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Disability Weights and Years Lived with Disability of Depression with and Without Suicidality

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ABSTRACT

Background: Globally, depression is a silent epidemic, and more than 350 million people suffer from depression. For a long time, the belief prevailed that children and young people cannot suffer from depressive disorders, and depression is slowly becoming one of the leading health problems among the young population. **Objective:** The research aims to determine the mental health disorders burden attributed to depression with and without suicidal ideation among youth in Bosnia and Herzegovina. **Methods:** A prospective cross-sectional study was performed as screening of depression by Hamilton standardized screening instrument from 3 May 2018 to April 4, 2019, among young people, students in secondary school, and the Faculty of Pharmacy and Medical Faculty of the University of Tuzla, in the most-populous Tuzla Canton in The Federation of Bosnia and Herzegovina. The subject sample consisted of 1141 young people, in secondary schools, or Faculty of Pharmacy and Medicine students with a mean age of 20,69 years (about 78% young women). In achieving the research goals, we expressed the burden attributed to depression with and without suicidality as Disability Weight (DW) and Years Lived with Disability (YLD). For the population level, YLD was calculated by multiplying DW by the prevalence rate of depression per thousand of the population (YLD= DW X PREVALENCE/1000), and DW was adjusted for suicidality. **Results:** The prevalence of depressiveness feeling among young people ages 19-21 is 47,10%. Very interesting is that there not found significant differences in the prevalence rate of suicidality between women and men (12,15% vs. 12,30%; P= 0.948). The highest YLD of depression (117,75, 95%CI, 106,32-128,01), and suicidality (98.05, 95%CI, 90,83-105,67) have been found in young people ages 19-21. YLD for mild depression (145,31, 95%CI,139,11-154,10) is the highest concern for the most severe form of depression (12,50, 95%CI, 11,46-13,99). **Conclusion:** Based on our findings, the very high burden of depression in Bosnia and Herzegovina was found greatly not recognized and unsolved problem among the young population aged 16-24 years. Recognizing and screening depression in young people is the first step to prevention.

Keywords: disability of depression, suicidality.

1. BACKGROUND

Globally, depression is a silent epidemic, and more than 350 million people suffer from depression (1). For a long time, the belief prevailed that children and young people cannot suffer from depressive disorders, and depression is slowly becoming one of the leading health problems among the young population (2). In the Global Burden of Disease 2019, self-harm is the leading cause of death for adolescent girls, and suicide is the leading cause of death for girls and women between the ages of 15 and 19 worldwide (3). Depression usually begins between the ages of 10-24 and expresses by somatic complaints, fatigue, boredom, apathy, disordered eating, lack of motivation, reduced concentration, and anxiety (4). In the youth population, depression is often unrecognized, untreated, and undertreated (5-7). Young people's depression is associated with an increased risk of other psychiatric disorders, poor academic, social, and work functioning, abuse of various addictive substances, suicide, and, unfortunately,

can be associated with homicide (8-10). Untreated or unrecognized depression leads to over 800 000 suicide deaths per year among young people aged 15-29 worldwide (11-12). Much previous research shows the association between social differences and poor mental health (13). Adverse outcomes associated with depression in young people include depression recurrence, the onset of other psychiatric disorders, and protracted impairments in interpersonal, social, educational, and occupational functioning (14).

The burden of disease can be quantified in several ways. First, at the individual level as the severity of Disability Weight (DW). DW quantifies the severity of disease-related health loss on a scale from 0 (no disability) to 1 (completely disabled). DW is important for researchers because they present a realistic picture of how much an individual suffers from poor health in everyday life. Years Lived with Disability (YLD) found the total number of years lived with disability-attributed disorders at the population level per thousand inhabitants. YLD is important to public health professionals because these indicators include the number of people affected by a disease multiplied by the DW of that disease (15). YLD represents the number of years of healthy life lost due to disability caused by the non-fatal experience of disease or injury in a population (16). Estimating Then measuring YLDs for mental and behavioral disorders, it is substantial to apply updated DWs according to disease severity (17-19). The burden of depression among young people is not enough investigation.

