

## Teaching Dementia in Secondary Schools to Create Dementia Friendly Generation

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### ABSTRACT

*By educating non-health related students about dementia too, we can create a generation that is more supportive of people with dementia in the community where they live. The aim of the study was to evaluate knowledge of dementia and attitudes towards people with dementia among Slovenian non-health related students. A total of 1128 students (68.3 % of girls) aged 16.0 years in average (aged between 14 and 19 years) completed the questionnaire. Out of 20 questions and supplementary questions on dementia knowledge, participants were on average able to answer more than fourteen correctly. Respondents differed significantly on three sources. Respondents with relatives with dementia reported higher knowledge, boys reported lower levels of knowledge than girls, and students of secondary technical and vocational school, and of general secondary schools (grammar-school) scored significantly higher on the knowledge questionnaire comparison to students of lower vocational and secondary vocational schools. The results of research provide sources for further research about gender specific educational interventions and active inclusion of students with relatives with dementia in education which could improve general exposure of problem and gaining of knowledge for appropriate treatment.*

### Keywords

Dementia knowledge, Attitudes towards people with dementia, Students, Stigma, Education on dementia.

### Introduction

Longer life expectancy is increasing the number of people with dementia [1,2]. Due to the aging of the population, dementia is also becoming more common in Slovenia and represents an increasing public health and social challenge [3]. Pirtošek [4] states that there are currently around 33,000 people with dementia in Slovenia. It becomes common to know someone with dementia or to face dementia in one's own family.

Dementia is a term for set of symptoms resulting from a brain disease, usually of chronic or progressive nature [5]. It is manifested by disturbances of many higher nervous activities, such

as memory, thinking, orientation, recognition, comprehension, the ability to learn, and the ability to express verbally. The decline of these activities affects daily life and reduces the ability to control emotions, relationships and motivation [6]. There are over 200 different causes of dementia. According to the World Health Organization [2], the most common cause of dementia is Alzheimer's disease, which most often begins after age 65 and its incidence increases rapidly with age. Dementia usually begins gradually with memory impairment for recent events, with poorer time orientation and becoming lost in familiar places. It progresses relatively slowly, especially at a late start. It takes 3 to 20 years from the first clinical signs to death, on average 8 to 10 years [5]. Despite decades of research no drugs are available that would effectively stop the development of the disease, so it is important to develop skills that help to calm, comfort and guide a person with dementia [7].

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Schools play a vital role in providing knowledge and skill for children and youth to be able to face societal challenges and to create attentive society and inclusive communities in which all generations and diverse groups of people can live decent lives despite being ill or disabled [8]. It is a challenge for every educational system to encourage young people to become dementia aware. Researches show that in order to be successful schools need to incorporate knowledge and experience provided by young people that care for a relative with dementia [8]. Recent researches show that youngsters can become carers in very early age and can care for their relatives for years [9]. Many of these youngsters do not receive understanding and support they need to finish their schools and build their own professional careers, what points to a failure of schools to recognize and address the needs of young carers [10].

Due to a fact that the extent of a disease will continue to grow and by 2050 it is expected the number of persons with dementia in Slovenia will reach nearly 100.000 [4]. This will increase the number of young people caring for one or even more of their close relatives, what will affect their educational pathways. In order to get an insight into what young people know about dementia we conducted a survey among youngsters in secondary education. The purpose of the study was to examine how knowledge on dementia affects attitudes towards the disease and if the experiences of knowing people with dementia have an impact on attitudes. The central researches question concerns the link between knowledge on dementia, gender and the type of secondary school. We are interested in whether there are statistically significant differences between these variables in order to better integrate the content on dementia into the learning process, using the knowledge that students with experience of living with or caring for a person with dementia have.

The study was conducted in cooperation with Association Spominčica Šentjur, which is an independent branch of the organization Spominčica – Alzheimer Slovenia that was founded in 1997 by psychiatrist Kogoj, a Slovenian pioneer in treatment of dementia [11]. The Association's mission is to raise awareness and disseminate information to help relatives cope with the problems of the disease. It can also provide schools with knowledge and skills to include this important issue in the curricula.

