Someone to rely on: the impact of social support on self-perceived health in Slovene elderly

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Abstract
Introduction. Aiming at highlighting the importance of social networking for health of elderly, the association between social support and self-perceived health (SPH) was assessed in Slovenia.
Methods. Data from three consecutive cross-sectional surveys on health behaviour in Slovenia (2008, 2012 and 2016), for 4599 elderly, aged 65-75 years, were pooled. Association between poor SPH (PSPH) and social support (taking into account also existence of extended personal social network (EPSN)), adjusted for confounders, was analysed by multiple logistic regression.
Results. The PSPH odds were statistically significantly higher in single/divorced/living in extramarital partnership/widowed, all without EPSN (OR = 2.99; p = 0.005), and single/divorced with EPSN (OR = 1.49; p = 0.053) in comparison to married with EPSN.
Conclusion. Irrespective of gender, socio-economic status or health-related factors, elderly with low level of social support were more likely to perceive their health as poor/very poor. Public health measures to reduce isolation of elderly should be included in the action plan in the frame of the Longevity strategy.

INTRODUCTION

Today, it is broadly accepted that human health is a multidimensional concept. Although not in the forefront of the biomedical model, social dimension is important dimension of health, since humans are social beings. Additionally, this dimension makes an important contribution to other dimensions of health. The level of social health, which refers to building relationships, that enhance well-being, can be expressed in terms of the size and/or quality of the individual's social network. It is the ability to interact effectively with other people and the social environment, to develop satisfying interpersonal relationships and to fulfil social roles. Primary components of social health include social role participation, social network quality, social integration and interpersonal communication [1-3].

Social networks represent the net of social relationships that each person maintains. They can have an intimate character, e.g. relationships within family or close friends, or more formal character, e.g. relationships in the workplace [4, 5]. The impact of social networks on patterns of morbidity and mortality has been the focus of interest for many researchers since the mid-1970s [4, 6-11]. The results of many studies suggest that without social networks, health in general declines [1, 8-11]. Social networks influence health through multiple pathways: behavioural, and material, psychological and physiological. Extensive social networks might increase the likelihood that individuals engage in health-promoting behaviours or refrain from health-damaging ones. Individuals with strong social networks experiencing health problems receive advice, service, or material help from others earlier and thus benefit from better medical and other care [1-14]. Social isolation has the most negative effect on health [15].

An extra quality in the social networking, in terms people in the network feel to have obligations one to another, is social support [16]. In theory, social support involves exchange of emotional support, and information and instrumental assistance [17], and is probably the central health-enhancing aspect of relationships [18]. In this concept, care, attention, and readiness to help other people in the network is included. Thus, it does not mean that someone's network necessarily provides a social support by itself – some of ties within a social network are supportive in terms of offering various sources of help and resources, and the others are not [19]. However, if the network is larger, there is a

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greater chance that at least some ties will be supportive.

Among the population groups in which the social dimension of health has an important role, are the elderly [20-22]. They have a high risk of social isolation because of the inevitable experience of loss of significant others and decrease in social activity [21]. Elderly more likely experience health problems, which increases their need for social support and companionship [15]. With the population aging, social isolation of the elderly becomes an important problem to tackle. Strategies for promoting healthy and active aging have become a major component of health policy in the developed countries [23].

So far, there have been only two studies in Slovenia in which the relationship between health and social networks of individuals was studied to the certain extent. The first study was the ecological study which explored the role of different social networks in providing support during illness, with special emphasis on changes in the provision of social support to the elderly. The results showed that in this population group, in comparison to other age groups, important source of social support, beside close family, represented extended family and neighbours [24]. The second study was focused on major determinants of poor self-rated health in elderly population in urban areas in Slovenia, Lithuania and UK. Living alone was significantly associated with poor self-rated health only in Slovenia [25]. However, none of these two studies provided sufficient information for planning of comprehensive health promotion activities in Slovenia.

In the present study we approached the task of highlighting the importance of social support for health of elderly more from a public health rather than sociological perspective. In July 2018, the Longevity strategy was adopted in Slovenia and action plans containing proposals of concrete solutions for the realisation of the guidelines are expected to follow. Because of the complexity of the topic, different sectors will be involved in the process – Ministry of Labour, Family, Social Affairs and Equal Opportunities, Ministry of Education, Science and Sport, Ministry of Health and Ministry of the Environment and Spatial Planning [26]. With the purpose to emphasize the importance of social support for healthy aging in the process of developing the action plan for Longevity strategy in Slovenia, the objective of the study was to assess the association of social support and self-perceived health (SPH) in Slovenian elderly.