2. OBJECTIVE

This research aims to determine the mental health disorders burden attributed to depression, anxiousness, and fear with and without suicidal ideation among youth in Bosnia and Herzegovina.

3. MATERIAL AND METHODS

A prospective cross-sectional study was performed as screening of depression by Hamilton standardized screening instrument from May 3, 2018, to April 4, 2019, among young people, students in secondary schools, and the Faculty of Pharmacy and Medical Faculty of the University of Tuzla in the most populous Tuzla Canton in the Federation of Bosnia and Herzegovina. In achieving the research goals, we expressed the burden attributed to depression with and without suicidality, anxiousness, and fear as Disability Weight (DW) and Years Lived with Disability (YLD). For the population level, YLD was calculated by multiplying DW by the prevalence rate of depression, anxiousness, and fear per thousand of the population (YLD= DW x prevalence/1000), and DW was adjusted for suicidality. The calculation of DW uses linear regression analysis with a 95% confidence interval. The mean value of DW describes the level of disability as a result of impairment ranging from 0 (no disability) to 1 (completely disabled). The disease burden is expressed at the population level as years lived with disability (YLD) (15). Finally, all analyzes were based on raw (unadjusted) DWs as well as adjusted DWs (depression with and without suicidal ideation).

Subjects

A study subject sample has formed using the random sample method, and the inclusive factor for respondents was the age from 16-24 and voluntary participation. The expected number of respondents was 1505 young people who participated (all who voluntarily agreed to participate), randomly selected from a population of young people. Before the screening, the respondents received extensive information about the study's aim and screening, and a total of 1505 participants provided written informed consent. Of these, 1141 were included in the study because they filled in complete age and gender data and screening scales and are not older than 24 (response rate 75.8%). A plurality of the study participants consisted of females (77.9 %).

This research data was collected using the anonymous and voluntary participation of all respondents in questionnaire surveys and written informed consent from the parents of each adolescent aged 16-18 years. This study by written authorization from the Ministry of Education, Science, Culture and Sport of Tuzla Canton and the head of each participating school and University authorized. Subjects' survey information contained basic information about the research, purpose, procedure, confidentiality, rights, and voluntariness. The participation of all respondents was voluntary and anonymous throughout the collection of study data, in the part of questionnaire surveys. The ethical committee of the Faculty of Pharmacy, Tuzla University, the approval obtained.

Measures

Respondents completed questionnaires assessing demographics, depression with and without suicidal ideation, anxiousness, and fear. The demographic variable has been measured: age in three age subgroups (16-18, 19-21, 22-24 years); gender in two (young women and young men); and education-state (secondary school students, university students, and university failure). We analyzed the psychological needs of the subjects in the following variables: satisfaction with life (very unhappy, dissatisfied, neither satisfied nor dissatisfied, satisfied, and very satisfied, and hope for the future, support of important persons, and secure monthly existence (answer yes and no for all).

Questionnaires as study instruments

To determine the degree of depression we used the Hamilton Depression Rating Scale (HRDS) (20-21). The author used the Hamilton scale translated into Bosnia and Herzegovina language in earlier research (22, 23). Is an indispensable tool in clinical research and clinical practice. It contains 17 numbered graded items (symptoms of depression) whose score is added. Interval score represents the HRDG categories of depression: 0-7 normal mental status; 8-13 mild depression; 14-18 medium to severe depression; 19-22 severe depression; and >22 points very severe depression (24,25).

Statistical analysis

We started our analysis by exploring the distributions, frequencies, and percentages for each of the numeric and categorical variables. For the analysis of the results

was used the software Statistical Package for Social Research (SPSS) version Ibm 19.0. All continuous variables are presented with basic descriptive statistical parameters (arithmetic mean, standard deviation, or median), while for categorical variables to calculate the percentages of individual values. Analysis of the normality of the distribution of continuous variables was performed Kolmogorov-Smirnov test, and according to these results, the corresponding parametric tests. The structure of the questionnaire was measured by factor analysis. The frequency differences of individual responses to categorical variables are expressed in the nominal level $\chi 2$–test. Multivariate logistic regressions were used to identify DWs-independent associations with depressive symptoms and presented as odd ratios (OR) with 95% confidence intervals (CI). A p-value <0.05 was set as the threshold of statistical significance. A P-value of <0.05 was considered statistically significant.

