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A study on current status of herbal utilization in Bulgaria: Part 1 - Application of herbal medicines

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Despite increasing interest in phytotherapy, little is known about patterns of herb utilization in modern society. Ethnobotanical studies are useful tool to evaluate the dynamics of traditional knowledge. To our knowledge, there is no study focused on collection of information about herbal utilization from a wide range of people in Bulgaria. 1) the attitudes toward benefits of medicinal plants; 2) the most popular herbal application; 3) the manner in which herbs are being obtained; 4) how specific demographic features of the participants related to their attitude. This survey was carried out in different regions in Bulgaria, between May and July 2013 using the face-to-face interview technique. A descriptive statistic procedure and chi-square test were employed for data analysis. Simple linear coefficient test is calculated to determine the correlation between herbal knowledge and demographic features of the informants. The results revealed that 93.89% of the respondents believed that herbs are beneficial for their health; age exerted impact on this statement. A larger proportion of the respondents uses herbs frequently and if necessary. About 60% of the informants use medicinal plants for disease treatment and prophylaxis. Only 11.37% of respondents reported to gather herbs from natural habitats; impact of age and place of residence was established. Self-gathering is preferred by the respondents belonging to groups with low socio-economic status. More than a half of the respondents (61.92%) prefer to buy herbs from the pharmacy. The survey shows the persistence of traditional knowledge in contemporary Bulgarian population. The impact of modern society on herbal application is obvious. Demographic features exerted negligible influence on the attitudes toward herbal utilization.

Key words: Ethnobotanical survey, traditional knowledge, herbal utilization.

INTRODUCTION

Plants have been used by people since ancient times to treat diseases worldwide. Recently a tendency of increasing utilization of medicinal plants in developing and industrialized countries has been reported (Fakeye et al., 2009; Popat et al., 2001; Staines, 2011; van Andel and Carvalheiro, 2013). Despite widespread use, little is

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known about patterns of herbal utilization and why people choose to use herbs. Nowadays ethnobotany as interdisciplinary subject is focused on use of food and medicinal plants (Alcorn, 1995). One of the main goals of the ethnobotanical studies is to document the dynamics of traditional knowledge about plants (Pardo-de-Santayana et al., 2013). Different factors lead to changes of herbal utilization in modern society: globalization, migration from villages to cities, cultural changes etc. (Yeşilada et al., 2003; Vandebroek and Balick, 2012). Therefore, a matter of interest from an ethnobotanical viewpoint is to establish how specific demographic features of people related to their opinion on benefits of herbal utilization.

The statement that the plants have beneficial health effects is widely accepted, but the empirical data which supported this idea is limited (Heinrich, 2003). Herbal utilization in Bulgaria has a long tradition (Nedelcheva, 2012). In the past transmission of knowledge of medical practices has been documented by teachers, university professors, naturalists, folklorists and physicians (Kozuharova et al., 2013). Some recent etnobotanical studies provide data on current medicinal plants knowledge regarding the most popular herbs and their therapeutic use (Ivancheva and Stancheva, 2000; Ploetz, 2000; Leporatti and Ivancheva, 2003; Ploetz and Orr, 2004; Kültür and Sami, 2009; De Boer, 2013; Bertsch, 2011; Kozuharova et al., 2013). Target groups usually included people known to be interested in medicinal plants, but a random sample of people were also interviewed. To our knowledge there is no study focused on collection of information about herbal utilization from a wide range of people in Bulgaria.

The aim of our study was to establish the statement of a representative random sample of Bulgarian people about herbal utilization in order to find out: 1) the attitudes toward benefits of medicinal plants; 2) the most popular herbal application; 3) the manner in which herbs are being obtained; 4) how specific demographic features of the participants related to their attitude.

MATERIALS AND METHODS

Interview

This survey was carried out in different regions in Bulgaria during May to July 2013 using the face-to-face interview technique as described in similar studies (Akaydin et al., 2013; Seid and Aydagnehum, 2013). The interviewed people were chosen randomly. As a first step of the study, the demographic characteristics of the people who accepted to participate in the interview were determined. The second part of the questionnaire included questions on the herbal utilization.

