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Impact of mindful self-care and perceived stress on the health related quality of life among young-adult students in West Virginia

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ABSTRACT

There are substantial gaps in research on Health Related Quality of Life (HRQoL) in students aged 18 and above in West Virginia. The purpose of this study is to explore the associations between mindful self-care, perceived stress, and the HRQoL in this population. We conducted a cross-sectional study between March and April 2017. We included participants who were students, aged 18 years and above, living in West Virginia and were able to answer online questions in English. Data was obtained from an online survey using a structured questionnaire, including the SF12v2®, mindful self-care scale- SHORT, and Perceived Stress Scale (PSS)-10. We applied linear regressions to determine the predictors of HRQoL (physical health and mental health) using SF12v2®. 194 participants met the inclusion criteria of the study. Mindful self-care was negatively associated with perceived stress. Better mindful self-care mediated the relationship between perceived stress and psychological well-being, controlling for gender, age, race, marital status, education level, annual household income, and chronic disease status. Perceived stress and mindful self-care were not related to the physical well-being. Better mindful self-care may safeguard against perceived stress among students aged 18 years and above. Our findings in this study recommend more mindfulness-based interventions targeted to this subpopulation to improve psychological well-being.

KEYWORDS

Health related quality of life; mindful self-care; stress; student

Introduction

According to the Centers for Disease Control and Prevention (CDC), the Department of Health and Human Services established a national program "Healthy People 2020" to promote health-related quality of life (HRQoL) across all life stages (CDC, 2010). Among all these stages, the transition stage to adulthood could be characterized by dramatic life changes, for example, the time in college or university as a student (Sabbah, Sabbah, Khamis, Sabbah, & Droubi, 2013). Students aged 18 and above may encounter plenty of academic, social, and emotional stress that can affect their physical and psychological well-being. In recent years, there has been an increased rate of stress among university students. The prevalence of stress among medical students was 71.9% according to a previous study (Sani et al., 2012). For decades, researchers have conducted

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research on stress and its relationship with psychological distress, psychiatric disorder and other health problems (Wheaton, 1994). However, there are limited studies focusing on students aged 18 and above in regard to the stress and HRQoL.

Self-care can raise awareness and provide an opportunity to improve HRQoL. Self-care is defined by the World Health Organization as what "people do for themselves to establish and maintain health and to prevent and deal with illness" (World Health Organization (WHO), 1998). Shrivastava et al. identified seven necessary self-care behaviors, which predict good clinical outcomes in the diabetic population (Shrivastava, Shrivastava, & Ramasamy, 2013). Additionally, in a previous study, it was found that young people preferred self-care to resolve emotional distress (Martorell-Poveda, Martinez-Hernáez, Carceller-Maicas, & Correa-Urquiza, 2015). Mindful self-care adds the concept of "mindful awareness" in the components of "self-care" (Cook-Cottone, 2015). It is managed by mindful awareness in an iterative process with attention and assessment of one's own needs in specific practices of self-care. Mindfulness is about internal awareness of one's own cognitions and emotions and the external awareness of one's environment (Richards, Campenni, & Muse-Burke, 2010). The steady and intentional practice of mindful self-care can improve an individual's physical and psychological well-being (Cook-Cottone, 2015). Mindful self-care (e.g., breath awareness, mindful sketching) can have a significant impact in impeding the deleterious effects of stress on psychological distress in students (Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003).

Furthermore, many young adults in West Virginia (WV) are at a higher risk of developing chronic disease, and requiring multiple drugs for treatment (Feng et al., 2017), which may affect their well-being. In addition, more than 50% of students in a sample from West Virginia University reported a relative high perceived stress, which was correlated with worse perceived health status (Feng, Alenzi, & Dwibedi, 2016). Still, there are substantial gaps in research on the HRQoL, especially the mental health component, in students aged 18 and above in WV. Thus, the purpose of this study is to explore the associations between mindful self-care, perceived stress, and the HRQoL in students aged 18 and above in West Virginia.