METHODS
Study design
The study was designed as a pooled individual-level data study. Data were collected in three cross-sectional surveys on health behaviours in adult population aged 25-74 years, conducted in 2008, 2012 and 2016, based in the frame of the Countrywide Integrated Non-Communicable Disease Intervention (CINDI) programme [27] in Slovenia. The methodology of CINDI Health Monitor (CHM) survey (health interview survey) was used [28]. The CHM survey is based on a common core questionnaire. Questions are categorised as obligatory and optional and countries can add their local questions, based on the local situation and needs.

After translation, the questionnaire was tested in local conditions [28]. A random representative sample of the population was provided by the national statistics office. The number of invited in 2008 was 15 963 while in 2012 and 2016 it was 16 000.

Study instrument
A self-administered postal questionnaire, based on the CHM Core Questionnaire [28] and slightly adapted for the needs of the population of Slovenia, was used as the instrument. In 2012 and 2016, an online questionnaire was also applied. To increase the response rate, media campaigns, incentives encouraging healthy behaviour, and up to two reminder letters, were used.

Observed outcome
In this study, SPH was assessed through the question: "How do you assess your present state of general health?" (1 = very good; 2 = good; 3 = fair; 4 = poor, 5 = very poor). As the observed outcome it was decided self-perceived health rated as poor or very poor. Consequently, a new variable, called "poor self-perceived health" (PSPH) was created (PSPH: 0 = no, 1 = yes).

Explanatory factor
In assessing social support of individuals, a new variable was created by cross-classification of two questions, asking about their marital status and extended personal social network (EPSN) (extended family and extra-familiar social network). Participants reported their marital status as 1 = single, 2 = married, 3 = extra-marital partnership, 4 = widowed or 5 = divorced. EPSN was assessed on the basis of question "How many friends do you have, which you can visit any time without an invitation?" in 2008 (1 = a lot, 2 = many, 3 = some, 4 = one, 5 = none) and "How many persons are close enough to you to rely on, when you have a serious personal problem?" in 2012 and 2016 (1 = none, 2=1-2, 3 = 3-5, 4= more than 5). Due to discrepancies in categories, the EPSN status was reduced only to existence of EPSN (EPSN: 0 = no, 1 = yes). EPSN = 0 covered those, who answered "none" in all 3 surveys and EPSN = 1 covered those, who selected any other answer ("a lot", "many", "some", "one" in 2008 and "1-2", "3-5", "more than 5" in 2012 and 2016). Afterwards, both marital status and EPSN were on the basis of results of preparatory analysis of our dataset and findings of previous research on marital status and health [29-32] combined into a complex variable, called "social support", with four categories (1 = married with EPSN, 2 = married without EPSN/widowed with EPSN/living in extramarital partnership with EPSN, 3 = single with EPSN/divorced with EPSN, 4 = single without EPSN/living in extramarital partnership without EPSN/widowed without EPSN/divorced without EPSN), for which it was assumed that the highest level of social support is provided within the first category, and the lowest within the last category.

Confounding factors
As potential confounders self-reported demographic and socio-economic data, data on stress and morbidity, as well as region of residency and year of the study

were included in the analysis. After harmonization of variables and their categories between all three cross-sectional studies following confounders were considered: gender (1 = female, 2 = male), educational level (1 = incomplete primary/primary, 2 = vocational, 3 = secondary, 4 = college, 5 = university/postgraduate), employment (1 = employed, 2 = retired), social class (1 = lower/labour, 2 = middle, 3=upper-middle/upper), admission to the hospital in the last year (1 = none, 2 = once, 3 = multiple times), health problems in the last 30 days - chest pain during physical activity, back pain, neck/shoulder pain, joint pain, coughing, legs swelling, allergies, constipation, headache, insomnia, feeling depressed, toothache and problems with urinating (1 = none, 2 =≥ 1), health status (number of diseases diagnosed by a physician) - hypertension, hypercholesterolemia, diabetes, myocardial infarction, angina pectoris, heart failure, cerebrovascular insult, spine illness, joint illness, chronic bronchitis, asthma, stomach ulcer, liver cirrhosis, depression and thyroid disorder (1 = none, 2 =≥ 1), perception of tension/stress/heavy pressure with at least minor difficulties in coping (1 = no, 2 = yes), region of residency (1 = Nova Gorica, 2 = Koper, 3 = Kranj, 4 = Ljubljana, 5 = Ravne na Koroškem, 6 = Novo mesto, 7 = Celje, 8 = Maribor, 9 = Murska Sobota) and year of the survey (1 = 2008, 2 = 2012, 3 = 2016).

