

A 12-YEAR TREND OF PSYCHOLOGICAL DISTRESS: NATIONAL STUDY OF FINNISH UNIVERSITY STUDENTS

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SUMMARY

Objective: The study aimed to explore changes in the prevalence of psychological distress and co-occurring psychological symptoms among 19–34 years old Finnish university students between the years 2000 and 2012.

Methods: The prevalence of perceived frequent psychological symptoms was compared in four nationwide cross-sectional student health surveys with random samples (N = 11,502) in the following years: 2000 (N = 3,174), 2004 (N = 3,153), 2008 (N = 2,750), and 2012 (N = 2,425).

Results: In the time phase from 2000 to 2012, the overall psychological distress (12-item General Health Questionnaire, GHQ-12) increased from 22% to 28%, while there was also an increase in the frequently experienced psychological symptoms (depressiveness from 13% to 15%, anxiety from 8% to 13%, concentration problems from 12% to 18%, and psychological tension from 13% to 18% with a peak prevalence observed in 2008). The co-occurrence of different psychological symptoms increased as well. Psychological distress was more common in females and in older students.

Conclusions: The findings suggest an increasing trend of frequent psychological distress among Finnish university students over the years from 2000 to 2012, with the peak prevalence occurring in 2008, which may reflect the growing multifaceted environmental demands.

Key words: Finland, university students, well-being, psychological distress, GHQ-12

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INTRODUCTION

Psychological disorders have been regarded as an increasing problem among university students in many countries (1–5). The prevalence of psychological distress among Canadian undergraduate students was reported to be 30% (females 35%, males 24%) (6). In Australia, 19% of university students reported serious psychological distress (7), while in Iceland, 21% of female university students reported anxiety and 23% depression symptoms (8). In various studies the prevalence of psychological distress among first-year students ranged from 21% (23% females, 16% males) in Norway (9) to 26% (33% female, 16% males) in France (5) and up to 34% in Canada (6). Correspondingly, 26% of Canadian fourth year students have reported psychological distress (6). Most of the previous studies show a higher prevalence of perceived psychological distress among students than among working population (2, 6, 7), with some exceptions (8).

Different stress factors are thought to increase the risk of anxiety, depression, and even the symptoms of personality disorders among university students (2, 10, 11). There are many potential stress factors associated with high study demands during university studies, such as pressure to succeed, feelings of inadequacy, coping without peer support, competition with peers, financial

problems, and insecurity about the future (10, 12). Over the past decade, the western world has faced multiple technological, societal and socioeconomic changes, including economic uncertainty and unemployment (13). These changes are also reflected in the university environment, creating more stress than before, even if the core of the university system and studies has remained the same (14). The threat of future unemployment and short-term jobs, with financial uncertainty may lead to increasing competition and pressure to exceed oneself, which, in turn, may result in feelings of inadequacy and psychological distress. The excessive demands of life in general and the increasingly busy lifestyle with a greater focus on individual achievements may be a major factor contributing to daily exhaustion (14).

Despite growing concern about the psychological distress in young adults, previous studies only report cross-sectional data on the prevalence of psychological symptoms in university students without revealing possible changes in the prevalence over the years.

Conducted every four years, starting from 2000, and using repeatedly the same measures and data collection methods, the nationwide Finnish Student Health Survey provides an opportunity to identify health-related trends among university students. The aim of the present study was to investigate possible changes

in psychological distress among Finnish undergraduate university students from the year 2000 to 2012. Our hypothesis was that there would be an increasing trend in the prevalence rates over the study period.

MATERIALS AND METHODS

Study Population

The data were derived from a nationwide health surveys conducted among Finnish university students (Student Health Survey). In each survey, the study population comprised all Finnish undergraduate students under 35 years of age. The present study uses data from self-administered questionnaire surveys in 2000, 2004, 2008 and 2012 (Table 1). The health surveys were conducted among university students who were entitled to receive healthcare services provided by the Finnish Student Health Service. In Finland, all undergraduate students studying at academic universities are entitled to these services. The final target group consisted of 19–34 years old students who lived in Finland and provided their home addresses. The study population was systematically sampled from the student register of the Finnish Student Health Service. In 2000, a random sample was developed with systematic equally spaced sampling and in the other study years with stratified sampling by study localities. The respondents represented the whole study population for the demographic background variables, except for the gender (females were overrepresented at 60–75%). For the surveys (2000/population N=128,600; 2004/population N=145,633; 2008/population N=152,196; 2012/population N=130,781), self-administered, comparable questionnaires were mailed to a random sample of undergraduate students (15).