Education of interviewers

Ethnobotany Club student members (Faculty of Natural Sciences, University of Shumen, Bulgaria) contributed to the survey. The students were trained to conduct an ethnobotanical survey. They were acquainted with: the stages of the study, the questions in the questionnaire, the tasks and responsibilities of interviewers, the tasks and responsibilities of the controller and the protocol survey. A pilot study was carried out with 30 respondents in order to improve the questionnaire: abstruse questions were edited, arrangement of questions was changed, the number of possible answers was increased etc. The interviewers were able to explain issues which are unclear to some respondents.

Check for logic errors

Data from each questionnaire were checked for inconsistencies. Questionnaires containing logical errors were excluded from the study.

Statistical analisys

A descriptive statistic procedure like percentage and frequency distribution were employed for data analysis. The chi-square test was used to compare different groups of data. Moreover, simple linear (Pearson correlation) coefficient test is calculated to determine the correlation between medicinal plant knowledge and demographic features of the informants. Depending on the values of the Pearson's contingency coefficient (r) the following types of correlation were differentiated: $r = 0$ lack of correlction, $0 < r \leq 0.3$ weak correlation, $0.3 < r \leq 0.5$ moderate correlation, $0.5 < r \leq 0.7$ significant correlation, $0.7 < r \leq 0.9$ strong correlation, $0.9 < r < 1$ very strong correlation, $r = 1$ means functional dependence.

RESULTS AND DISCUSSION

In present survey a total of 563 interviews were conducted. 88 of the completed questionnaires were excluded due to established logical errors. So, the final sample included 475 respondents from 20 urban and 23 rural areas in Bulgaria (Figure 1).

To ensure that the results of such kind of surveys are representative, the sample should reproduce the structure of the population. The analysis revealed that the sample in present study was representative of the Bulgarian population in terms of sex, age, level of education and place of residence (Figures 2, 3, 4 and 5).

The attitude toward the medicinal plants utilization could be influenced also by occupation and marital status of respondents (Aydin et al., 2008; Fakeye et al., 2009; Akaydin et al., 2013). These demographic features of the participants in the present survey are presented in Figures 6 and 7.

Data on the attitudes of informants toward the benefits and utilization of herbs are given in Table 1. Influence of specific demographic variables of the participants on the responses to the inquiry was presented in Table 2. In order to determine the correlation between items questioned and demographic variables; standardized Pearson correlation coefficient was calculated.

The results revealed that 93.89% of the respondents believed that herbs are beneficial for their health (Table 1). This data is in accordance with increasing popularity

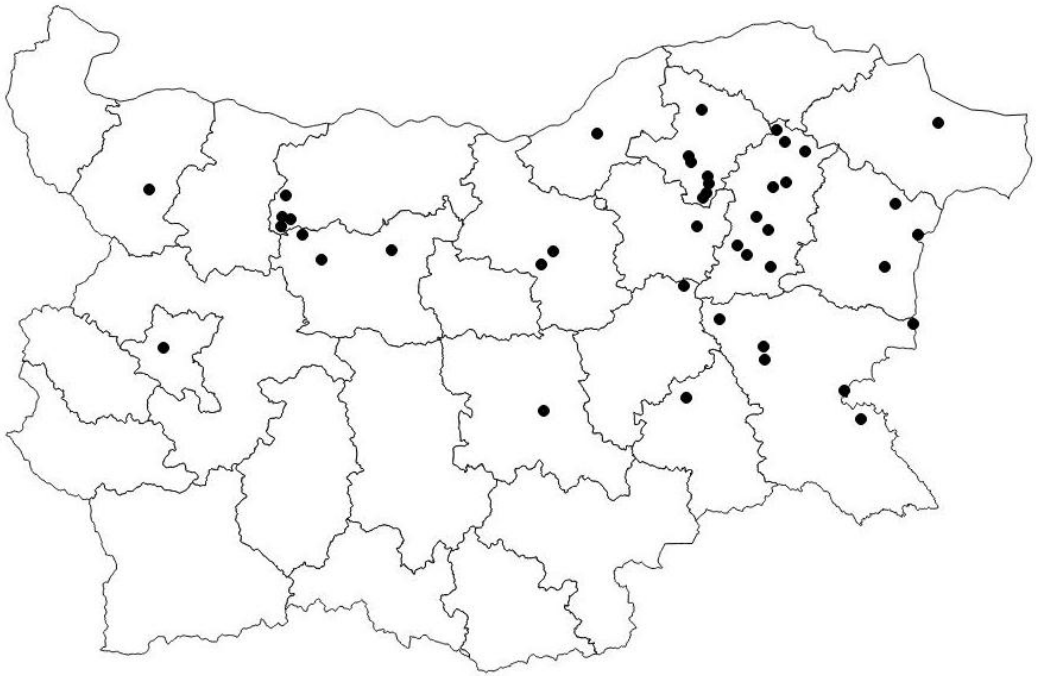

Figure 1. Regions in Bulgaria where the interviews were conducted.