Mental disorders	Male (N=252) No (%)	Female (N=889) No (%)	Total sample (1141) No (%)	P-value $\chi 2$ test*
Depression (severity)				
absent	173 (68,66)	488 (54,89)	661 (57,94)	0,002
mild	51 (20,23)	228 (25,65)	279 (24,45)	(16,704)
moderate	19 (7,53)	109 (12,26)	128 (11,22)	
severe	6 (2,39)	43 (4,84)	49 (4,29)	
serious	3 (1,19)	21 (2,36)	24 (2,10)	
Depression with suicidality				
absent	221 (87,70)	781 (87,85)	1002(87,82)	0,948
suicidal ideation	31 (12,30)	108 (12,15)	139 (12,18)	0,004

Table 1. Prevalence rate and differences of depression with and without suicidality between participants per gender. *Chi Quadrate test, $\chi 2$ test

Mental disorders Age group (years)	16-18 (N=144) No (%)	19-21 (N=811) No (%)	22-24 (N=186) No (%)	Total sample (N=1141) No (%)	P-value*
Depression					
no	114 (79,17)	429 (52,90)	118 (63,45)	661 (57,94)	0,001
mild	21 (14,58)	213 (26,26)	45 (24,19)	279 (24,45)	(54,22)
moderate	0 (0,00)	115 (14,18)	13 (6,99)	128 (11,22)	
severe	3 (2,08)	39 (4,81)	7 (3,76)	49 (4,29)	
serious	6 (4,17)	15 (1,85)	3 (1,61)	24 (2,10)	
Depression with suicidality					
no	129 (89,58)	699 (86,19)	174 (93,55)	1002 (87,82)	0,042
suicidal ideation	15 (10,42)	112 (13,81)	12 (6,45)	139 (12,18)	(8,177)

Table 2. Prevalence rate and differences in depressiveness between participants per age-groups. *Chi Quadrate test, $\chi 2$ test

4. RESULTS

The participants' ages ranged from 16 to 24 years, with a mean of 20,6 ± 1,9 years. The Body mass index (BMI) of 21,9 ± 2,7 is the recommended reference value of 18.5–24.9 kg/m2. The depression score of all participants ranged from 0 to 32 with a mean of 7.4± 6.3, which for our population of respondents at the sample level implies entry into the zone of presence of depressive symptoms (Table 1).

Descriptive statistics and differences per gender in sociodemographic variables (age, education state, and secure monthly existence); and modified factors attributed to satisfaction needs (life satisfaction, hope for the future, support from person of influence) (Table 2). Most participants belong to the age group 19-21 years, 71,44% (n=180), and the same 14,28% (n=36) other age groups (16-18 and 22-24 years), and sixty-two percent of participants are university students, and twenty percent are university failures. The diploma of secondary school level of education has 17,5%,

Disability Weight (DW)	Prevalence /1000 (95%CI) *	YLD† (95% CI)
Depression without suicidality **DW**= 0,25, 95%CI, 0,24- 0,26	420,67 (414,32-439,4)	105,17 (99,67-112,14)
Depression of young women	451,07 (444,13-463,4)	112,77 (103,86-122,66)
Depression of young men	313,48 (299,81-319,40)	78,37 (67,77-89,34)
Depression in ages 16-18	208,32 (199,1-212,4)	52.08 (46,22-57,11)
Depression in ages 19-21	471,01 (454,1-463,4)	117,75 (106,32-128,01)
Depression in ages 22-24	365,99 (356,66-369,84)	91,49 (82,47-99,98)
Depression with suicidal ideation DW=0.71, 95%CI, 0.70- 0.72	121,82 (117,12-127,42)	86,49 (81,32- 92,65)
Depression of a young women	121,15 (115,14-126,34)	86,25 (81,36- 95,68)
Depression of a young man	123,01 (119,13-127,37)	87,33 (84,31- 89,69)
Depression in ages 16-18	104,17 (99,36-107,63)	73,96 (66,83- 79,00)
Depression in ages 19-21	138,10 (130,19-141,98)	98,05 (90,83- 105,67)
Depression in ages 22-24	64,52 (57,15-68,42)	45,81 (39,83- 48,00)