Before presenting the results of a survey, we will contextualise the problem and present some comparative data on the inclusion of the topic of dementia in primary and secondary education.

### **The importance of education to reduce stigma**

Dementia is accompanied by stigma, as people with dementia and their relatives are still associated with the symptoms of dementia that are used as negative traits [12-15]. Stereotypes and prejudices cause isolation and social exclusion. Dementia is not recognized as a complex disease but is simplified and usually associated with its late stage, where people often no longer recognize relatives and friends and are disoriented and confused. Relatives are often in distress because they do not know how to explain the person's unusual behaviour and how to deal with it [11]. Researches show

that stigma can also transfer to carers and even to children and grandchildren of a person with dementia. Isaac, Isaac, Farina & Tabet [16] found that adolescents under the age of 16 are stigmatized by the dementia of their relatives. Their schoolmates are mocking them, what can affect their attitude towards a person with dementia in positive or negative way.

Having an experience of caring for or living with a person with dementia can strengthen attentiveness towards feelings and needs of a person and of other family members. Nikolaidou, Tsolaki, Niakas & Ladopoulou [17] reported that 50 Greek adolescents aged 14 to 21 have been found to understand and accept the symptoms of grandparents with dementia, but are concerned about the burnout of their mothers caring for them. Celdran et al. [18] found in 145 adolescents from Barcelona that the family changes when a grandparent with dementia moves in. Adolescents connect more closely with their parents and support them in caring activities. Hamill [19] found in a sample of 29 American adolescents aged 11 to 21 that 65.5% of adolescents help single grandparents with Alzheimer's disease with daily housework, food preparation, medication, and financial transactions. Care was greater if they had a loving relationship with their grandparents. It also turned out that their mothers spend an average of 12.5 hours a week caring for a relative with Alzheimer's disease, while fathers spend 2.25 hours a week. The timing of grandchildren's assistance was greater if their parents were more burdened with caring responsibilities. Grandchildren showed a negative attitude towards grandparents with Alzheimer's disease if they perceived their parents, especially fathers, as overburdened by caring for them [19].

Slovenian researches on dementia only partially focuses on young people. Researchers draw attention to the importance of gender differences in terms of socially assigned roles, which may explain the greater involvement of women in the care work of people with dementia. Šadl and Hlebec [20] found that mainly women, that is daughters, mothers and other relatives, friends and neighbours provide emotional support within the family. This suggests that women know more about dementia than men do what was confirmed in a pilot study on the knowledge of dementia among eighth-graders and secondary vocational and technical school students, where female adolescents showed better level of knowledge [21].

### **Teaching dementia in schools**

Piot [22] believes that overcoming stigma associated with dementia is the first step in combating Alzheimer's disease and dementia. Education of all generations is an effective way to create a supportive environment for people with dementia, so they can keep their dignity despite disease progression [12,15]. This is supported by the relatives of people with dementia, who claim that educating youngsters can reduce misunderstandings of the changed behaviour caused by dementia as people with dementia can give an impression that they are rude, stubborn and insist on meaningless things [23].

Isaac et al. [16] evaluated knowledge and attitudes of dementia in a cohort of 450 adolescents (aged 15-18) from schools in Sussex

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(UK). They concluded that more effort is needed to embed initial understanding of dementia in the school curriculum, which will improve awareness about dementia at an earlier age. Farina [24] reported that local dementia education initiatives exist in secondary schools across Sussex (UK) but it is unclear what the wider uptake of such programmes are. Sixty schools responded to their survey (response rate 58%). While the majority of schools expressed an interest in including some form of dementia education within their school in the future, only nine schools (15%) currently had dementia education embedded within their curriculum. Despite government calls to reduce stigma and improve attitudes towards dementia, it seems very little is being taught in secondary schools on the topic. Farina, Hughes, Griffiths, & Parveen [25] claim that adolescents are already forming negative attitudes and misconceptions of dementia, so it is important that we raise awareness about dementia in this age group. Felc et al. [21] concluded a survey in small cohort of 70 adolescents (aged 13-19) in Celje region (Slovenia). The results show that most of adolescents (e.g. 70%) thought that forgetfulness is normal part of ageing, what is a negative perception of old age and calls for a need to raise the knowledge about dementia in this age group.