Methods

Study design and population

This was a cross-sectional online survey conducted between March and April 2017. We included students aged 18 years and above, who lived in West Virginia and were able to answer online questions in English. The Health Related Quality of Life theoretical framework model described by Wilson and Cleary was used in this study (Wilson & Cleary, 1995). Health related quality of life can be affected by the symptoms (e.g., stress symptoms), general health perceptions, characteristics of individuals (e.g., physical care, mindful awareness, self-compassion), and characteristics of the environment (e.g., supportive relations, supportive structure).

Procedure

This study was reviewed and approved by the West Virginia University (WVU) Institutional Ethical Review Board (IRB). A Web-based online survey was administered using Qualtrics® software (Qualtrics, version 2017, Provo, Utah). Data from potential participants was collected

through web-based announcement and social media feeds. Written consent was obtained from participants before administration of the questionnaire. It took 10 to 15 minutes to complete the questionnaire. Participation was voluntary, and participants could stop the survey at any time. Resources for counseling were provided for those who needed help.

Measures

Outcome variable

Health related quality of life (HRQOL) was measured using the SF-12 version 2 Health Survey (SF-12v2®). Permission was obtained to use the instrument. The SF-12v2® is a self-reported generic questionnaire that measures eight domains of health related quality of life, which includes physical function, role physical, bodily pain, general health perception, vitality, social functioning, role emotional, and mental health. The SF-12v2® measure summarizes all eight items into two composite scores (physical composite score [PCS] and mental composite score [MCS]) (Ware, Kosinski, Turner Bowker, & Gandek, 2002). This scale has been validated in the US general population. The Cronbach alpha for both PCS and MCS were 0.89 and 0.86, respectively (Ware, Kosinski, Turner, & Gandek, 2002).

Independent variables

Mindful self-care

A 33-item mindful self-care scale (MSCS) was used (Permission of using this scale and scoring system were obtained from Dr. Cook-Cottone). (Cook-Cottone & Guyker, 2018). This scale is a self-reported questionnaire that measures six domains of mindful self-care, which includes physical care, supportive relationships, mindful awareness, self-compassion and purpose, mindful relaxation, and supportive structure (Cook-Cottone & Guyker, 2018). For example, participants were requested to answer the question: "This past week, how many days did I do the following? I drank at least 6 to 8 cups of water." The response was rated on a five-point scale, "never (0 days)", "rarely (1 day)", "sometimes (2 to 3 days)", "often (4 to 5) days", and "regularly (6 to 7 days). An average score for each subscale (range [physical care]: 8–40; range [supportive relationships]: 5–25; range [mindful awareness]: 4–20; range [self-compassion and purpose]: 6–30; range [mindful relaxation]: 6–30; range [supportive structure]: 4–20) was calculated and summed to obtain a total score (range: 33–165). Higher scores for the scale, as well as each subscale, indicates better mindful self-care practices. The internal consistency reliability (Cronbach's coefficient alphas) were 0.89 for the total 33-item MSCS, 0.84 for physical care, 0.86 for supportive relationships, 0.92 for mindful awareness, 0.83 for self-compassion and purpose, 0.77 for mindful relaxation, and 0.77 for supportive structure (Cook-Cottone & Guyker, 2018).

Perceived stress

Perceived Stress was measured by the Perceived Stress Scale (PSS)-10 (Cohen, Kamarck, & Mermelstein, 1983). It is a 10-item self-reported questionnaire that measures the perception of stress. Questions such as "In the last month, how often have you been upset because of something

that happened unexpectedly?" and "In the last month, how often have you felt that things were going your way?" were asked using the PSS-10. The response scale is a 5-point Likert scale ranging from 0 (never) to 4 (very often). The total score of PSS-10 is obtained from each item and summed across all, and it ranges from 0 to 40. The higher score indicates higher perceived stress. A score of 20 and above indicates high perceived stress, which may require stress reduction strategy. This scale has been validated in a sample of university students in the U.S. with a Cronbach's alpha of 0.83 (Remor, 2006).