Statistical analysis

The association between PSPH and social support as explanatory factor was assessed first by univariate analysis, using chi-square test. Afterwards it was adjusted for confounders by using binary multiple logistic regression analysis. Dummy variables were created for explanatory and confounding variables, applying the simple method (one group was assigned as the reference group). In all statistical tests, $p \leq 0.05$ was considered significant. SPSS for Windows Version 21.0 (SPSS Inc., Chicago, IL., USA) was used for analysis.

RESULTS
Description of the study group

There were 25 440 participants in the initial pooled data-base (2008: 7352, 2012: 9498, 2016: 8590), whose questionnaires were eligible for analysis (the response rate was 49.0% in 2008, 59.6% in 2012 and 54.9% in 2016). Among them 4599 participants were aged 65-74 years (2008: 1280, 2012: 1741, 2016: 1578) and were eligible for the present study. There was a slight predominance of women versus men (55.8% and 44.2%, respectively). Other study group characteristics are presented in the *Table 1*.

Results of univariate analysis

SPH was reported by 4524/4599 participants (98.4%), of which 3.8% reported very good SPH, 29.3% good SPH, 54.2% fair SPH, 10.7% poor SPH, and 2% reported very poor SPH. The prevalence of very good and good and fair SPH was higher in people with existing EPSN, whereas the prevalence of poor and very poor SPH was higher in those who were socially isolated *(Table 1)*.

After cross-matching of SPH with explanatory factor,

4417/4599 (96.0%) cases were included in the analysis *(Table 2)*. The prevalence of PSPH was increasing through the categories of social support variable and was three times as high in single or divorced or widowed or living in extramarital partnership, all without EPSN (33.3%), as in married with EPSN (11.2%). Prevalence of PSPH was 14.3% in married without EPSN or widowed with EPSN or living in extramarital partnership with EPSN and 15.4% in single with EPSN or divorced with EPSN. The differences were highly statistically significant ($p < 0.001$). The estimates of prevalence of PSPH according to different socio-economic and health-related characteristics are presented in the *Table 3*, along with the results of univariate statistical analysis.

Results of multiple logistic regression analysis

Complete data for multiple logistic regression analysis were available for 3328/4599 participants (72.4%). The results of the logistic regression model revealed a statistically significant association between PSPH and social support, also when this relationship was adjusted to several confounders. The OR for PSPH was increasing through the social support categories and was significant for single or divorced or living in extramarital partnership or widowed elderly, all without EPSN, and marginally significant for single or divorced elderly with EPSN, in comparison with married with EPSN. Detailed results are presented in the *Table 4*.

DISCUSSION
Major findings of the study

We investigated the association of social support and PSPH in the Slovenian elderly. The analysis revealed that, married elderly, who besides family also have EPSN, assess their health as very good, good or fair, while divorced or single or elderly living in extramarital partnership or widowed elderly, all without EPSN, rate their health as poor or very poor. It seems that single and divorced elderly with EPSN are also more likely to rate their health as poor in comparison with married with EPSN, but the difference is marginally significant. The difference was not statistically significant for married without EPSN, widowed with EPSN or elderly living in an extramarital partnership with EPSN compared to married with EPSN. The survey question in the present study was designed in a way which allowed us to identify those EPSNs, which are perceived by the participants as supportive. SPH was used as an outcome because it is one of the most commonly used measures of perceived overall health. It is easily available and reliable and it is also recommended to use for health monitoring by the European Union Commission and the WHO [33, 34].

Comparison of the results to the results of similar studies

The findings are consistent with previous studies that have proved the importance of social networks in determining SPH among older adults. Similar to our findings, White et al demonstrated adequate emotional support is associated with better self-reported health status in later life [35]. Elderly face a number of chal-

Table 1
Characteristics of participants taking part in the study of the impact of social support on self-perceived health in elderly aged 65-75; pooled individual level data from three cross-sectional studies in Slovenia 2008-2016