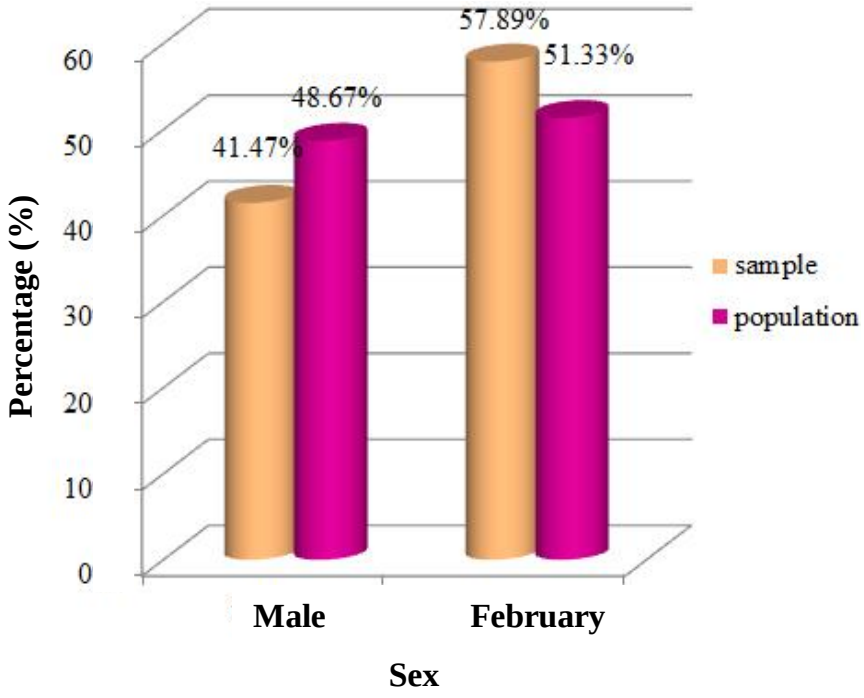

Figure 2. The distribution of the respondents and Bulgarian population according to sex ratio.

of phytotherapy reported in the last decades worldwide (Aydin et al., 2008; Samojlik et al., 2013; Osemene et al., 2011; Sim et al., 2013; Wu et al., 2011; Wachtel-Galor and Benzie, 2011). The data analysis show that only age predicted the answers to the question “Do you think that herbs are beneficial for your health?”, other variables had