Raising awareness in creating a dementia friendly generation is important because due to the aging population, it is very likely that students will be caring for relatives with dementia in a few years. Proper information about the students' knowledge about dementia is an important part of creating strategies to develop students' interest in the subject.

## Method

### Research objective

The study aimed at investigating the level of knowledge about dementia among Slovenian non-health related students. We were interested in the connection between the level of knowledge and gender, the type of secondary school, as well as the fact whether they have a relative with dementia. In order to make the comparison as objective as possible, we excluded health care secondary school students from the sample, as they are more familiar with the facts about dementia than students from other secondary schools.

### Research design

The study is based on the descriptive and causal non-experimental method. The research was conducted by the online questionnaire (1ka) which was available from 25 September 2019 to 2 December 2019. The participants were informed that the data would be used for research purposes only, and the main objective of the study was explained.

### Sample

The basic sample was represented by students of Slovenian non-health related secondary schools from twelve Slovenian statistical regions [26,27]. We invited students from lower vocational schools, secondary vocational schools, secondary technical and vocational schools, and general secondary schools and 1812 followed the link to the survey. 1223 respondents entered the survey, of which 95

respondents (5.2%) completed the survey inappropriately. The final sample consisted of 1128 respondents (62.3% of those who responded to the survey invitation) who completed the survey accordingly.

Most respondents were from general secondary schools (695 or 61.6%) and the least students from lower vocational schools (79 or 7.0%). From secondary schools with professional education there were 201 students (17.8%) and from secondary schools with vocational education 140 (12.4%) students. Only two were from South-Eastern Slovenia region and one from Coastal-Karst region. The sample included more girls (68.3%) than boys (30.9%), more students from rural areas (65.5%) than from urban areas (33.2%) and they ranged in age from 14 to 19, the average age was 16 years.

Fifty secondary schools from all twelve Slovenian statistical regions were invited to participate. We (Felc Z.) first contacted the principal of each secondary school over the phone, explained the project and obtained his/her agreement for acceptance and distribution of the links to online questionnaires. After agreement, the online questionnaires were distributed to students from the secretariat of each school. Based on the data on the region and type of secondary school we can conclude that students from at least 20 secondary schools responded. The exact number cannot be determined, as the questionnaire did not include questions on the name of the school due to anonymity.

### Instruments

The data was collected using a questionnaire that was prepared by Celdran et al. [18] and adopted it to our circumstances. The questionnaire consisted of three parts: the first part with twenty claims regarding dementia with true/false responses, the second part on experiencing changes due to dementia in relatives and the last part on basic demographic data (e.g., gender, age, residence, type of secondary school, the region in which the school is located). With the first part we were looking for the knowledge about dementia, and the second part was constructed to identify students' attitudes towards relatives with dementia. The construct validity of the instrument was confirmed by three independent experts in the field of health education, school counseling and family law.

### Data Analysis

The results were presented in the form of frequencies and percentages, in the bivariate analysis we used only nonparametric tests (Mann-Whitney U test, Kruskal Wallis test, hi-square test, Spearman rank correlation coefficient). When the assumptions for performing the hi-square test were not met, we used the Kullback 2 $\hat{I}$ -test (Likelihood ratio) instead of the hi-square statistic. In the bivariate analysis, only valid answers were considered. The total variable knowledge of dementia that occurs in the analysis was compiled by summing up the individual correct answers (20 possible answers). The correct answer was evaluated with one point, the incorrect with zero points.

## Results

The results are presented in two sets. In the first set, we determined how many basic facts about dementia students know and whether there are differences in information about dementia according to gender and the type of school they attend and those who have or do not have a relative with dementia. The second set referred to the attitude of students towards people with dementia, which is reflected in their experience of changes due to dementia in relatives.