Characteristic	Category	N (%)
SPH	Very good	170 (3.8)
	Good	1326 (29.3)
	Fair	2454 (54.2)
	Poor	483 (10.7)
	Very poor	91 (2.0)
PSPH	Yes	574 (12.7)
	No	3950 (87.3)
Social support	Married with EPSN	2964 (66.2)
	Married without EPSN/widowed with EPSN/living in extramarital partnership with EPSN	1046 (23.4)
	Single with EPSN/divorced with EPSN	395 (8.8)
	Single without EPSN/living in extramarital partnership without EPSN/widowed without EPSN/divorced without EPSN	74 (1.7)
Gender	Men	2035 (44.2)
	Women	2564 (55.8)
Educational level	Incomplete primary/primary	1400 (30.8)
	Vocational	1018 (22.4)
	Secondary	1273 (28.0)
	College	439 (9.7)
	University/postgraduate	412 (9.1)
Employment	Employed	135 (3.0)
	Retired	4395 (97.0)
Social class	Lower/labour	1597 (38.0)
	Middle	2218 (52.8)
	Upper-middle/upper	389 (9.3)
Admission to hospital in the last year	No	3562 (81.0)
	Once	601 (13.7)
	Multiple times	233 (5.3)
Health problems in the last 30 days	None	657 (14.9)
	≥ 1	3755 (85.1)
Number of health problems*	None	761 (16.5)
	≥ 1	3583 (77.9)
Perception of stress with coping difficulties	No	3737 (86.4)
	Yes	586 (13.6)
Region	Nova Gorica	228 (5.0)
	Koper	331 (7.2)
	Kranj	501 (10.9)
	Ljubljana	1339 (29.1)
	Ravne	175 (3.8)
	Novo mesto	309 (6.7)
	Celje	690 (15.0)
	Maribor	734 (16.0)
	Murska Sobota	292 (6.3)
Year	2008	1280 (27.8)
	2012	1741 (37.9)
	2016	1578 (34.3)

SPH = self-perceived health; PSPH = poor self-perceived health; EPSN = extended personal social network (extended family + extra-familiar social network); * = confirmed by a physician.

Table 2
Estimates of prevalence of self-perceived health (SPH) within categories of social support in elderly aged 65-75; pooled individual level data from three cross-sectional studies in Slovenia 2008-2016

		SPH N (%)					
		Very good	**Good**	**Fair**	**Poor**	**Very poor**	**Total**
Social support	Married with EPSN	113 (3.9)	909 (31.1)	1574 (53.8)	289 (9.9)	40 (1.4)	2925 (100)
	Married without EPSN/widowed with EPSN/ living in extramarital partnership with EPSN	27 (2.6)	254 (24.7)	602 (58.4)	116 (11.3)	31 (3.0)	1030 (100)
	Single with EPSN/divorced with EPSN	27 (6.9)	123 (31.5)	180 (46.2)	52 (13.3)	8 (2.1)	390 (100)
	Single without EPSN/living in extramarital partnership without EPSN/widowed without EPSN/ divorced without EPSN	0 (0.0)	13 (18.1)	35 (48.6)	16 (22.2)	8 (11.1)	72 (100)
	Total	167	1299	2391	473	87	4417

EPSN = extended personal social network (extended family + extra-familiar social network).

lenges to remain socially connected. Life changes, such as retirement and loss of a spouse (widowhood), may lead to a loss of social roles and possible social isolation [15]. Marriage is one of the most fundamental and intimate ties among people. Grundy et al showed that those in long-term marriages had lower odds for chronic illness and lower mortality, which was especially true for older men [36]. Those who are not married, whether single, separated, widowed, or divorced, experience higher mortality rates than married people [13, 37]. A meta-analysis of studies of marital status and mortality in elderly age groups reported mortality risks for the widowed and never-married both about 10% higher than for the married [38]. Close friends are another important source of social support. But number of friends doesn't necessarily reflect the amount of support of an individual [13]. Our study incorporated close family as well as extended network of friends in the analysis, which are the most common sources of social support of individuals.

Limitations and strengths of the study

We are aware that the present study has some limitations. Firstly, CHMS is a cross-sectional dataset and any conclusions about causality drawn from the data are limited. A longitudinal data set would allow analyses of the relationship between social network and SPH over time. Secondly, because of collecting data through a self-administered self-assessment questionnaire, one may argue that the resulting data might be biased. However, these limitations present themselves in many surveys and the authors believe they did not affect the study findings to a greater extent [39, 40]. Next, because of the questionnaire changing over time, there were some issues with extracting the data on the same subjects from three different surveys. The wording in two questions assessing EPSN was quite different, but the context was very similar. In 2012 and 2016 the question is phrased in a way to address close family network and also extended family and friends' network. Since there is already a question about close family network in the questionnaire, we assumed participants were assessing their EPSNs here. The ques-