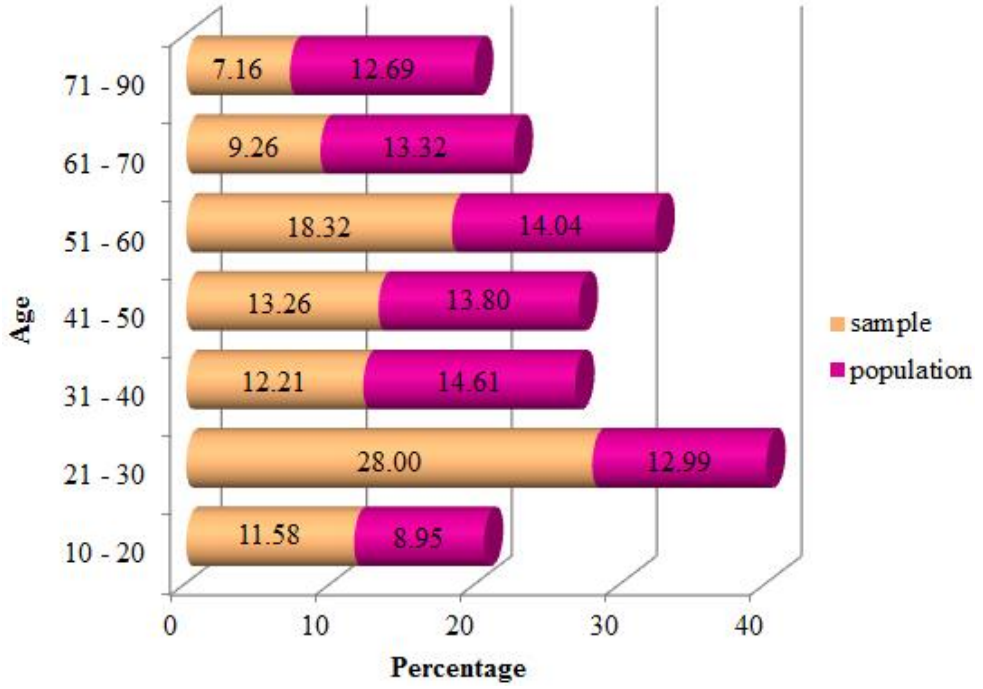

Figure 3. The distribution of the respondents and Bulgarian population according to age.

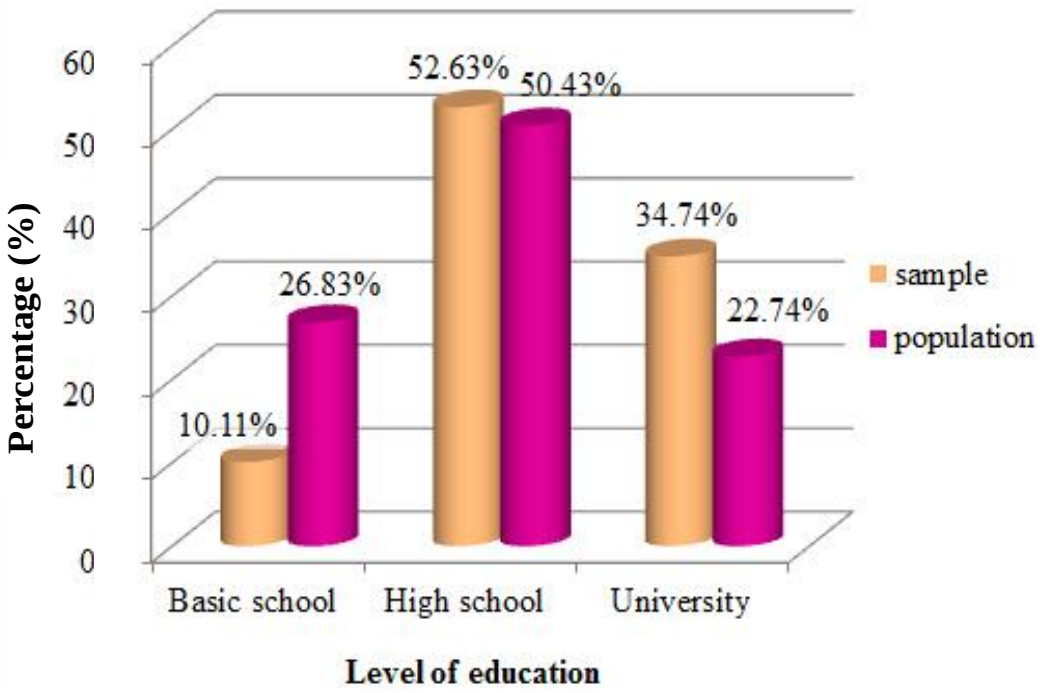

Figure 4. The distribution of the respondents and Bulgarian population according to level of education.

no sufficient influence (Table 2). The respondents belonging to the age groups 41 to 50 and 71 to 90 have given higher percent of negative answers as compared with the whole sample, respectively 7.94 and 5.88%