### Knowledge of dementia

Male and female students demonstrated their knowledge of dementia by answering the first set of closed questions, which can be seen from Table 1 and Graph 1. For each correct answer, the respondent was assigned a point (if he/she chose the right answer). The maximum number of points is 20, the lowest number of points is 0, and on average students scored 14.30 points, the dispersion of data is close to between 2 and 3 (SD = 2.56), so for so many points the values deviate from this estimate on average.

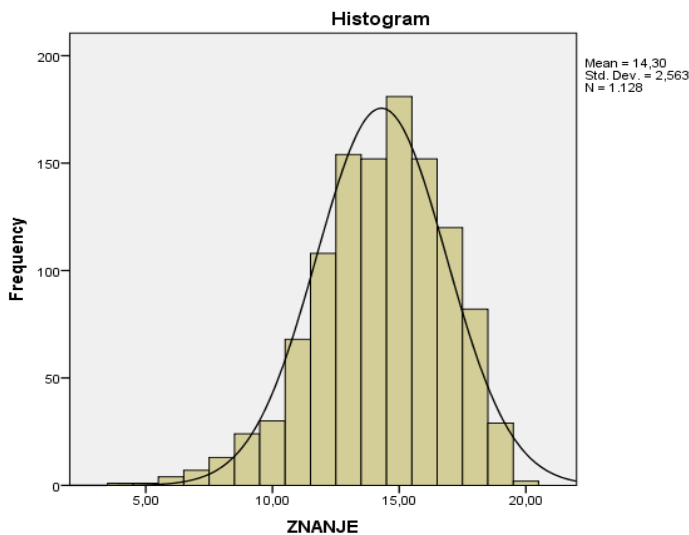
**Table 1:** Descriptive statistics for the dementia knowledge variable

	N	Min	Max	M	SD	Asymmetry coefficient	Flatness coefficient
Knowledge about dementia	1128	4	20.0	14.30	2.56	-0.502	0.261

Note. N = number of respondents; M = arithmetic mean; SD = standard deviation; Min = minimum value; Max = maximum value.

**Figure 1:** Knowledge about dementia

Note. Frequency = frequency distribution; N = number of respondents;



Mean = arithmetic mean; Std. Dev = standard deviation, ZNANJE = knowledge

Figure 1 shows that distribution of the common variable knowledge of dementia deviates from the normal distribution, so we used nonparametric tests for comparisons and correlations between the variables (Table 2) and additional comparisons of the knowledge variable with other variables (Table 3).

**Table 2:** Normality test for the dementia knowledge variable.

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Knowledge about dementia	0.109	1128	0.000	0.970	1128	0.000

a. Lilliefors Significance Correction

Note. Statistic = test statistic used in statistical hypothesis testing; Sig. = significance level p; df = degrees of freedom (number of "observations").

**Table 3:** Correlation (Spearman rho) between knowledge of dementia and age of students (N=1108)

Knowledge about dementia	Age of students	
	Spearman rho	0.148**
p value	0.00	

Note. \*\* The correlation is statistically significant at the characteristic level  $p < 0.01$ .

Additional comparisons of the variable knowledge with other variables are presented in Table 3. As shown in Table 3, age and knowledge about dementia are weakly correlated, so we can conclude that older students know more about dementia.

Table 4 shows that the higher level of knowledge about dementia was statistically significant for students with a relative with dementia (M = 14.67), girls (M = 14.63), students in secondary technical and vocational school (M = 14.73) and in general secondary schools (M = 14.64). According to the region students in the Osrednjeslovenska region, Gorenjska (M = 14.97) and Savinjska region (M = 14.58) have above-average knowledge of dementia.

A set of closed questions on knowledge (claims) regarding dementia was answered by 770 female students and 348 male students. In Table 5, we compared the responses by gender and showed the proportion of incorrect responses. Most often, respondents answered incorrectly (84.7% of all answers) that memory impairment is normal with age. 64.1% of respondents did not know that dementia manifests itself as a loss of planning and almost half (49.6%) did not know that it manifests itself as a loss of mental abilities. Compared to female students, male students showed poorer knowledge of the fact that dementia manifests itself as loss of memory, environmental orientation, speech, recognition, changes in behaviour, that the number of people with dementia increases after age 65 and that the most common form of dementia is Alzheimer's disease ( $p < 0.05$ ). The responses of female and male students also differed in reducing the risk of dementia. Male students achieved statistically significantly lower results in this area, as they repeatedly erroneously stated that alcohol consumption and smoking, as well as the use of computer games and social networks, reduced the risk of dementia ( $p < 0.05$ ).