Other independent variables

Other covariates included age, gender (female, male), marital status (married/a member of an unmarried couple married, never married/divorced/widowed/separated), level of education (Bachelor's degree and above, below), annual household income ($35,000 and above, below), race/ethnicity (White, Other), smoking status (Yes, No), alcohol consumption (Yes, No), and health care insurance coverage (Yes, No), and current chronic condition (Yes, No). Participants were asked to indicate the specific diagnosed diseases according to a list of chronic conditions (Appendix 1) and if the conditions were resolved. We identified the existence of chronic conditions if participants reported that they had a chronic disease which was not resolved. The chronic conditions were further classified as the physical and mental conditions respectively (Appendix 1).

Statistical analysis

The mean (SD) and frequency (percentage) were reported for continuous and categorical variables respectively. In bivariate analyses, Pearson -moment correlations for continuous variables and two-sample tests for categorical variables were used to analyze the relationship between the independent variables and the HRQoL. Multiple linear regression models were used to analyze the relationship between mindful self-care, perceived stress, and HRQoL, controlling for the other independent variables. All analyses were performed using Statistical Analysis System (SAS 9.3 for Windows; SAS Institute Inc., NC, USA).

Results

Our sample was extracted from an online self-care survey. In this self-care survey, 481 subjects clicked the link and 474 subjects were interested in completing the survey. A total of 427 subjects completed the survey by the end of April. The completion rate was 90.1% (427/474). Of the 427 participants, 194 respondents met the inclusion criteria. The proportion of WV counties covered by the study sample was 38.2% (21/55) (Appendix 2); most of them (58.2%) were from Monongalia County where West Virginia University is located. The majority of participants in our study were female (71.1%), White (87.6%), never married (59.3%), had a Bachelor's degree or above (56.2%), with annual household income less than $35,000 (51.5%), covered by a health insurance (99.0%), and without a chronic condition (68.6%) (Table 1). Around 20% of participants reported a mental condition. Self-reported depression accounted for 17% of the total sample (data not presented in Table). The average age was 23.5 ± 4.8 (range: 18 to 44) years old. The mean scores were 56.2 ± 6.4 and 39.2 ± 12.4 for the physical component score and a mental component score of the HRQoL. The mean scores of perceived stress and mindful self-care were

Table 1. Descriptive statistics (N = 194).

	N	%
Gender		
Female	138	71.1%
Male	56	28.9%
Race		
White	170	87.6%
Non-white	24	12.4%
Marital status		
Not single	76	39.2%
Single	118	58.8%
Education		
Bachelor and above	109	56.2%
Less than Bachelor	85	43.8%
Annual house income		
$35,00 and above	131	67.5%
below	63	32.5%
Smoking status		
yes	18	9.3%
no	176	90.7%
Alcohol consumption in the past month		
yes	137	70.6%
no	50	25.8%
Don't know	7	3.6%
Current chronic condition status		
Yes	61	31.4%
No	133	68.6%
Physical conditions		
Yes	37	19.1%
No	157	80.9%
Mental conditions		
Yes	37	19.1%
No	157	80.9%
	Mean	SD
Age	23.5	4.8
Perceived stress score	21.6	7.9
Mindful self-care score	105.3	18.1
physical care	23.2	5.0
supportive relationships	20.0	4.1
mindful awareness	13.2	3.9
self-compassion and purpose	18.4	5.1
mindful relaxation	16.8	4.5
supportive structure	13.7	3.9
PCS	56.2	6.4
MCS	39.2	12.4

Note. Single: never married/divorced/widowed/separated; not single: married/a member of an unmarried couple married. Abbreviation: PCS: Physical composite score; MCS: mental composite score; SD: standard deviation

21.6 ± 7.9 and 105.3 ± 18.1, respectively (Table 1). Among all the participants, one hundred and eleven (57.2%) had high perceived stress. In the domains of the mindful self-care, the average scores were neither high nor low. For example, the average score of physical care was 23.2 (SD = 5.0). However, in this domain, 69.1% of the participants reported no mind/body practice (e.g., yoga, Tai Chi) in the past seven days (data not presented in the Table).