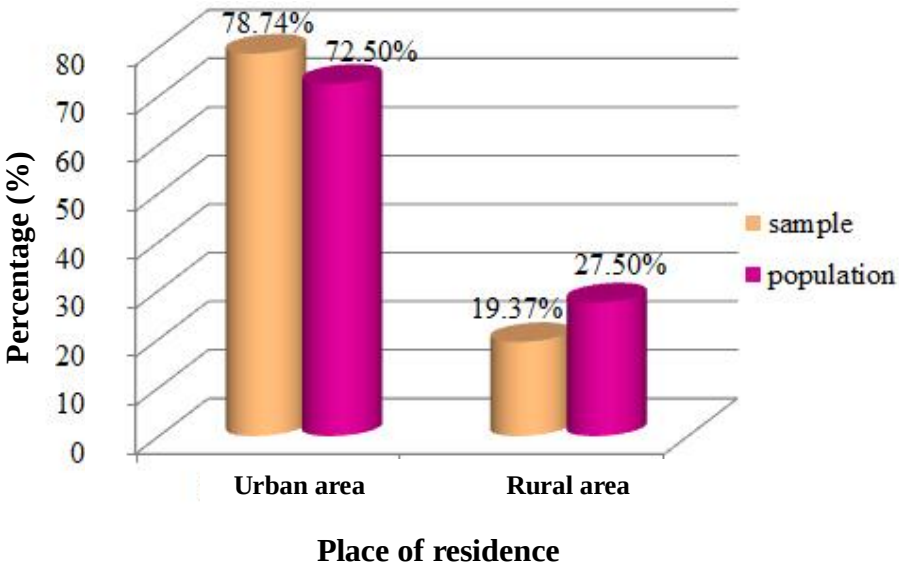

Figure 5. The distribution of the respondents and Bulgarian population according to place of residence.

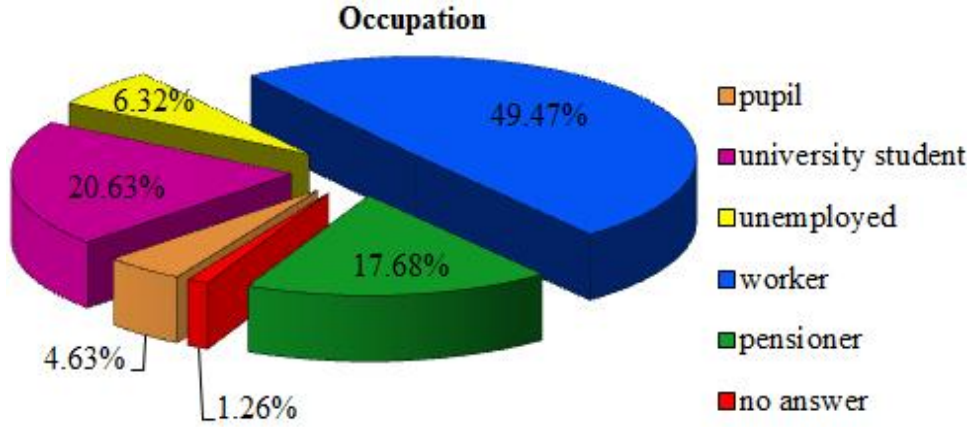

Figure 6. The distribution of the respondents according to occupation.

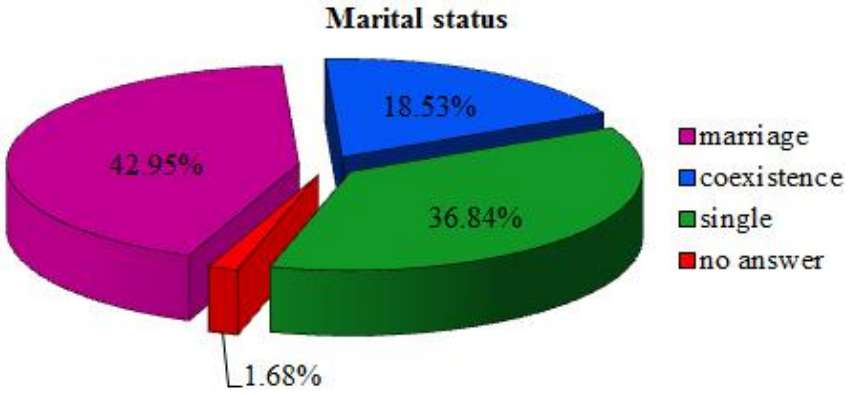

Figure 7. The distribution of the respondents according to marital status.

Table 1. Responses of the respondents to the inquiry.