It can be summarised from Table 6 that the largest share of incorrect answers was among students in lower vocational schools and secondary technical and vocational schools ( $p < 0.05$ ) compared to others.

**Table 4:** Comparison of differences in knowledge about dementia by different demographic variables.

Demographic variables		N	M	SD	MW U / KW	p value
Relative with dementia*	YES	335	14.67	2.44	116482.500	0.002
	NO	789	14.14	2.60		
Gender*	Female	770	14.63	2.36	106979.000	0.000
	Male	348	13.63	2.82		
Residence	City	375	14.17	2.49	129917.000	0.086
	Countryside	739	14.40	2.58		
Type of school in*	LVS	201	13.53	2.69	43.627	0.000
	SVS	140	13.63	2.33		
	STVS	79	14.73	2.63		
	GSS	695	14.64	2.46		
Region where schooling is*	Eastern and northern SLO (Pomurje, Podravje, Koroška)	145	14.30	2.41	55.832	0.000
	Savinjska	464	14.58	2.42		
	Jugovzhodna SLO, Zasavje in Posavje	90	13.37	2.88		
	Central SLO, Gorenjska	234	14.97	2.44		
	Goriška, Primorska, Obalno kraška	177	13.30	2.56		

Note. \*  $p < 0.05$  = degree of comparison the difference between groups being statistically significant; N = number of respondents; M = arithmetic mean; SD = standard deviation; MW U / KW = Mann-Whitney test / Kruskal Wallis test; SLO = Slovenia; LVS = Lower vocational school; SVS = Secondary vocational school; STVS = Secondary technical and vocational school; GSS = General secondary school.

**Table 5:** Comparison of the incorrect answers in knowledge of dementia according to the gender of the respondents.

Claims regarding dementia	Females (N=770)	Men (N=348)	Total (N=1128)	p value
It is disease of brain.	2.3%	2.9%	2.6%	0.595
It appears as memory loss*.	0.1%	1.4%	1.1%	0.020
It manifests as a loss of orientation*.	41.9%	54.0%	46.2%	0.000
It manifests as hearing loss.	4.2%	5.5%	4.6%	0.333
It appears as a loss of speech*.	74.8%	81.3%	77.0%	0.017
It appears as a loss of planning.	63.4%	64.7%	64.1%	0.680
It appears as a loss of mental ability.	48.1%	51.7%	49.6%	0.255
It appears as a loss of recognition*.	23.9%	39.4%	29.4%	0.000
It appears as an inappropriate behaviour*.	55.8%	62.4%	58.1%	0.041
It is increasing after the age of 65*.	2.3%	8.0%	4.1%	0.000
With age, memory impairment is normal.	86.0%	81.9%	84.7%	0.079
It is contagious.	1.4%	2.9%	1.9%	0.099
Alzheimer's disease is most common cause of dementia*.	26.0%	38.2%	29.9%	0.000
Person with dementia can live at home.	21.0%	23.3%	21.7%	0.401
Dementia risk is reduced through physical activity.	15.1%	14.9%	15.1%	0.958
Dementia risk is reduced by alcohol drinking*.	2.6%	7.8%	4.0%	0.000
An appropriate body weight reduces dementia risk.	30.6%	31.6%	30.9%	0.748
Smoking reduces the risk of dementia*.	3.4%	6.6%	4.1%	0.014
Dementia risk is reduced by eating healthy food.	11.6%	13.2%	12.1%	0.430
The risk of dementia is reduced by reducing the use of computer games and social networks.*	23.2%	45.4%	30.1%	0.000

Note. \* The difference between the groups is statistically significant at the characteristic level  $p < 0.05$ ; N = number of respondents.