Table 3. Disability Weight (DW) and Years Lived with Disability (YLD) of depression with and without suicidal ideation per gender and age- groups. *95% Confidence Interval, 95%CI, †Years Lived with Disability, YLD‡ Disability Weight, DW

Symptoms of mental disorders	Severity/ Frequency of mental disorders	No (%)	Prevalence/1000 95%CI	YLD/1000 (95% CI)
Depression	Mild depression	279 (58.12)	581.25 (571.16- 593.76)	145.31 (139.11-154.10)
N=480 (43.10%)	Moderate depression	128 (26.66)	266.67 (259.83-281.43)	66.66 (57.9- 68.09)
DW 0.25	Severe	49 (10.20)	102.08 (99.89-105.41)	25.52 (23.46- 27.52)
	Serious	24 (5.00)	50.00 (48.32-56.41)	12.50 (11.46- 13.99)
Suicidal ideas	Life is not worth living	67 (51.94)	519.37 (505.66-573.48)	368.75 (349.35-372.22)
N=129 (11.19%)	To want to die	47 (36.43)	364.34 (359.13- 377.64)	258.68 (236.23- 266.55)
DW 0.71	Shows suicidality	9 (6.97)	69.77 (68.27.73.12)	49.54 (47.97- 51.87)
	Suicide attempt	5 (3.87)	38.75 (36.65-42.77)	27.51 (25.83- 29.33)

Table 4. Years Lived with Disability (YLD) of depression with and without suicidal ideation, anxiousness, and fear per the severity of depression with or without suicidal ideation or frequency of anxiousness and fear

and sixty-three percent of respondents have a secure monthly income. Among the respondents, 10% are very dissatisfied, 11% are dissatisfied with life, and 33% fells neither satisfied nor dissatisfied. Twenty percent of respondents lost hope in the future. They have no support from a person of influence, 12% (Table 2).

Table 3 presents the prevalence rate and differences in depression and anxiousness per categorization between participants per gender. The young women significantly most often suffered depression at 45%, concerning young men at 31% (P=0.002), a particularly severe form of depression (4,84% vs. 2,39%), and serious depression (2,36% vs. 4,84%). Very interesting is that there not found significant differences in the prevalence rate of suicidality between women and men (12,15% vs. 12,30%; P= 0.948).

Table 4 presents the prevalence rate and differences in depression per categorization between participants' age groups. The young people ages 19-21 most often feel depressiveness, almost half of them (47,10%). Participants aged 19-21 most often suffered severe depression levels of depression (4.81%), as serious depression (1.85%), then younger and older ones. There are significant depression differences between young people regarding ages (P=0.001). Suicidal ideas are most often present in the ages of 19-21 (13.81%).

Table 5 presents the Years Lived with Disability (YLD) of depression with and without suicidal ideation and anxiety per gender and group of age. A disability weight (DW) of depression without suicidality in the total sample was 0,25 (95% CI, 0,24-0,26), the prevalence of depression 420,67/1000, and YLD 105,17 (95% CI, 99,67-112,14). YLD in girls 112,77 (95% CI, 103,86-122,66) was higher than YLD in boys 78,37 (95%CI, 67,77-89,34). The highest YLD of depression has found in ages 19-21, 117.75 (95%CI, 106,32- 128,01), in relationship to the YLD in ages 16-18, 52,08, and YLD in ages 22-24, 91,49. The YLD of depression with suicidal ideation (the DW=0,71) among all participants was 86,25 (95% CI, 81,32–92,65). In addition, the YLD of depression without suicidal ideation 105,17 remained significantly more considerable than the YLD of depression without suicidality.