tion should be rephrased in the future surveys. Next, we did not have any information on whether participants are living together with the people they identified as family members and this should be included in future research. Next, in assessing employment status, we removed those, who answered "unemployed", since adults in Slovenia aged 65 years and over are mostly retired, very few are still working, but there is no explanation, other than misunderstanding the question, why their status would be "unemployed". Next, some overlaps in participants across the surveys in three different years might be possible. However, only about 6% of adult population, aged 25-75 years, was invited to participate in each survey. The chance that the same person was included in all studies is therefore minute. Finally, one can argue that the possible interactions between different factors included in the multivariate model were not explored in details. However, a more detailed analysis was beyond the scope of this study.

On the other side the study has some important strengths. The most important is that to assess social support, a complex indicator was used. Considering both familiar and extended social ties, this is a special feature of the present study and it is what distinguishes it from other similar studies. Hence, present study contributes to understanding importance of social support on health in the later life in Slovenia, as well as in countries with similar socio-economic conditions and transition problems in the region. Additionally, in comparison to other two previously mentioned studies on the topic in Slovenia, the present study was performed on a large, nationally representative population-based data.

Importance of the study for public health

The results of the study are directly applicable in public health in Slovenia. First important information is that in the observed population the observed phenomenon was in the last decade rather stable. Next important information is that in the Novo mesto, Celje and Maribor regions the odds for perception of SPH as poor/very poor are significantly higher than in the reference region. This means there are additional risk factors

Table 3
Estimates of prevalence of poor self-perceived health (PSPH) within categories of social support and selected socio-economic and health-related factors in a study of the impact of social support on self-perceived health in elderly aged 65-75; pooled individual level data from three cross-sectional studies in Slovenia 2008-2016

Risk factor	Category	N_{PSPH}/N_{cat} (%)	p
Gender	Women	342/2524 (13.5)	0.050
	Men	232/2000 (11.6)	
Educational level	Incomplete primary/primary	280/1378 (20.3)	< 0.001
	Vocational	110/1004 (11.0)	
	Secondary	117/1249 (9.4)	
	College	40/433 (9.2)	
	University/postgraduate	16/406 (3.9)	
Employment	Employed	14/132 (10.6)	0.495
	Retired	545/4324 (12.6)	
Social class	Lower/labour	314/1578 (19.9)	< 0.001
	Middle	191/2180 (8.8)	
	Upper-middle/upper	12/383 (3.1)	
Admission to hospital in the last year	No	341/3509 (9.7)	< 0.001
	Once	111/590 (18.8)	
	Multiple times	90/230 (39.1)	
Health problems in the last 30 days	None	37/616 (6.0)	< 0.001
	≥ 1	505/3724 (13.6)	
Number of health problems*	None	48/712 (6.7)	< 0.001
	≥ 1	492/3560 (13.8)	
Perception of stress with coping difficulties	No	321/3684 (8.7)	< 0.001
	Yes	213/578 (36.9)	
Region	Nova Gorica	29/226 (12.8)	< 0.001
	Koper	33/329 (10.0)	
	Kranj	45/492 (9.1)	
	Ljubljana	122/1309 (9.3)	
	Ravne	23/174 (13.2)	
	Novo mesto	51/302 (16.9)	
	Celje	116/682 (17.0)	
	Maribor	108/720 (15.0)	
	Murska Sobota	47/290 (16.2)	
Year	2008	189/1267 (14.9)	0.009
	2012	216/1728 (12.5)	
	2016	169/1529 (11.1)	

EPSN = extended personal social network (extended family + extra-familiar social network); * = confirmed by a physician.

in these regions which need to be studied. Our findings also have important implications for clinical practice. Elderly who often feel under a lot of pressure and have difficulties in coping with stress represent a high risk group. Physicians, who often treat mental health problems like anxiety and depression with medications, should be aware of the importance of social health of their elderly patients. This holds for patients with chronic conditions, or patients being discharged from the hospital, as they have significantly higher odds of rating their health as poor in the present study. Finally,

the findings of this study could be also important for health care personnel taking care of patients in need of palliative care [41].