S/N	Question	Responses	Number (%)
1	Do you think that herbs are beneficial for your health?	Yes	446 (93.89%)
		No	13 (2.74%)
		No answer	16 (3.37%)
2	How frequently do you use herbs? *	If necessary	248 (53.91%)
		Seasonally	58 (12.61%)
		Frequently	154 (33.48%)
3	For what purposes do you use herbs? *	Prophylaxis	112 (14.07%)
		Aromatherapy	39 (4.90%)
		Treatment	366 (45.98%)
		As spices	266 (33.42%)
		Ornamental	13 (1.63%)
4	From where do you obtain herbs:	Self-gathered from natural habitats	54 (11.37%)
		Purchased	189 (39.79%)
		Self-gathered or purchased	193 (40.63%)
		No answer	39 (8.21%)
5	From where do you purchase herbs:*	Pharmacy	296 (61.92%)
		Bazaar	80 (16.74%)
		Supermarket	102 (21.34%)

* The percent differs from 100% since more than one answer was marked.

(Figure 8). The lower percent of the respondents above 70 years, which believe in herbal medicines, could be explained by a generally poor health status in oldest age group. That might be a reason to lack a trust in possibilities to cure successfully diseases. Interestingly, the lowest positive attitudes towards herbs benefits were reported by informants at age 41 to 50. Further studies must be provided in order to explain this observation.

Responses to the questions “How frequently do you use herbs?” and "For what purposes do you use herbs?" could serve as an indicative of persistence of traditional knowledge in Bulgaria (Table 1). The frequency of herbal utilization reported confirmed existence of traditions of phytotherapy among Bulgarian population, since a larger proportion of the respondents declare to use herbs frequently and if necessary. About 60% of participants in the survey use medicinal plants for disease treatment and prophylaxis. Aromatherapy is reported to be used by 4.90% of respondents. It must be noticed that aromatherapy also is defined as a kind of complementary and alternative medicine (Pimenta, 2012). Herbs have been used for treatment and prevention of illness for centuries, but recently diminution of traditional knowledge has been established in some studies (Kozuharova et al., 2013). On the opposite of this statement, the results from our survey clearly demonstrated the persistence of local knowledge of herbal medicine in contemporary Bulgarian population. Herbs have been reported to be used as spices by 33.42% of respondents. According to Mann (2011) the terms “herb” and “spice” are often used interchangeably, since different parts of the medicinal plant are used as a spice: buds (cloves), bark (cinnamon), rhizomes or roots (ginger), berries (pepper), aromatic seeds (cumin) and even the stigma of a flower. This kind of herbal utilization is summarized by the well-known Hippocratic statement: "Let food be thy medicine and medicine be your food" (Hasler, 1998). A small proportion of interviewed people (1.63%) recognized herbs, but utilize them for ornamentation. Such utilization of medicinal plants has been reported in other studies (Bele et al, 2011).

The Bulgarian flora is remarkable for its diversity (Evstatieva et al., 2007) and the renewed interest in traditional medicine leads to increasing demand for medicinal plants. The most of the herbs are still gathered from wild habitats (Soetan and Aiyelaagbe, 2009; Verma et al., 2012). Nowadays, the necessity of medicinal plants conservation strategies has been widely discussed (Okigbo et al., 2008; Soetan and Aiyelaagbe, 2009). The actual information about abovementioned ecological aspects of herbal utilization in Bulgaria could be obtained from the responses to the question “From where do you obtain herbs?”. In our survey, only 11.37% of respondents reported to gather herbs from natural

Table 2. Influence of demographic variables of the respondents to their responses to the questions (n=475).

S/N	Question	Demographic variables											
		Sex		Age		Level of education		Occupation		Place of residence		Marital status	
		SD	r	SD	r	SD	r	SD	r	SD	r	SD	r
1	Do you think that herbs are beneficial for your health?	NS	0.09	S	0.37	NS	0.21	NS	0.18	S	0.21	NS	0.14
2	How frequently do you use herbs?	NS	0.09	NS	0.22	NS	0.19	NS	0.18	NS	0.08	NS	0.19
3	For what purposes do you use herbs?	NS	0.12	NS	0.19	NS	0.18	NS	0.19	S	0.19	NS	0.17
4	From where do you obtain herbs?	NS	0.17	S	0.37	S	0.3	NS	0.31	S	0.35	S	0.23
5	From where do you purchase herbs?	NS	0.12	NS	0.22	NS	0.12	NS	0.19	NS	0.05	NS	0.12

SD – Statistical difference between expected and observed frequencies; NS – Non significant; S – Significant; r – Pearson's contingency coefficient: 0 < r < 0.3 weak correlation, 0.3 < r < 0.5 moderate correlation.