### Attitude towards people with dementia

In the second part, we presented responses of 335 students' experiences of the changes in behaviour and personality of a relative with dementia and have experiences in relation to them. They answered an open-ended question about experiencing change in a person with dementia. We obtained narrative answers from the respondents that can be summarised into twelve categories, presented in Table 7. Some of the respondents gave answers

that fall into several categories, so a larger number of answers is possible for one respondent.

To compare narrative results with other responses, we analyzed the frequency distributions by individual categories and found that they differ significantly in terms of positive (reduces stigma due to dementia) or negative attitude (increases stigma due to dementia) to symptoms in a relative with dementia. Table 7 shows

**Table 6:** Comparison of the incorrect answers in knowledge of dementia according to the type of secondary school.

Claims regarding dementia	LVS(N=201)	SVS(N=140)	STVS(N=79)	GSS (N=695)	Total(N=1128)	p value
It is a disease of the brain.	3.0%	2.1%	0.0%	2.9%	2.6%	0.203
It appears as memory loss.	1.0%	0.7%	0.0%	0.4%	1.1 %	0.635
It manifests as a loss of orientation*.	54.7%	54.3%	39.2%	41.7%	46.2%	0.001
It manifests as hearing loss.	6.0%	3.6%	8.9%	3.9%	4.6%	0.203
It appears as loss of speech..	75.1%	85.0%	73.4%	76.0%	77.0%	0.095
It appears as loss of planning*.	71.6%	73.6%	46.8%	61.3%	64.1%	0.000
It appears as a loss of mental ability*.	60.7%	67.1%	36.7%	45.8%	49.6%	0.000
It appears as a loss of recognition*.	38.8%	40.7%	27.8%	23.5%	29.4%	0.000
It appears as an inappropriate behavior.	58.2%	65.7%	55.7%	56.7%	58.1%	0.252
It is increasing after the age of 65*.	9.5%	5.7%	2.5%	2.3%	4.1%	0.000
With age memory impairment is normal.	83.1%	79.3%	79.7%	86.9%	84.7%	0.053
It is contagious.	3.0%	2.1%	1.3%	1.6%	1.9%	0.634
Alzheimer's disease is most common form of dementia.	30.3%	37.9%	32.9%	27.3%	29.9%	0.080
Person with dementia can live at home*.	33.3%	19.3%	15.2%	19.9%	21.7%	0.000
Dementia risk is reduced through regular physical activity.	15.9%	17.1%	16.5%	14.1%	15.1%	0.750
Dementia risk is reducing by drinking acohol.	6.0%	3.6%	7.6%	3.2%	4.0%	0.150
An appropriate body weight reduces dementia risk*.	40.3%	37.9%	25.3%	27.9%	30.9%	0.001
Smoking reduces the risk of dementia*.	10.0%	3.6%	7.6%	2.4%	4.1%	0.000
Dementia risk is reduced by eating healthy food.	13.9%	14.3%	13.9%	10.9%	12.1%	0.495
The risk of dementia is reduced by reducing the use of computer games and social network.	33.8%	33.6%	38.0%	27.8%	30.1%	0.102

Note. \*The difference between the groups is statistically significant at the characteristic level  $p < 0.05$ ; N = number of respondents. LVS = Lower vocational school; SVS = Secondary vocational school; STVS = Secondary technical and vocational school; GSS = General secondary school.

**Table 7:** Students' experiences of the changes in behaviour and personality of a relative with dementia.

Experiencing changes in relatives with dementia	Total (N=335)	
	f	f %
It was hard and painful until we were educated about dementia and accept it.	42	12.5%
People with dementia need understanding, patience and help.	38	11.3%
It is awful because they don't remember past events.	50	14.9%
It is sad because they don't recognize their loved ones and mistake them for the deceased.	73	21.7%
It is difficult because they repeat the same thing over and over again.	30	8.9%
They live in their own world of illusions, and accusing you of injustice.	12	3.6%
It is painful because your grandparents don't recognize you anymore.	10	3.0%
Fear that your closest relatives with dementia will no longer recognize you.	5	1.5%
It has no effect on me.	54	16.1%
I don't know.	2	0.6%
Without answer.	56	16.7%

Note: f = frequency distribution; f % = percentage of frequency distribution. N = number of respondents with relative with dementia.

that a sadness and fear prevail in their attitudes towards dementia in half of the respondents with a relative with dementia (55% of all responses). Only a tenth (11.3% of responses) expressed an optimistic attitude towards people with dementia, believing that they need understanding, patience and help to be able to carry out activities in which they could still participate. A positive attitude was also present in an additional tenth of respondents (12.5% of responses), who believe that experiencing changes in a relative due to dementia is easier and less painful when they are educated about dementia and accept it.