Table 6 presents years of lived with disability (YLD) attributed to the severity state of depression with and without suicidality per gender and age group. The results of this table are inversive because of unexpectedly higher YLDs for the mildest form of depression. For example, YLD for mild depression is the highest concern for the most severe form of depression (YLDs of mild depression vs. moderate depression vs. severe depression vs. serious depression=143,31 vs. 66,66 vs. 25,52 vs. 12,50). Very similar is in the case of depression with suicidal ideation (YLDs of perception that life is not worth living vs. to want day vs. show suicidality vs. suicide attempt=368,75 vs. 258,68 vs. 49,54 vs. 27,51).

5. DISCUSSION

This study assessed the severity of disability (DW) and years lived with disability (YLD) due to depression with and without suicidal ideation in 1141 young people with a mean age of 20,69 years (about 78% of young women) in Bosnia and Herzegovina. About fifty percent of them were unsatisfied with life, thirty percent were without hope for the future, eleven percent were without support from the influenced person, and thirty-six percent were without secure monthly existence. Depressive disorders cause more distress and impairment of daily activities (26-27), especially when depression is accompanied by suicidal ideation (28-30). Approximately 40% of American and Arabic adolescents and young people with depression also suffer anxiety (31-32). DWs of depression without suicidal ideation among Bosnia and Herzegovina young people (0,25, 95% CI, 0.24-0.26) was almost the same as DW among Nederland's young people (0,26, 95% CI=0,25–0.26) (26). Moreover, the DW of depression with suicidal ideation (0,71, 95% CI=0.69–0.72) was significantly higher than the DW of depression with suicidal ideation (0,30, 95% CI, 0.29-0,30) in Nederland's young people (26).

Self-harm is the leading cause of death for adolescent girls worldwide, and suicide is the leading cause of death for girls and women between the ages of 15 and

19 worldwide (33, 27, 28, 34). We found that our young people in age 19-21 have been with the highest prevalence of depression 47,10%. The disability weights (DW) of depression without suicidal ideation (0,25, 95% CI, 0.24-0.26) was almost the same as DW among Nederland's young people (0,26, 95% CI=0,25–0.26). Moreover, the DW of depression with suicidal ideation (0,71, 95% CI=0.69–0.72) was significantly higher than the DW of depression with suicidal ideation (0,30, 95% CI, 0.29-0,30) in Nederland's young people (26). Inversely, in our young people suicidality is equally represented in both sexes, and the highest YLD attributed suicidality was found in ages 19-21, 98.05 (95% CI, 90,83-105,67). When we measured YLDs per the severity of depression with or without suicidal ideation found the highest YLDs of mild depression 145,31.

This study has several strengths. First, our sample of respondents allowed us to examine the burden of YLD of depression for young women and men, as well as the severity of these disorders. Second, to our knowledge, we were the first to examine the burden of depression (DW, YLD) with and without suicidal ideation in young people in Bosnia and Herzegovina. Also, we assessed the disease burden on an individual and population level.

This study has several limitations. First, we focused on the non-fatal disease burden ignoring years of life lost (YYL) due to premature death caused by suicidal attempts because we did not have the necessary information in our dataset. We calculated the YLD using the prevalence rate instead of the incidence multiplied by the time spent with that health disorder. Assessment of values for self-report questionnaires (particularly cut-off values), we may have biased the results.

6. CONCLUSION

Based on our findings, the very high burden of depression in Bosnia and Herzegovina was found greatly not recognized and unsolved problem among the young population aged 16-24 years. Recognizing and screening depression in young people is the first step to prevention.

Participant's Consent Form: All participants were informed about the objective of the study.

Author's Contributions: authors gave a substantial contribution to the conception of the work in the acquisition, analysis, and interpretation of data preparing for drafting intellectual content; and N.P. gave final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the integrity of any part of the work are appropriately investigated and resolved.

- **Patient Consent Form:** All participants were informed about subject of the study.
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