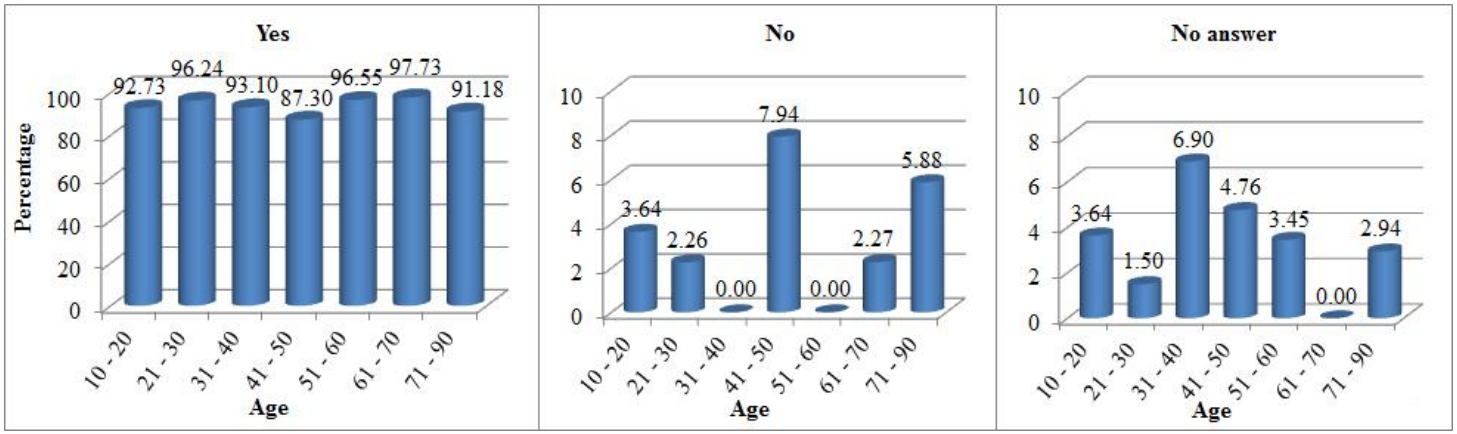

Figure 8. Cross-relationship between the demographic variable age of the respondents and their responses to the question "Do you think that herbs are beneficial for your health?".

habitats (Table 1). In similar study in Turkey (Akaydin et al., 2013) 52.8% of the informants reported to collect plant materials themselves from nature. The main reason for the significant difference in these observations is difference in number of rural inhabitants: 68.9% in the survey in Turkey and 27.50% in present survey. On the contrary, in the same study (Akaydin et al., 2013) only 21.1% preferred to purchase herbs, in comparison with 39.79% of Bulgarians which declared they prefer to purchase herbs. These results reveal impact of changes in modern Bulgarian society in terms of migration from rural to urban areas.

The data analysis shows impact of the demographic variables age and place of residence on responses to the question "From where do you obtain herbs?" (Table 2). Self-gathering is preferred

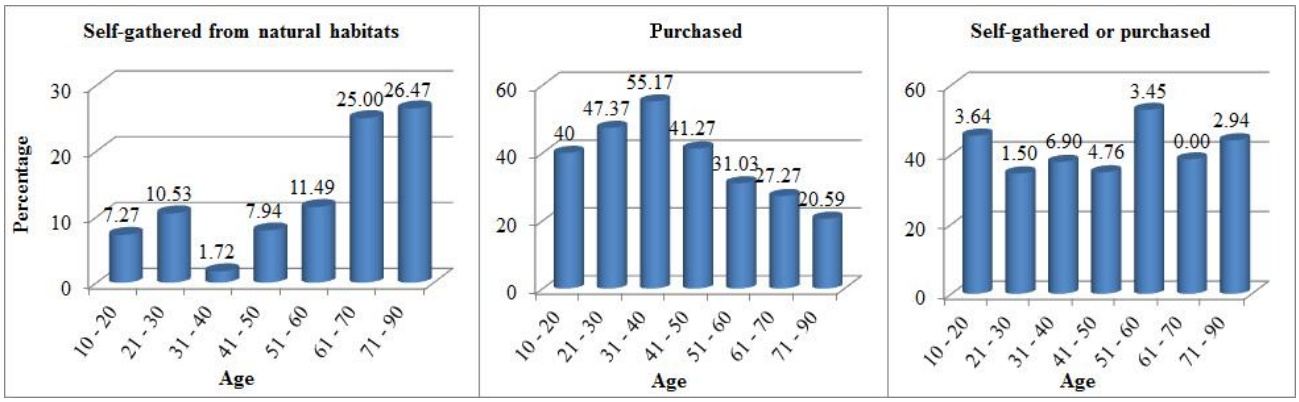

Figure 9. Cross-relationship between the demographic variable age of the respondents and their responses to the question "From where do you obtain herbs?".