## Discussion

Results show that knowledge of the basic facts about dementia among Slovenian students, compared to peers from other countries, is rather good [16,28]. Female students showed a better level of knowledge ( $p < 0.05$ ). The finding is consistent with a study in 496

Scottish students aged 15 and 16 [28]. In this study, girls showed a higher level of knowledge of dementia compared to male students ( $p < 0.01$ ). The finding that female students have better knowledge of dementia is also consistent with other research, which showed that care work in the family is still predominantly performed by women [19,29] what affects their knowledge about illnesses and conditions of persons receiving care.

We found that a lack of awareness is present in certain areas of knowledge of lifestyle-dependent risk factors for dementia. The latest guidelines from the World Health Organization state that we can reduce the risk of developing dementia by regular physical activity, avoiding smoking and drinking harmful amounts of alcohol, maintaining a healthy weight, eating a balanced healthy diet and maintaining normal blood pressure, cholesterol and blood sugar [30]. We found that the majority of male and female

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students (77.8%) are aware of measures to reduce the risk of dementia, which is probably related to the fact that many schools are members of the Slovenian Network of Healthy Schools, which implement promotion programs as part of the educational process. Health in the physical, mental, social and environmental health fields is taught for students, teachers and parents [31]. When compared by type of school, there were differences in knowledge of risk factors for dementia. To reduce it, smoking was erroneously stated by a tenth of lower vocational school students, which led to differences between them and students of all other secondary schools ( $p < 0.05$ ).

It is worrying to note that as many as 84.7% of all surveyed male and female students believe that memory impairment with age is normal. Admittedly, a common problem in old age is poor memory, which does not hinder an individual's daily life. Brezovar [32] emphasizes that it is necessary to separate healthy aging from dementia. In recent years, when we understand the background of dementia better, we know how to distinguish healthy aging from disease aging [5,32]. Only when independent functioning in everyday activities is significantly hindered and the problems worsen, we talk about dementia [32]. Therefore, if we accept forgetfulness, which is escalating, as something that is normal in old age, then we will deny the elderly timely treatment and therefore, of course, the necessary treatment [5].

Differences in knowledge of dementia between groups of surveyed male and female students proved to be significant in terms of personal experience with a relative with dementia. Students who had contact with relatives with dementia showed better knowledge of dementia ( $p < 0.05$ ), but a minority expressed an optimistic and positive attitude towards people with dementia. Only a tenth expressed the belief that people with dementia need understanding, patience and help to be able to carry out activities in which they could still participate, and an additional 12.5% felt that experiencing changes in a relative due to dementia was easier and less painful when get educated about dementia and accept it. However, the majority of male and female students who have a relative with dementia (55%) expressed fear and unease towards people with dementia, which can increase the stigma due to dementia. Most likely, the negative attitude is a combination of a lack of knowledge about the course of dementia and a lack of support for young people. This can lead to misunderstandings of the needs of people with dementia and is focusing on losses due to the disease, all deepening the stigma of dementia [28,33].

Schools play important role in addressing societal issues and influence lifeworld of children and youth as well as their families. Our research pointed to two important issues that should be addressed in the future. One relates to general knowledge and awareness of dementia related topics and the other relates to the needs of youngsters, which are in contact with or even care for a person with dementia. The first one is already addressed and a broad body of support material for teachers in different countries in Europe is available. We can find webinars, training tools, videos and other material provided mainly by different

associations (see Alzheimer Europe, Dementia UK, Alzheimer society, etc.) and (inter)national health organisations, like World Health Organisation (WHO), UK National Health System (NHS) and many others. Alzheimer society runs a project on Create a dementia friends and offers Teacher's toolkits and Assembly presentations for secondary schools, available online [34]. Universities are also offering training material and courses on how to teach dementia [10,35]. From the number of teaching material available we can conclude that there is a good alliance of educational institutions, universities, public institutions and non-governmental organisations working together to raise knowledge and awareness of dementia related issues. Such an alliance can be created also in Slovenia as it has well organised and developed public and civil society sector.

