participants used more than one HMP. In total, 111/1380 (8.0%) used HMPs and were classified within the indication group psychiatric, 74/1380 (5.4%) cardiovascular, 38/1380 (2.7%) infectious, 34/1380 (2.5%) musculoskeletal, 23/1380 (1.7%) gastrointestinal, and 18/1380 (1.3%) urogenital health-related conditions. Women used more HMPs compared with men within the indication groups musculoskeletal (Pearson chi-square,  $p = 0.011$ ) and urogenital related conditions (Pearson chi-square,  $p = 0.002$ ). The distribution of HMPs used among the users according to indication group is shown in Figure 1.

#### Logistic regression analysis

**Dependent variables.** Three different models were used, with the following dependent variables:

- model 1: whether the participants took herbal medicine or not;
- model 2: whether the participants took food supplements or not;

- model 3: whether the participant took HMPs and/or food supplements or not.

Each dependent variable was categorized on a binary scale (0 = no and 1 = yes).

#### Independent variables

No significant effect on the outcome was seen when testing for interaction between gender and age group and this was therefore not included in the model. Hence, independent variables were:

1. gender (0 = men and 1 = women);
2. age (stratified into the following groups: 60–69, 70–79, 80–89, and ≥90 years, coded as dummy variables).

#### Gender and age as predictors for taking HMPs and food supplements

In all analysed models the probability of taking HMPs and/or food supplements was significantly

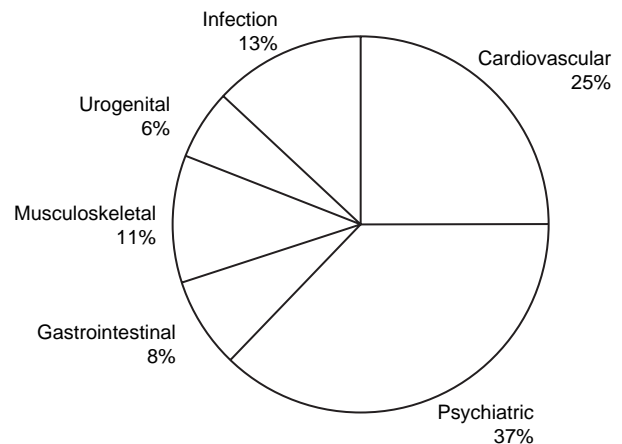


Figure 1. Distribution of herbal medicine products used among users according to indication group.

higher for women compared with men. In comparison with ages 60–69 years, significantly decreased use with increasing age group was seen in ages 80–89 and  $\geq 90$  years among those using HMPs alone and in age  $\geq 90$  years among those using HMPs and/or food supplements.

Age did not have any impact on the probability of decreased use among those taking food supplements (Table II).

## Discussion

We found that one-third of the elderly used HMPs and/or food supplements. Women had a higher probability of being users in comparison with men. Furthermore, use decreased with age.

Most other studies have analysed populations' historical use of these products [1,2,5–8,14,21]. A strength of this study, minimizing risks of recall bias, is the analysis of the present use of HMPs and/or food supplements in a large population including the oldest people in Sweden. Even if the non-participants consisted mainly of women, this study included more women than men, giving only a small risk of bias due to gender differences among the participants. Since the questionnaire was treated confidentially and, when necessary, close relatives helped those with difficulties in reporting their personal use, we find the risk for over- or under-estimation to be negligible.

A shortcoming, also experienced by others, was the difficulty in comparing the use of HMPs and food supplements with other studies, due to different definitions of these preparations [22]. When com-

paring our results with others, we have endeavoured to find and use definitions in agreement with the definitions used in this study.

Sex and age have earlier been shown to be most important factors for the use of HMPs [12]. We did not find any significant differences in the use solely of HMPs between men and women. However, other studies in Swedish from different regions report elderly women as higher users of HMPs compared with men [8–10,12].

As shown by others, the women in this study also used more HMPs and/or food supplements than men (almost one-third of the women versus one-fifth of the men) [3,8–10,21].

The majority of the alternative medicine users reason that their usage is for prevention or treatment of existing illness [6]. One explanation for the gender difference might be that women in general seem to be more observant of their health status. Several studies have found women to be more likely than men to carry out what they believe is health management [23–25].