Survey

The timing of surveys in the spring (February – March), sampling models, and data collection methods were similar throughout

the study period. The study material was gathered by means of a postal or electronic questionnaire with 3–5 reminders (postal and electronic) after the initial round. The self-administered health survey covered a comprehensive range of items concerning students' physical, mental and social health, health behaviours, social relationships, health-related attitudes, and the use of health care services.

The 12-item General Health Questionnaire (GHQ-12) was used to obtain an index (0–12) of the respondents' subjective rating of their overall psychological distress within the past few weeks (16). The GHQ-12 is a validated tool to measure non-specific psychiatric morbidity with 12 items, such as satisfaction with oneself and with one's life situation. The measure includes questions regarding, for example, concentration, decision making, coping with difficulties, feelings of usefulness, happiness, self-confidence, and sleep disturbances. Respondents were asked to rate the extent to which they had recently experienced any of the 12 symptoms, using a 4-point Likert scale (1 = not at all, 2 = same as usual, 3 = somewhat more than usual, and 4 = much more than usual). In our study, the original scoring method was used. In this method, response categories 1 and 2 are scored as 0 (no problem), and 3 and 4 are scored as 1 (problem), thus the total score ranges from 0–12. The GHQ-12 allows for the definition of a cut-off point for clinically significant pathology. Both in the studies validating the GHQ-12 (17) and in prior studies in Finnish study populations (18, 19), a total score of four or higher on the scale 0–12 has been considered as an indication of psychological distress. Reliability, assessed by Cronbach's alpha was 0.89 for the present sample. In a previous Finnish study, sensitivity and specificity with the cut-off point of 4 was 77% and 84%, respectively (18). In other validity studies, sensitivity and specificity have varied from 75% to 89% and from 71% to 89%, respectively (17).

In addition, the health survey questionnaire included a 26-item set of questions related to general physical and psychological health symptoms. This general health measure has been tested in students without any serious health problems (20, 21). The respondents were asked to indicate the frequency of each specific symptom

Table 1. Respondents and response rates (%) by gender and age

Gender	Age groups (years)	Survey year				Total
		2000	2004	2008	2012	
Both genders	All (19–34)	3,174/5,030 (63)	3,153/5,030 (63)	2,750/4,983 (55)	2,425/4,996 (49)	11,502/20,039 (57)
Female	19–24	1,020/1,366 (75)	1,162/1,547 (75)	980/1,449 (68)	834/1,387 (60)	3,996/5,749 (70)
	25–34	930/1,343 (69)	859/1,183 (73)	770/1,312 (58)	674/1,265 (53)	3,283/5,103 (64)
	All (19–34)	1,950/2,709 (72)	2,021/2,730 (74)	1,750/2,761 (63)	1,508/2,652 (57)	7,229/10,852 (67)
Male	19–24	613/1,060 (58)	599/1,219 (49)	444/931 (47)	430/1,099 (39)	2,086/4,309 (48)
	25–34	611/1,261 (49)	533/1,081 (49)	556/1,291 (43)	487/1,245 (39)	2,187/4,878 (45)
	All (19–34)	1,224/2,321 (53)	1,132/2,300 (49)	1,000/2,222 (45)	917/2,344 (39)	4,273/9,187 (47)
Age (years) – Mean (SD)		24.9 (3.3)	24.5 (3.5)	24.8 (3.6)	24.9 (3.7)	

during the past month using the alternatives 0 = never, 1 = occasionally, 2 = weekly, and 3 = daily or almost daily. In the analysis, the response alternatives 2 and 3 were merged into a “frequent” category, and 0 and 1 into a “no symptoms” category (control). The subscales analysed for “frequent psychological symptoms” vs. “no symptoms” were the following: depressiveness, anxiety, psychological tension, and concentration problems (22–25).