In the bivariate analyses, we found a positive correlation between mindful self-care and psychological well-being (Table 2). Perceived stress, being a female, age, with a degree below Bachelor's, having annual household income below $35,000, and having at least one chronic condition were found to be negatively related to psychological well- being. All items in supportive relationships, mindful awareness, self-compassion and purpose, and supportive structure were significantly correlated with psychological well-being. On the other hand, both mindful self-care

Table 2. Factors associated with HRQoL among students aged 18 and over in WV: results from univariate analyses (N = 194).

		Health Related Quality of Life			
		SF12v2®-PCS		SF12v2®-MCS	
		Correlation	P value	Correlation	P value
Age		0.03	0.68	0.16	**0.02**
Perceived stress score		0.03	0.66	−0.80	**<0.01**
Mindful self-care score		−0.01	0.89	0.60	**<0.01**
physical care		0.17	**0.02**	0.27	**<0.01**
supportive relationships		−0.06	0.38	0.46	**<0.01**
mindful awareness		0.02	0.83	0.60	**<0.01**
self-compassion and purpose		−0.05	0.52	0.48	**<0.01**
mindful relaxation		−0.12	0.10	0.18	**0.01**
supportive structure		−0.01	0.85	0.51	**<0.01**
	N	**Mean± SD**	**P value**	**Mean± SD**	**P value**
Sex			0.73		**0.02**
Male	56	55.9 ± 6.1		42.2 ± 10.6	
Female	138	56.3 ± 6.5		37.9 ± 12.9	
Race					
White	170	56.4 ± 6.2	0.33	38.9 ± 12.1	0.36
Other	24	54.4 ± 7.6		41.3 ± 14.4	
Marriage*					
Single	118	56.3 ± 5.8	0.73	38.9 ± 12.6	0.74
Not single	76	56.0 ± 7.2		39.5 ± 12.3	
Annual household income			0.72		**0.02**
$35, 000 and above	131	56.3 ± 6.1		40.6 ± 11.8	
below	63	56.0 ± 7.0		36.3 ± 13.1	
Education			0.89		**0.048**
Bachelor and above	109	56.1 ± 6.0		40.7 ± 11.8	
below	85	56.3 ± 6.0		37.2 ± 12.9	
Current chronic condition			**0.03**		**<0.01**
Yes	67	54.7 ± 7.3		35.4 ± 12.5	
No	127	57.0 ± 5.8		41.2 ± 11.9	
Smoking status			0.11		0.19
Yes	18	58.5 ± 5.3		35.5 ± 14.0	
No	176	56.0 ± 6.5		40.0 ± 12.2	
Alcohol consumption in the past month			0.07		0.80
Yes/Don't know	144	56.7 ± 6.3		39.0 ± 12.1	
No	50	54.8 ± 6.5		39.6 ± 13.3	

Note. Single: never married/divorced/widowed/separated; not single: married/a member of an unmarried couple married. Abbreviation: PCS: physical composite score; MCS: mental composite score, SD: standard deviation.

and perceived stress were not associated with physical well-being. Only physical care and not having a chronic disease were positively correlated with physical well-being. We also found that perceived stress was negatively correlated with mindful self-care ($r = -0.55$, $p < 0.001$), including all six domains ($p < 0.001$) except the mindful relaxation ($p = 0.15$) (Data not present in Table).

The results of multivariate linear regressions are presented in Table 3. In the regression models for PCS and MCS, model 1 included perceived stress and other covariates; model 2 added mindful self-care into the model 1. Perceived stress ($\beta = -1.20$, $p < 0.001$) was negatively associated with psychological well-being in the MCS- model 1 (R square: 0.66). Mindful self-care ($\beta = 0.15$, $p < 0.001$) attenuated the impact of perceived stress ($\beta = -1.01$, $p < 0.001$) on the psychological well-being when it was added in the MCS- model 2 (R square: 0.70). Better mindful self-care and less perceived stress were associated with better psychological well-being, controlling for the gender, age, race, marital status, education level, annual household income, chronic disease status, alcohol use and smoking status. Both perceived stress and mindful self-care were not related to the physical well-being after controlling for the covariates.