More than one-third of those using HMPs in this study were classified under the indication group psychiatric-related conditions. In addition, a study in Italy states that alternative medicines seem to have a complementary role for the elderly with self-perceived psychological symptomatology or depressive disorders [3]. The second most common indication, cardiovascular conditions, involved more than a quarter of users. Urinary health-related conditions concerned the smallest group of users.

We did not describe concurrent use of prescription medication. However, earlier reports state that

Table II. Binary logistic regression predicting independent factors correlated with intake of herbal medicine products and/or food supplements.

Factor	Odds ratio	Confidence interval	p-value
Taking herbal medicine			
Sex	1.382	1.045–1.828	0.023
Age*			
70–79 years	0.862	0.606–1.225	0.407 n.s.
80–89 years	0.694	0.501–0.962	0.028
$\geq 90$ years	0.253	0.118–0.500	0.000
Taking food supplements			
Sex	1.988	1.412–2.800	0.000
Age*			
70–79 years	1.148	0.737–1.790	0.542 n.s.
80–89 years	1.362	0.920–2.017	0.123 n.s.
$\geq 90$ years	0.734	0.373–1.443	0.370 n.s.
Taking herbal medicine and/or food supplements			
Sex	1.699	1.325–2.179	0.000
Age*			
70–79 years	0.947	0.688–1.305	0.740 n.s.
80–89 years	0.858	0.641–1.148	0.303 n.s.
$\geq 90$ years	0.356	0.205–0.615	0.000

\*The three age groups were compared with age group 60–69 years.

elderly users with neuropsychiatric disorders are more highly represented in combining conventional drugs and herbal medicine products [3]. In Eisenberg's study nearly 1 in 5 of those taking any regularly prescribed medications concurrently used at least one HMP, a high-dose vitamin, or both [6].

The use of prescribed pharmaceuticals increases with increasing age but the opposite applies to the use of HMPs [11]. The findings that the probability of taking HMPs alone or HMPs and/or food supplements decreased with increasing age are in accordance with a study from the US where the users in the age group 60–69 years comprised 21.3%, in the age group 70–84 years 15.3%, and among those  $\geq 85$  years 9.1% [21]. We have not found any other studies describing the use of HMPs and food supplements among the oldest population in Sweden [8–12]. This fact pinpoints the importance of describing their use despite limitations in drawing conclusions since they only represented 9% of the participants in this study.

We found a significantly decreased use in the age group  $\geq 90$  years. This might be due to the extreme aged impairment of daily life and/or that they are more dependent on those in their surroundings to purchase these products, economic limitations, extended use of healthcare services and intake of conventional drugs, and/or that the product marketing does not reach this population.

Although the use of HMPs decreased with increasing age, between 17.7% and 30.1% of the participants in the age groups  $< 90$  years used at least one HMP and/or food supplements. The total number of users in our study is in alignment with a population-based study in the US where 18.8% of the adults mentioned their use of natural products [21]. However, there seems to be an even greater interest in using HMPs in the general population in the UK, where 34% were users [7].

If the use goes unreported there is a risk of interaction when used together with conventional therapies and medicine [15,16]. By including this knowledge of the use of HMPs and food supplements in medical school curricula, physicians and healthcare practitioners would be better equipped to respond to patient enquiries about HMPs and food supplements and thereby to fulfil their role as patient advocates [26].

Studies aiming at epidemiological aspects of the use of HMPs and food supplements are few; they usually describe the use of complementary and alternative medicine in a wider perspective leading to difficulties in drawing conclusions on the use of HMPs and food supplements specifically [1,2,5–7,14,21,27]. As a complement to earlier Swedish studies, with a similar aim to that of our study but

mainly performed in other regions, this study provides knowledge specifically focusing on an elderly population living in the south-east of Sweden [8–12].

In conclusion, almost 30% of the participants used HMPs and/or food supplements. The probability of being a user was greater among women than men. We found a decreased probability of using HMPs with increasing age. However, this did not apply to the use of food supplements. General practitioners need to consider the high use of HMPs and food supplements among the elderly when making decisions on treatment, thus enabling evidence-based advice.

### Acknowledgements

The authors would like to thank the Swedish Ministry of Health and Social Affairs, the Blekinge Institute for Research and Development and the County Council of Blekinge for funding this study. They are grateful to the staff and participants of SNAC Blekinge for their help and interest in the study. They also thank Wendy Engman for reviewing the English manuscript, Anna Lengstedt for sharing her knowledge on herbal medicine products, and Claes Jögreus for help with statistical analysis.

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