Statistical Analysis

Descriptive statistics are presented as frequencies and percentages. The association between different psychological symptoms (GHQ-12 and frequent depressiveness, anxiety, psychological tension, and concentration problems) and gender, age (≥ 25 years vs. < 25 years) and survey year were examined by log-binomial regression (PROC GENMOD, using log link and binomial distribution). The starting model was gender, age, class, survey year, and all the interactions between these categorical factors. Non-significant interactions (p-value limit 0.10) were removed from the model one by one. From the final model, relative risks (RR) and 95% confidence intervals (CI) were calculated comparing females to males, the older age group to the younger one, and also the years 2004, 2008, and 2012 separately to the year 2000. The sum of different psychological symptoms ($N = 0-4$: depressiveness, anxiety, psychological tension, concentration problems) was calculated and analysed with a proportional-odds cumulative logit model. In addition, odds ratios (OR) and their 95% confidence intervals were calculated. Those with missing values in at

least one psychological symptom response were not included in the cumulative logit model. Two-tailed p-values under 0.05 were considered to be statistically significant. All the analyses were conducted using SAS software version 9.3 for Windows (SAS Institute Inc., Cary, NC, USA).

Ethics

The study design and the informed consent procedures were approved by the Medical Ethics Committee of the Hospital District of Southwest Finland.

RESULTS

At the time of the surveys, the overall number of university undergraduate students in Finland varied from 128,600 to 152,196. The response rates of the randomly sampled populations varied from 49% to 63% without any significant differences in the demographic variables between the participants and drop outs (Table 1).

Psychological symptoms were more common in females than males. The prevalence of these symptoms was also higher in older students when compared to the younger ones (Table 2). There was a statistically significant increasing trend noted over the study period in all of the measured mental health symptoms (Table 3). The prevalence of overall psychological distress measured by GHQ-12 increased from 22% in 2000 to 28% in 2012. Overall,

Table 2. Prevalence of overall psychological distress (GHQ-12) and frequent psychological symptoms (% , N) in the survey years 2000–2012

	2000 % (N)	2004 % (N)	2008 % (N)	2012 % (N)
Psychological distress (GHQ-12)				
Female	27.3 (532)	30.1 (608)	30.1 (527)	32.2 (485)
Male	14.7 (180)	19.3 (219)	19.3 (193)	20.6 (189)
Both genders	22.4 (712)	26.2 (827)	26.2 (720)	27.8 (674)
Depressiveness				
Female	15.5 (302)	18.8 (379)	18.0 (315)	16.9 (255)
Male	8.6 (105)	10.2 (115)	12.3 (123)	10.9 (100)
Both genders	12.8 (407)	15.7 (494)	15.9 (438)	14.6 (355)
Anxiety				
Female	10.2 (199)	13.8 (279)	16.8 (294)	15.1 (228)
Male	5.1 (62)	8.2 (93)	8.9 (89)	8.2 (75)
Both genders	8.2 (261)	11.8 (372)	13.9 (383)	12.5 (303)
Concentration problems				
Female	13.7 (268)	18.6 (376)	21.0 (368)	21.1 (318)
Male	10.4 (127)	14.7 (166)	16.8 (168)	11.8 (108)
Both genders	12.4 (395)	17.2 (542)	19.5 (536)	17.6 (426)
Psychological tension				
Female	15.3 (299)	21.4 (433)	22.1 (387)	21.7 (327)
Male	8.7 (107)	13.6 (154)	13.5 (135)	11.5 (105)
Both genders	12.8 (406)	18.6 (587)	18.9 (522)	17.8 (432)

GHQ-12 – the 12-item General Health Questionnaire

Table 3. Relative risk ratios (RR) for overall psychological distress (GHQ-12) and frequent psychological symptoms

	Overall psycho- logical distress (GHQ-12) RR (95% CI)	p-value	Depressiveness RR (95% CI)	p-value	Anxiety RR (95% CI)	p-value	Concentration problems RR (95% CI)	p-value	Psychological tension RR (95% CI)	p-value
Gender										
Female vs. male	1.6 (1.5–1.7)	<0.0001	1.7 (1.5–1.8)	<0.0001	1.8 (1.6–2.1)	<0.0001	1.4 (1.3–1.5)	<0.0001	1.7 (1.6–1.9)	<0.0001
Age										
≥25 vs. <25 years	1.1 (1.1–1.2)	<0.0001	1.1 (1.0–1.2)	0.0704	1.1 (1.0–1.2)	0.1019	1.1 (1.0–1.2)	0.0026	1.2 (1.1–1.3)	0.0004
Survey year										
2004 vs. 2000	1.2 (1.1–1.3)	0.0014	1.2 (1.1–1.4)	0.0033	1.4 (1.2–1.6)	<0.0001	1.4 (1.2–1.6)	<0.0001	1.4 (1.3–1.6)	<0.0001
2008 vs. 2000	1.2 (1.1–1.3)	0.0016	1.2 (1.1–1.4)	0.0023	1.7 (1.4–1.9)	<0.0001	1.6 (1.4–1.8)	<0.0001	1.5 (1.3–1.6)	<0.0001
2012 vs. 2000	1.2 (1.1–1.3)	<0.0001	1.1 (1.0–1.3)	0.0542	1.5 (1.3–1.8)	<0.0001	1.3 (1.1–1.5)	0.0001	1.4 (1.2–1.6)	<0.0001