Possibilities for future studying of the issue
Despite the important contribution of this study, more research is needed to specify the underlining characteristics of social networks affecting health in the elderly in Slovenia. Firstly, additional more in-depth analysis should be conducted in terms of stratified analysis to investigate the effect of each factor across the strata

Table 4
Results of multiple logistic regression analysis of the association between poor self-perceived health (PSPH) and social support in a study of the impact of social support on self-perceived health in elderly aged 65-75; pooled individual level data from three cross-sectional studies in Slovenia 2008-2016

Risk factor	Category	OR (95% CI for OR)	p
Social support	Married with EPSN	1.00	
	Married without EPSN/widowed with EPSN/living in extramarital partnership with EPSN	1.19 (0.89-1.58)	0.235
	Single with EPSN/divorced with EPSN	1.49 (0.99-2.22)	0.053
	Single without EPSN/living in extramarital partnership without EPSN/widowed without EPSN/divorced without EPSN	2.99 (1.39-6.43)	0.005
Gender	Women	1.00	
	Men	1.16 (0.90-1.50)	0.245
Educational level	University/postgraduate	1.00	
	Incomplete primary/primary	2.76 (1.25-6.08)	0.012
	Vocational	1.72 (0.78-3.79)	0.176
	Secondary	1.75 (0.81-3.76)	0.153
	College	2.00 (0.89-4.50)	0.096
Employment	Employed	1.00	
	Retired	1.32 (0.67-2.60)	0.422
Social class	Upper-middle/upper	1.00	
	Lower/labour	4.07 (1.85-8.94)	< 0.001
	Middle	2.10 (1.00-4.44)	0.052
Admission to hospital in the last year	No	1.00	
	Once	1.94 (1.44-2.61)	< 0.001
	Multiple times	6.05 (4.18-8.77)	< 0.001
Health problems in the last 30 days	None	1.00	
	≥1	1.87 (1.18-2.97)	0.008
Number of health problems*	None	1.00	
	≥1	1.65 (1.08-2.51)	0.020
Perception of stress with coping difficulties	No	1.00	
	Yes	4.84 (3.73-6.28)	< 0.001
Region	Kranj	1.00	
	Nova Gorica	1.38 (0.71-2.67)	0.343
	Koper	1.14 (0.61-2.12)	0.681
	Ljubljana	1.64 (0.82-3.28)	0.158
	Ravne	1.74 (0.96-3.16)	0.068
	Novo mesto	2.02 (1.23-3.31)	0.006
	Celje	2.06 (1.25-3.38)	0.004
	Maribor	2.02 (1.13-3.60)	0.017
	Murska Sobota	1.64 (0.82-3.28)	0.158
Year	2012	1.00	
	2008	1.25 (0.95-1.66)	0.115
	2016	1.18 (0.88-1.58)	0.278

EPSN = extended personal social network (extended family + extra-familiar social network); * = confirmed by a physician.

of each other factor, and in the case of existing interactions, it would be necessary to include those interaction effects in the multivariate model to test the possible interplay of selected variables with the variable "social support". Adding interaction terms to a simple additive regression model could greatly expand understanding of the relationships among variables, allow more hypotheses to be tested and, provide more effective information for policy makers as of the present work. Next, as previous studies have shown that both struc-

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tural (number, density and diversity of social ties) and functional (quality of social ties – providing emotional, financial and informational support) dimension of social relations are linked to health [35], future research should focus on investigating the quality of existing social networks in the elderly in Slovenia and not just quantity of social ties. Special instruments should be used for this purpose, e.g. the Multidimensional Scale of Perceived Social Support (MSPSS) [42, 43]. Another important research area is the obstacles for the elderly for a satisfactory social activity and how to tackle them. Our study shows that 1.7% of elderly in Slovenia have no close ties among either relatives or nonrelatives. The reasons for social isolation must be determined and targeted with specific public health interventions. For future research and for studying trends, it is essential not to alter the questionnaires significantly, since it is not possible to compare results. Further studies are required to determine the causality of the association between social support and SPH.

CONCLUSIONS

Strong evidence regarding association between social support and SPH exist and our study contributes to the body of evidence. The present study confirms that social support in the elderly on an individual level is an important contributor to healthy aging. As the population in Slovenia is aging, this should be kept in mind when planning public health strategies and action plans to promote healthy aging. Unmarried elderly with no EPSN are especially at risk and tackling social isolation of the elderly with the identified risk factors should be high on the list of political priorities.

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Ethical approval

The research protocol was approved for the CINDI Health Monitor surveys by the Ethical Committee of the Republic of Slovenia.

Conflict of interest statement

The authors declare no conflicts of interest.