Table 3. Association between mindful self-care, perceived stress, and health related quality of life: results from multiple regression analyses (N = 194).

	PCS -Model 1		PCS -Model 2		MCS - Model 1		MCS- Model 2	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
intercept	52.03 (4.19)	<0.001	51.56 (5.84)	<0.001	68.14 (4.90)	<.0001	48.01 (6.47)	<.0001
Perceived stress	0.05 (0.06)	0.39	0.06 (0.03)	0.43	-1.20 (0.07)	<.0001	-1.01 (0.08)	<.0001
Mindful self-care	-		0.00 (0.03)	0.91	-	-	0.15 (0.03)	<.0001
Gender Male vs Female	0.48 (1.04)	0.64	0.47 (1.05)	0.65	-0.80 (1.22)	0.51	-1.39 (1.17)	0.23
age	0.05 (0.12)	0.66	0.06 (0.12)	0.65	0.11 (0.14)	0.43	0.15 (0.14)	0.28
White vs. other	1.29 (1.40)	0.36	1.29 (1.40)	0.36	-2.71 (1.63)	0.10	-3.00 (1.55)	0.06
Single vs. not single	0.65 (0.99)	0.52	0.64 (1.00)	0.52	0.57 (1.16)	0.62	0.48 (1.10)	0.66
Bachelor and above vs below	-1.49 (1.59)	0.35	-1.49 (1.59)	0.35	-0.76 (1.85)	0.68	-0.76 (1.76)	0.67
Annual household income $35, 000 and above vs. below	-1.35 (1.59)	0.40	-1.33 (1.60)	0.41	-1.25 (1.86)	0.50	-0.73 (1.77)	0.68
With chronic condition vs. no chronic condition	-2.43 (0.98)	0.01	-2.43 (0.98)	0.01	-2.14 (1.14)	0.06	-1.99 (1.09)	0.07
Alcohol use vs. no use	1.72 (1.08)	0.11	1.73 (1.08)	0.11	-0.41 (1.26)	0.74	-0.28 (1.20)	0.82
Smoking vs. not smoking	2.48 (1.63)	0.13	2.49 (1.63)	0.13	-4.92 (1.90)	0.01	-4.42 (1.81)	0.02

Note. Single: never married/divorced/widowed/separated; not single: married/a member of an unmarried couple married. Abbreviation: PCS: Physical composite score; MCS: mental composite score; SE: standard error.

Discussion

This study is amongst the first to assess HRQoL among students aged 18 and above in West Virginia and the combined impact of perceived stress and mindful self-care on the HRQoL. To our knowledge, mindful self-care has only been studied in four published research papers to date. This study helped to identify several important modifiable factors (i.e., mindful self-care practices) associated with HRQoL, which may provide evidence for further targeted interventions or university-based programs to improve the psychological wellbeing of students aged 18 and above (e.g., university students) in WV.

In our study, the psychological well-being was much lower compared to that of the general population, and population aged between 18 and 34 (our sample: general: general aged 18–34 = 39.2 ± 12.4: 50.0 ± 9.6: 49 ± 9.7). (Ware et al., 2008) The low mental composite score (MCS) in HRQoL indicates the severity of mental health issues among WV students aged 18 and above; around 20% of our sample reported a diagnosis of mental illness (e.g. depression). This statistic is in accordance with estimates from the WV Behavioral Risk Factor Surveillance System (BRFSS) that showed a prevalence of depression at 20.9% in the general WV population. This rate is higher than the average rate, at around 16%, in the United States. The WV BRFSS is a health related survey with a representative sample of WV population. (West Virginia Department of Health and Human Resources, 2012).

Furthermore, almost 60% of the students were identified with high perceived stress with a significant negative impact on their psychological well-being. Though stress can be exposed to any life stage of an individual, young students aged between 18 and 30 are perhaps more likely to be vulnerable to the effects of stress. Thus, how to cope with stress is critical in this transitional period - from high school to post-secondary institutions, and from the post-secondary institutions/high school to the job market. Furthermore, according to our findings, mindful self-care exerted an attenuated effect on the relationship between perceived stress and psychological well-being. This finding indicates that mindful self-care may be a potential strategy for stress management available to in students during this transitional period.