GHQ-12 – 12-item General Health Questionnaire

Table 4. Prevalence of students with no, one or multiple perceived frequent symptoms (%; N)

	No psychological symptoms % (N)	At least one symptom % (N)	2 to 4 symptoms % (N)	1 symptom % (N)	2 symptoms % (N)	3 symptoms % (N)	4 symptoms % (N)
Gender							
Female	69.1 (4,923)	30.9 (2,202)	19.8 (1,411)	11.1 (791)	7.5 (536)	5.3 (379)	7.0 (496)
Male	79.2 (3,327)	20.9 (876)	11.9 (496)	9.0 (380)	5.0 (209)	3.0 (124)	3.9 (163)
Both genders	72.8 (8,250)	27.1 (3,078)	16.8 (1,907)	10.3 (1,171)	6.6 (745)	4.4 (503)	5.8 (659)
Age							
≥25 years	72.5 (3,855)	27.5 (1,465)	17.6 (939)	9.9 (526)	6.5 (348)	4.6 (246)	6.5 (345)
<25 years	73.2 (4,395)	26.8 (1,613)	16.1 (968)	10.7 (645)	6.6 (397)	4.3 (257)	5.2 (314)
Survey year							
2000	77.3 (2,404)	22.7 (705)	13.1 (408)	9.6 (297)	5.6 (175)	3.9 (122)	3.6 (111)
2004	71.8 (2,248)	28.2 (882)	17.3 (542)	10.9 (340)	6.1 (191)	4.5 (142)	6.7 (209)
2008	68.9 (1,873)	31.2 (845)	19.7 (532)	11.5 (313)	8.1 (219)	5.0 (135)	6.6 (178)
2012	72.8 (1,725)	27.3 (646)	18.0 (425)	9.3 (221)	6.8 (160)	4.4 (104)	6.8 (161)
Total	72.8 (8,250)	27.4 (3,078)	17.0 (1,907)	10.3 (1,171)	6.6 (745)	4.4 (503)	5.8 (659)

30% of females and 18% of males reported psychological distress ($p < 0.0001$). The difference in the prevalence between the older (27%) and younger students (24%) was also statistically significant ($p < 0.0001$).

Correspondingly, the prevalence of depressiveness increased from 13% in 2000 to 15% in 2012 ($p = 0.009$). Depressiveness was reported by 17% of females and 11% of males ($p < 0.0001$) without any significant differences between older and younger students.

The prevalence rate of anxiety increased from 8% in 2000 to 13% in 2012 ($p < 0.0001$) with female predominance (14% vs. 8%, $p < 0.0001$), and without any difference between younger and older students. The increase in the prevalence of anxiety was significant from 2000 to 2008, but not from 2004 or 2008 to 2012.

The prevalence of concentration problems increased from 12% to 18% ($p < 0.0001$), being 19% in women and 13% in men ($p < 0.0001$), and 18% in older students versus 16% in younger students ($p = 0.003$). The prevalence rate increased significantly from 2000 to 2008 ($p < 0.05$) but decreased from the peak prevalence in the years from 2008 to 2012 ($p = 0.01$). As regards concentration problems, the interaction effect between gender and survey year was significant ($p = 0.033$). In women, the prevalence increased over the years (14%, 19%, 21%, 21%), whereas in men, the peak prevalence was achieved in the year 2008 (10%, 15%, 17%, 12%). Thus, the total occurrence of concentration problems in 2012 was lower than in 2008 ($p = 0.014$).

The prevalence rate of psychological tension increased from 13% to 18% ($p < 0.0001$) with female predominance (20% vs. 12%, $p < 0.0001$). Tension was also more common in older students (18% vs. 16% in younger students, $p = 0.0004$).