REFERENCES

1. Hjelm JR. The dimensions of health: conceptual models. Sudbury, MA: Jones and Bartlett; 2010.
2. Hales D. An invitation to health. Belmont, CA: Wadsworth Cengage Learning; 2009.
3. Hahn EA, DeVellis RF, Bode RK, Garcia SF, Castel LD, Eisen SV. Measuring social health in the patient-reported outcomes measurement information system (PROMIS): item bank development and testing. Qual Life Res. 2010;19(7):1035-44. doi: 10.1007/s11136-010-9654-0
4. Seeman TE. Social ties and health: the benefits of social integration. Ann Epidemiol. 1996;6(5):442-51. doi: 10.1016/S1047-2797(96)00095-6
5. Bugental DB. Acquisition of the algorithms of social life: a domain-based approach. Psychol Bull. 2000;126(2):187-219. doi: 10.1037//0033-2909.126.2.187
6. Berkman LF. Social support, social networks, social cohesion and health. Soc Work Health Care. 2008;31(2):3-14. doi: 10.1300/J010v31n02_02
7. Helweg-Larsen M, Kjøller M, Thoning H. Do age and social relations moderate the relationship between self-rated health and mortality among adult Danes? Soc Sci Med. 2003;57(7):1237-47. doi: 10.1016/S0277-9536(02)00504-X
8. Nummela O, Sulander T, Karisto A, Uutela A. Self-rated health and social capital among aging people across the urban-rural dimension. Int J Behav Med. 2009;16(2):189-94. doi: 10.1007/s12529-008-9027-z
9. Kawachi I, Kennedy BP, Glass R. Social capital and self-rated health: a contextual analysis. Am J Public Health. 1999;89(8):1187-93. doi: 10.2105/AJPH.89.8.1187
10. Subramanian SV, Kim DJ, Kawachi I. Social trust and self-rated health in US communities: a multilevel analysis. J Urban Heal. 2002;79(Suppl. 1):S21-34. doi: 10.1093/jurban/79.suppl_1.S21
11. Waverijn G, Wolfe MK, Mohnen S, Rijken M, Spreeuwenberg P, Groenewegen P. A prospective analysis of the effect of neighborhood and individual social capital on changes in self-rated health of people with chronic illness. BMC Public Health. 2014;14:675. doi: 10.1186/1471-2458-14-675
12. Djomba JK, Zaletel-Kragelj L. A methodological approach to the analysis of egocentric social networks in public health research: a practical example. Zdr Varst. 2016;55(4):256-63. doi: 10.1515/sjph-2016-0035
13. Berkman LF. Assessing the physical health effects of social networks and social support. Annu Rev Public Health. 1984;5:513-32. doi: 10.1146/annurev.pu.05.050184.002213
14. Berkman LF, Glass T, Brissette I, Seeman TE. From social integration to health: Durkheim in the new millennium. Soc Sci Med. 2000;51(6):843-57. doi: 10.1016/S0277-9536(00)00065-4
15. Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. J Health Soc Behav. 2009;50(1):31-48. doi: 10.1177/002214650905000103
16. Donev D, Pavlekovic G, Zaletel Kragelj L. Social networks and social support in health promotion programmes. In: Donev D, Pavlekovic G, Zaletel Kragelj L (Eds). Health promotion and disease prevention: a handbook for teachers, researchers, health professionals and decision makers: stability pact for South Eastern Europe. Lage: Hans Jacobs publishing company; 2007. pp. 125-36.
17. Ahrens W, Pigeot I (Eds). Handbook of epidemiology. New York: Springer-Verlag New York; 2005.
18. House JS. Work, stress and social support. Reading, MA: Addison-Wesley; 1981.
19. Fillit H, Rockwood K, Woodhouse KW. Brocklehurst's textbook of geriatric medicine and gerontology. Philadelphia: Saunders; 2010.
20. Barnes M, Blom A, Cox K, Lessof C. The social exclusion of older people: evidence from the first wave of the English Longitudinal Study of Ageing (ELSA): final report. London: Office of the Deputy Prime Minister; 2006.