Among the six domains of mindful self-care, social support has long been known with a positive effect on buffering physical and psychological stress and had additional benefits to the health status of individuals (Broadhead et al., 1983). This association between supportive relationships and psychological well-being was also confirmed in our study. Also, our study showed that supportive structure, which measured the interaction with individuals' environment and external factors (e.g., balancing external demands, manageable schedule), was positively correlated with psychological well-being. Both domains of supportive relationships and supportive structure point out the need from the students' environment to improve their HRQoL.

Additionally, self-compassion was emphasized by Neff (2003) with a central aspect in its concept of treating oneself kindly when things go wrong. An individual with high self-compassion may be better at handling negative events and stress in life (Allen & Leary, 2010), which was similar to what we found in this study. Self-compassion was also identified as a mediator in the relationships between anxiety and mental health in a previous study (Raque-Bogdan, Ericson, Jackson, Martin, & Bryan, 2011). Thus, developing better self-compassion skills may relieve stress and improve the psychological well-being of the study population. Moreover, among the specific physical self-care practices,

no mind/body practices (e.g. yoga) were found in almost 70% of the participants in this study. Mindfulness-based interventions, including sitting meditation and mindful yoga had been demonstrated to improve psychological well-being (Sauer-Zavala, Walsh, Eisenlohr-Moul, & Lykins, 2013). These mindful-based strategies also appear to be well tolerated among patients with high level of distress (Mason & Hargreaves, 2001). Mindful awareness and mindful relaxation are the centering practices integrating both internal and external experience in the mindful self-care (Cook-Cottone & Guyker, 2018). Achieving a state of mindfulness is of importance to receive the full benefits of general well-being from self-care (Richards et al., 2010). In our study, mindful relaxation predicts better psychological wellbeing, however, is not associated with perceived stress. As compared with the other domains, the score of mindful relaxation was relatively lower. Perhaps, mindful relaxation has limited impact on relieving stress or more practice of mindful relaxation is required to exert effective influence.

Given the considerably poor mental health in the study population, we recommend to increase awareness of mindful self-care in academic settings and suggest promoting mindful self-care practices among students aged 18 and above in WV. Further research assessing the effectiveness of mindfulness-based programs that may be beneficial to students are needed. These mindful-based self-care strategies can be in a variety of formats (e.g., having a mindful awareness of everyday activities, practicing mindfulness in yoga, and body scan) that may need to address the physical care, self-compassion and purpose, mindful awareness, and mindful relaxation. In addition, a better supportive environment, including the social/emotional support, requires improvement. These might involve daily interactions between students and their families, peers, and faculty.

There are several limitations in this study. Convenience sampling may induce selection bias and concerns on the generalizability of our findings. In Appendix 1, we mapped the counties that covered by this study, though most of the students were from one county in WV. Given West Virginia University is the largest post-secondary institution in WV, the results of our study can reflect HRQoL and its associated factors among the study populations in this region. Secondly, there are limitations to using self-reported measures because of the social desirability and recall bias. We were also not able to validate participants' chronic condition status and severity.

Conclusion

Significantly poor psychological well-being and prevalence of perceived stress requires attention in students aged 18 and above in WV. Better mindful self-care may safeguard against perceived stress, and mediate the impact of stress on the psychological well-being of this population. Findings from our study recommend more mindfulness-based interventions targeted in the student/young adult population to achieve their better psychological well-being.

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Appendix A. List of physical and mental conditions

Physical condition	diabetes, hyperlipidemia, hypertension, COPD, coronary artery disease,, stroke or transient ischemic attack (TIA), tuberculosis, bronchitis, asthma, chronic hepatitis, peptic ulcer, gallstone/gall bladder disease, kidney disease, fracture, arthritis, osteoporosis.
Mental condition	psychiatric disorders, substance abuse disorders, depression
Other chronic conditions	other

Appendix B. Counties in West Virginia covered by the study sample