The co-occurrence of depressive symptoms, anxiety, concentration problems, and psychological tension (all 4 psychological symptoms) was more common in females than in males (OR 1.7, 95% CI 1.6–1.9, $p < 0.0001$) (Table 4). There was also a small predominance of older students in the co-occurrence of the four symptoms (OR 1.1, 95% CI 1.0–1.2, $p < 0.05$). The number of students with 1–4 symptoms increased from the year 2000 to 2008 (from 23% to 31%) and then decreased to 27% in 2012 (2008 vs. 2012, $p = 0.011$) (Table 4). A significant increase of the co-occurrence of psychological symptoms was found for every survey year when compared to the year 2000, with ORs 1.4 (95% CI 1.2–1.5), 1.5 (95% CI 1.4–1.7), and 1.3 (95% CI 1.2–1.5) in 2004, 2008 and 2012, respectively. In the base line year 2000, 13% of students reported co-occurring symptoms (2–4 symptoms), and the prevalence rate increased to 17%, 20%, and 18% in the subsequent surveys.

DISCUSSION

In this nationwide trend study of Finnish undergraduate university students, the prevalence of perceived psychological distress increased from the year 2000 to 2012. The increase was statistically significant, but contrary to our hypothesis, the increase did not continue consistently throughout the study period. The prevalence of measured psychological symptoms peaked in 2008, with every third student reporting some type of psychological symptoms. The proportion of students with multiple co-occurring mental health symptoms increased over the study years to 18% with a peak prevalence of 20% in 2008. When the prevalence

rates of the different psychological symptoms were compared, overall psychological distress as assessed by GHQ-12 was the most common. In the final survey year, perceived concentration problems and psychological tension were more common than depressive and anxiety symptoms.

Even if our study population is nationally representative, and a proper randomisation was done to diminish possible bias relating to a convenience sample, the response rates unfortunately remained at moderate level. Despite our efforts to motivate respondents with two electronic reminders, the response rates decreased over the years, especially among men, which may have affected the results and biased our findings. One reason for the low response rates might be the extent of our questionnaire (a total of 168 questions about physical, mental and social health, health-related behaviour, and so on.). For each survey, the data collection took place in the spring term. The respondents seemed to represent the whole student population in Finland for various demographic background variables with the exception of gender. As in many previous studies, women were overrepresented in these surveys. Even if this study reflected trends in the psychological distress of the whole student population, we do not know if there are significant differences between faculties.

Since we are not able to clarify all possible differences between respondents and non-respondents, it is possible that the perceived general health of the respondents was, in fact, either poorer or better in comparison to non-respondents. However, in 2008, shortly after mailing out the original questionnaire, a non-response analysis was performed by means of a telephone interview among a random sample of non-respondent male students (24). In this analysis, non-respondents represented well full-time university students without any cumulative health problems and without significant differences for mental health problems. On the other hand, the perceived general health of the respondents was somewhat poorer than that of the non-respondents. In addition, the respondents had more perceived difficulties in sleep, concentration and loneliness than the non-respondents. Daily smoking was more common in the non-respondents, whereas the respondents were more often involved in leisure activities such as sport (24). Declining response rates during recent decades seems to be a world-wide problem especially in men (26, 27). In this study, the comparability of the surveys in different years is ensured by the fact that the methods of measuring psychological distress, the timing of the survey and the sampling procedures were similar from one survey to another and the surveys were conducted in the same universities.

Our findings are based on self-reported symptoms that are not explained by improved identification of these symptoms in health care services or by increased willingness to seek psychological treatment. The measurement instruments used in the surveys thus only measure respondents' own perception of psychological symptoms, which are not necessarily confirmed by a physician or other healthcare professional.

To our knowledge, this is the first study of long-term trends of psychological distress among university students. When compared to cross-sectional studies among university students, the prevalence rates (22–28%) and female predominance of perceived psychological distress (GHQ-12) in the analysed surveys are in line with previous studies (2, 5–9). Similarly, the prevalence of depression (13–15%) and anxiety symptoms (8–13%), also with

a female predominance, are in line with previous cross-sectional studies (7, 28, 29).

Prevalence rates of psychological symptoms reported in different studies are not directly comparable due to the differences in cultures, study designs, target samples, methodology, and study years. In some studies, only the frequency of symptoms has been reported, while others concentrate on the perceived severity of symptoms. We aimed at evaluating the severity of symptoms by using the GHQ-12, with a separate evaluation of the frequency of each symptom. The prevalence of frequent symptoms during the past month was chosen to describe the actual situation better than e.g. life-time prevalence of occasional symptoms.