The second important outcome of our research relates to youngsters that have a relative with dementia. This issue is a complex and not at all easy to address. As the research show that young people can observe the process of care or can take over some caring responsibilities. In either case, they are affected by the symptoms and the development of the dementia in their relative what can cause deep feelings for the person with dementia and for caring relative, most often mothers. Experiencing the progress of the disease and also problems and burdens of care can cause conflicting and very hard feelings for young person, what can affect the educational opportunities of youngster [36]. Razpotnik, Turnšek, Rapuš Pavel & Poljšak Škraban [37] claim that the needs of children and their families should not be overlooked or subordinated to the needs of institutions, in our case schools what is an important principle of modern pedagogy. Some of the research [10] point to the negative experiences young carers have in schools because their needs are not met or they are even misinterpreted as misbehaviour. Schools should recognise the problem and offer educational and supportive programmes that would help young people to better understand the problem and to better balance school and caring responsibilities. Here an inclusion of their parents is crucial as they also have to understand child's feelings and his/her need for schooling that should come first. Here also an inclusive and open education is needed that is capable of incorporating experiences of caring families, young people, civil society organisations and public institutions. Young people can be excellent narrators of their own experiences of care. Peer education can also enable youngsters that do not speak about their home situations to open up and overcome fear of possible stigma.

We have also received emails from school counselling services with information that some of the themes in relation to dementia are included into learning process but this is not taught systematically and depends on the awareness of individual teachers about the disease. Taking into consideration the fact of ageing society we can assume that in few decades the number of youngsters living with a relative with dementia will triple [2,4], what stresses the important role schools play in creating dementia aware generations.

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## Conclusion

The research showed that the knowledge of dementia among Slovenian non-health related secondary school students is solid, but it differs between the sexes and secondary vocational and technical secondary school students compared to grammar school students. Dementia and the reduction of risk for it are least known to boys and students of secondary vocational and technical vocational schools. Learning that comprehensively covers the facts about the risk of dementia could further encourage adolescents to take care of their health and guide them to think about the quality of their lives in old age.

The first step we should take is to educate adolescents about the actual symptoms and causes of dementia and the false beliefs that exist about it. It is worrying to find that students are convinced that escalating forgetfulness is a completely normal companion of age. Because of such a misconception among people, we will deny the elderly timely treatment and treatment. Therefore, it is extremely important to teach students the importance of early diagnosis of dementia, which allows the individual and his relatives to prepare in time for the course of the disease and cope with its symptoms.

The key finding of the research is that students who have a relative with dementia are better acquainted with the disease, but most of them show a negative attitude towards people with dementia. Teachers ensure the quality of knowledge transfer at the appropriate level, as they know students, and at the same time they can encourage the active involvement of students with relatives with dementia in education. This paper could also be informative for the teachers who think that such an approach could provide greater motivation to acquire knowledge about dementia in all students and pave the way for their contribution to reducing stigma in people with dementia.

We also recognised certain shortcomings of the research. The first shortcoming would be a sample that could include a larger number of participants from all Slovenian regions and would be more representative in certain areas (e.g., experiencing changes due to dementia in a relative). An additional shortcoming is that in the questionnaire all items in the dimension of knowledge of dementia are only positively or negatively evaluated. In the future, it would be useful to explore the components of knowledge and attitudes towards people with dementia also among secondary school students with a health program. Additional information is also needed in relation to alcohol consumption and smoking as prevention factors for the development of dementia. As already stated, these results are worrying as they can strengthen unhealthy life-style, therefore additional clarifications are needed to develop strategies and programs to tackle such opinion.

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