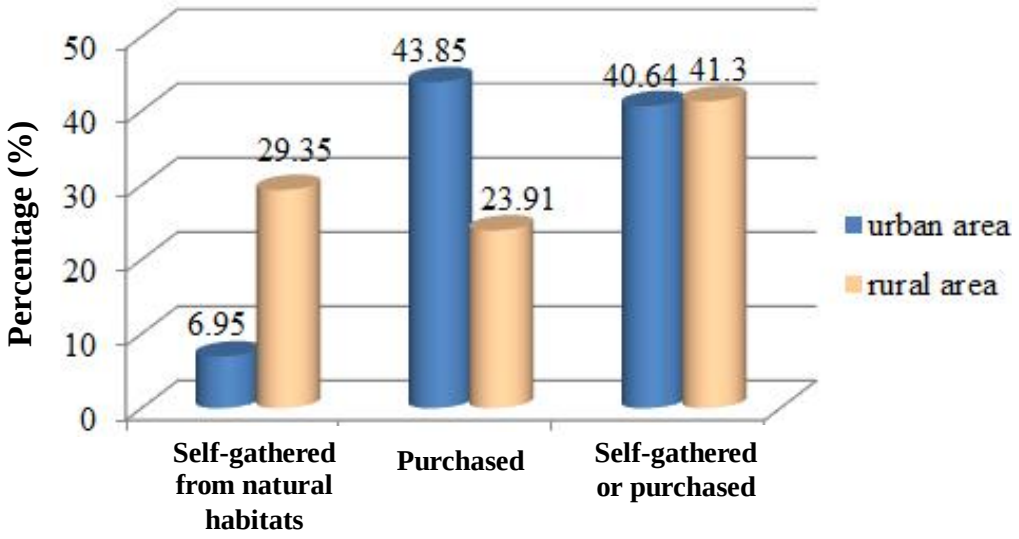

Figure 10. Cross-relationship between the demographic variable place of residence of the respondents and their responses to the question "From where do you obtain herbs?".

by the older respondents (Figure 9) and villagers (Figure 10). Further data analysis revealed that herbal gathering is preferred by the respondents with basic school education (25.00%), unemployed (23.33%) and pensioners (23.81%). It must be noticed that all of the abovementioned respondents belong to groups with low socio-economic status in Bulgaria.

The observation that the greatest proportion of respondents prefer to purchase herbs draws attention to the question "From where do you purchase herbs?" (Table 1). More than a half of the respondents (61.92%) prefer to buy herbs from the pharmacy. Supermarkets are the second preferred source (21.34%). Although, medicinal plants are available also at the traditional bazaars, they are the least preferred source (16.74%). A possible explanation to these results is the impact of modern society: nowadays people have faith in the pharmacies and supermarkets, where reputable and trustworthy firms sell their products.

Conclusion

Using data from a current nationally representative survey, we have examined the distribution of the attitudes toward benefits of medicinal plants, most popular application of herbs, manner of herbal obtaining and demographic factors associated with herbal use. The data obtained in the survey could reveal the contemporary status and critical points that need to be investigated in more details.

The results from present survey clearly show the persistence of traditional knowledge in contemporary Bulgarian population: about 94% of respondents believe

that herbs are useful for their health and about half of them use herbs for disease treatment and prevention. The impact of modern society is evident since only 11.37% of respondents obtain herbs themselves from natural habitats. A larger proportion of respondents prefer to purchase herbs from officially authorized sources as pharmacies and supermarkets. Demographic features exerted negligible influence on responses to the questionary. Only two demographics – age and place of residence exerted moderate influence on herbal utilization.

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Conflict of Interest

The authors have not declared any conflict of interest.

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