Our study design did not allow for the evaluation of the exact impact of psychological distress on everyday life. However, it is known that high levels of psychological distress may contribute to a number of negative outcomes: reduced academic performance, school dropout, risk of psychiatric disorders, substance abuse, decreased physical health, and poor self-care including lacking exercise and nutrition, difficulties in job and social relationships, and even suicide attempts (2, 5). Furthermore, university students are undergoing a demanding phase of life and a crucial stage of development with long-lasting life decisions. In this transitional phase from youth to adulthood, they may be more prone to experiencing increased psychological distress and general mental health problems. At this phase, several psychosocial stress factors (e.g., difficulties in the mastery of life, intimate relationships, starting a family, or financial problems) and accumulated life experiences may reduce the students' psychological health and quality of life. Together with generally demanding university studies, these factors may increase the risk of psychological problems (29). In university student population studies, the factors reported to be associated with psychological distress are female gender, full-time student status, the final year before an undergraduate degree, and financial problems (7).

There are many reasons why we expected to see an increasing trend in prevalence rates. During the past 10 years, there have been rapid social and socioeconomic changes with effects on lifestyle, working life, employment and education (13). The development of information technology, economic uncertainty, increased demands of working life and prolonged unemployment are also reflected in university environment creating more stress than before, even if the core of the university system and studies has remained somewhat the same (14). The threat of unemployment, short-term jobs, and financial problems may lead to habitual competition and pressure to be continuously productive, with accompanying feelings of inadequacy and psychological distress (12, 14). This stressful life phase of study years, together with the multiple socioeconomic changes may partly explain the increased psychological distress among students in the first decade of this millennium, as observed in the present study. On the other hand, another more positive explanation for the changes in the prevalence rates is possible, which is related to changes in students' attitudes towards mental health problems. If students are ready to identify their psychological problems and if these symptoms are generally more acceptable than before, they may be more willing to report them as well.

In the present study, the peak prevalence of different psychological symptoms was observed in 2008. However, the declining prevalence from 2008 to 2012 needs confirmation. It is possible

that the decreasing response rates over the years could have caused a bias in the results, thus being a main reason for this decline in prevalence. If the declining trend were confirmed in future studies, the explanation for this turn could be associated with the year 2008, when the economic situation changed dramatically in the western countries. If the declining prevalence can only be seen among Finnish university students, this positive result could perhaps be explained by the increased use of preventive health care services by university student populations. In the recent years, persistent attempts have been pursued by the Finnish Student Health Service to improve students' mental health services in cooperation with academic staff and students.

Even if there are no previous trend analysis studies concerning the psychological distress of university students, and given the fact that the current results have to be confirmed in future studies, our study shows an increasing trend in the prevalence of psychological symptoms among university students. A simultaneous increase of different kinds of psychological symptoms may lead to difficulties that will continue later in adulthood, and should be taken into account for the purposes of preventing future difficulties in getting employed and maintaining one's working capacity.

In conclusion, psychological distress among Finnish university students appears to have increased during the first decade of the millennium. This suggests that interventions need to be developed in order to help students cope with different stress factors regarding their academic studies.

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Conflict of Interests

None declared

REFERENCES

1. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: a cross-sectional study. *Med Educ*. 2005 Jun;39(6):594-604.
2. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med*. 2006 Apr;81(4):354-73.
3. Hunt J, Eisenberg D. Mental health problems and help-seeking behavior among college students. *J Adolesc Health*. 2010 Jan;46(1):3-10.
4. Vázquez FL, Blanco V. Symptoms of depression and related factors among Spanish university students. *Psychol Rep*. 2006 Oct;99(2):583-90.
5. Verger P, Combes JB, Kovess-Masfety V, Choquet M, Guagliardo V, Rouillon F, et al. Psychological distress in first year university students: socioeconomic and academic stressors, mastery and social support in young men and women. *Soc Psychiatry Psychiatr Epidemiol*. 2009 Aug;44(8):643-50.
6. Adlaf EM, Gliksman L, Demers A, Newton-Taylor B. The prevalence of elevated psychological distress among Canadian undergraduates: findings from the 1998 Canadian Campus Survey. *J Am Coll Health*. 2001 Sep;50(2):67-72.
7. Stallman HM. Psychological distress in university students: a comparison with general population data. *Aust Psychol*. 2010 Nov;45(4):249-57.
8. Bernhardsdóttir J, Vilhjálmsdóttir R. Psychological distress among university female students and their need for mental health services. *J Psychiatr Ment Health Nurs*. 2013 Oct;20(8):672-8.
9. Nerdrum P, Rustøen T, Rønnestad MH. Student psychological distress: a psychometric study of 1750 Norwegian 1st-year undergraduate students. *Scand J Educ Res*. 2006 Feb;50(1):95-109.