21. Victor C, Scambler S, Bond J, Bowling A. Loneliness, social isolation and living alone in later life. Rev Clin Gerontol. 2000;10(4):407-17. doi: 10.1017/S0959259800104101

22. Berkman LF. The role of social relations in health promotion. Psychosom Med. 1995;57(3):245-54. doi: 10.1097/00006842-199505000-00006

23. Hawton A, Green C, Dickens AP, Richards SH, Taylor RS, Edwards R, et al. The impact of social isolation on the health status and health-related quality of life of older people. Qual Life Res. 2011;20(1):57-67. doi: 10.1007/s11136-010-9717-2

24. Pahor M, Hlebec V. Socialna omrežja in zdravje: spremembe v Sloveniji. Zdr Varst. 2006;45(4):175-185.

25. Stanojevic Jerkovic O, Sauliune S, Šumskas L, Birt CA, Kersnik J. Determinants of self-rated health in elderly populations in urban areas in Slovenia, Lithuania and UK: findings of the EURO-URHIS 2 survey. Eur J Public Health. 2017;27(Suppl. 2):74-9. doi: 10.1093/eurpub/ckv097

26. Government of the Republic of Slovenia. Longevity strategy in Slovenia. 2017. Available from: www.vlada.si/teme_in_projekti/strategija_dolgozive_druzbe/.

27. World Health Organization. Protocol and Guidelines: Countrywide Integrated Noncommunicable Diseases Intervention (CINDI) Programme. Copenhagen: WHO Regional Office for Europe; 1995.

28. Prättälä R, Helasoja V, Laaksonen M, Laatikainen T, Nikander P, Puska P. Cindi Health Monitor. Proposal for practical guidelines. Publications of the National Public Health Institute. Helsinki: WHO Regional Office for Europe; 2001.

29. Brown SL, Kawamura S. Relationship quality among cohabitors and marrieds in older adulthood. Soc Sci Res. 2010;39(5):777-86. doi:10.1016/j.ssresearch.2010.04.010

30. Noel-Miller CM. Partner caregiving in older cohabiting couples. J Gerontol B Psychol Sci Soc Sci. 2011;66B(3):341-53. doi:10.1093/geronb/gbr027

31. Robards J, Evandrou M, Falkingham J, Vlachantoni A. Marital status, health and mortality. Maturitas. 2012;73(4):295-9. doi:10.1016/j.maturitas.2012.08.007

32. Brown SL, Wright MR. Marriage, cohabitation, and divorce in later life. Innov Aging. 2017;1(2):1-11.

doi:10.1093/geroni/igx015

33. Mackenbach JP, Van Den Bos J, Joung IMA, Van De Mheen H, Stronks K. The determinants of excellent health: different from the determinants of ill-health? Int J Epidemiol. 1994;23(6):1273-81. doi: 10.1093/ije/23.6.1273

34. Manderbacka K. Examining what self-rated health question is understood to mean by respondents. Scand J Public Health. 1998;26(2):145-53. doi: 10.1177/14034948980260020301

35. White AM, Philogene S, Fine, L, Sinha S. Social support and self-reported health status of older adults in the United States. Am J Public Health. 2009;99(10):1872-8. doi: 10.2105/AJPH.2008.146894

36. Grundy EMD, Tomassini C. Marital history, health and mortality among older men and women in England and Wales. BMC Public Health. 2010;10:554. doi:10.1186/1471-2458-10-554

37. Robards J, Evandrou M, Falkingham J, Vlachantoni A. Marital status, health, and mortality. Maturitas. 2012;73(4):295-9. doi: 10.1016/j.maturitas.2012.08.007

38. Manzoli L, Villari P, Pirone MG, Boccia A. Marital status and mortality in the elderly: a systematic review and meta-analysis. Soc Sci Med. 2007;64(1):77-94. doi: 10.1016/j.socscimed.2006.08.031

39. Farkas J, Pahor M, Zaletel-Kragelj L. Self-rated health in different social classes of Slovenian adult population: nationwide cross-sectional study. Int J Public Health. 2011;56(1):45-54. doi: 10.1007/s00038-009-0103-1

40. Ranfl M, Zaletel-Kragelj L. Assessment of the association between dentate status and self-rated general health. Zdr Varst. 2017;56(2):131-9. doi: 10.1515/sjph-2017-0017

41. Klok L, Engels Y, Veldhoven C, Rotar Pavlic D. Early identification of patients in need of palliative care in Slovenian general practice. Zdr Varst. 2018;57(2):55-64. doi: 10.2478/sjph-2018-0008

42. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. J Pers Assess. 1988;52:30-41.

43. De Maria M, Vellone E, Durante A, Biagioli V, Matarese M. Psychometric evaluation of the multidimensional scale of perceived social support (MSPSS) in people with chronic diseases. Ann Ist Super Sanita. 2018;54(4):308-15. doi: 10.4415/ANN_18_04_07