10. Eisenberg D, Golberstein E, Gollust SE. Help-seeking and access to mental health care in a university student population. *Med Care*. 2007 Jul;45(7):594-601.
11. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge. *Lancet*. 2007 Apr 14;369(9569):1302-13.
12. Tosevski DL, Milovancevic MP, Gajic SD. Personality and psychopathology of university students. *Curr Opin Psychiatry*. 2010 Jan;23(1):48-52.
13. Vuorenkoski L, Mladovsky P, Mossialos E; World Health Organization; European Observatory on Health Systems and Policies. Finland: health system review. *Health Systems in Transition*, vol.10, no. 4. Copenhagen: WHO; 2008.
14. Piha K. Can you stand it ? Young people on the threshold of the working life. Publication of Finnish Business and Policy Forum. Helsinki: University Press; 2009. (In Finnish.)
15. Oksanen AM, Laimi K, Löyttyniemi E, Kunttu K. Trends of weekly musculoskeletal pain from 2000 to 2012: National study of Finnish university students. *Eur J Pain*. 2014 Oct;18(9):1316-22.
16. Goldberg D. The detection of psychiatric illness by questionnaire: a technique for the identification and assessment of non-psychotic psychiatric illness. London, New York: Oxford University Press; 1972.
17. Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychol Med*. 1997 Jan;27(1):191-7.
18. Holi MM, Marttunen M, Aalberg V. Comparison of the GHQ-36, the GHQ-12 and the SCL-90 as psychiatric screening instruments in the Finnish population. *Nord J Psychiatry*. 2003;57(3):233-8.
19. Penninkilampi-Kerola V, Miettunen J, Ebeling H. A comparative assessment of the factor structures and psychometric properties of the GHQ-12 and the GHQ-20 based on data from a Finnish population-based sample. *Scand J Psychol*. 2006 Oct;47(5):431-40.
20. Bue Bjorner J, Søndergaard Kristensen T, Ort-Gomér K, Tibblin G, Sullivan M, Westerholm P. Self-related health: a useful concept in research, prevention and clinical medicine. Report / Forskningsrådsnämnden 96:9. Stockholm: Swedish Council for Planning and Coordination of Research; 1996.
21. Manderbacka K. Questions on survey questions on health. Stockholm: Swedish institute for social research; 1998.
22. Kunttu K, Huttunen T. Student Health Survey 2000: a national survey among Finnish university students. Helsinki: Finnish Student Health Service; 2001. (In Finnish.)
23. Kunttu K, Huttunen T. Student Health Survey 2004: a national survey among Finnish university students. Helsinki: Finnish Student Health Service; 2005. (In Finnish.)
24. Kunttu K, Huttunen T. Student Health Survey 2008: a national survey among Finnish university students [Internet]. Helsinki: Finnish Student Health Service; 2009 [cited 2016 Aug 16]. Available from: http://www.yths.fi/filebank/354-Kunttu_OTT_2008.pdf. (In Finnish.)
25. Kunttu K, Pesonen T. Student Health Survey 2012: a national survey among Finnish university students [Internet]. Helsinki: Finnish Student Health Service; 2013 [cited 2016 Aug 16]. Available from: http://www.yths.fi/filebank/1864-KOTT_2012_verkkoon.pdf. (In Finnish.)
26. De Heer W. International response trends: results of an international survey. *J Off Stat*. 1999;15(2):129-42.
27. Tolonen H, Helakorpi S, Talala K, Helasoja V, Martelin T, Prättälä R. 25-year trends and socio-demographic differences in response rates: Finnish adult health behaviour survey. *Eur J Epidemiol*. 2006;21(6):409-15.
28. Bayram N, Bilgel N. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Soc Psychiatry Psychiatr Epidemiol*. 2008 Aug;43(8):667-72.
29. Wong JG, Cheung EP, Chan KK, Ma KK, Tang SW. Web-based survey of depression, anxiety and stress in first-year tertiary education students in Hong Kong. *Aust N Z J Psychiatry*. 2006 Sep;40(9):777-82.

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