Student burnout and work engagement: a canonical correlation analysis

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Abstract

This school-based cross-sectional study, conducted among 872 grade thirteen students in Sri Lanka, assessed the complex relationship between burnout and work engagement using the validated Maslach Burnout Inventory-Student Survey (MBI-SS) and Utrecht Work Engagement Scale-Student Version (UWES-S). In canonical correlation analysis (CCA), three subscale scores of MBI-SS [Exhaustion (EX), Cynicism (CY), reduced Professional Efficiency (rPE)] and three subscale scores of UWES-S [Vigor (VI), Dedication (DE), Absorption (AB)] were used as the criterion and predictor variables respectively. The full model across three functions yielded by CCA was statistically significant ($p < 0.001$), explaining 64.7% of the variance between the variable sets. The dimension reduction analysis considered the first two functions accounted for 52.9% and 22.7% of shared variance respectively. In Function 1, EX was the most relevant criterion variable contributing to burnout [structure coefficient (rs) = 0.998], while all three variables were positively related. Furthermore, VI (rs = −0.959) and AB (rs = −0.899) variables were the primary contributors to work engagement. The canonical correlation between the burnout and work engagement variables was found to be high (0.727). This complex, strong relationship between burnout and work engagement among students provides a platform to develop evidence-informed policies focusing on student engagement as a means of promoting mental well-being of students.

Introduction

In the context of increasing complexity and competitiveness in diverse educational environments, the mental health problems among different student populations across the globe are on the rise. Global evidence suggests that burnout is an important emerging health issue amongst the wide range of mental health problems affecting school and college students (Walburg, 2014).

Research on student burnout gained momentum following the introduction of the Maslach Burnout Inventory-Student Survey (MBI-SS) (Schaufeli, Martinez, et al., 2002a). Schaufeli, Martinez, et al. (2002a) during their pioneering research in introducing MBI-SS have defined student burnout as, "a three-dimensional syndrome that is characterised by feelings of exhaustion due to the demands of studying, a cynical attitude of withdrawal and detachment, and reduced professional efficacy regarding academic requirements". Though various study instruments have been used to assess burnout among student populations, MBI-SS is the most widely used research instrument to assess burnout in global literature (Campos et al., 2013; Csikszentmihalyi & Seligman, 2000; Gil-Monte, 2005; Marôco & Campos, 2012; Wickramasinghe et al., 2018a).

Amongst the different student populations in the globe, wealth of research concerning student burnout has been conducted among university undergraduates and in them; the prime target population under concern has been medical undergraduates. (Frajerman et al., 2019; Hu & Schaufeli, 2009; IsHak et al., 2013). In comparison to the plethora of research conducted among university undergraduates, the studies conducted among high school students are scanty. Even amongst them, the magnitude of the problem had been quantified in terms of prevalence only in a very limited number. The reported prevalence of

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student burnout reflects a substantial variation, mainly owing to the inherent differences across educational settings and difference sin assessment tools and criteria.

While the global evidence suggests that the prevalence of burnout among Finnish schooling adolescents is approximately 10% to 15% (Salmela-Aro et al., 2008; Virtanen et al., 2014) and 13% among Chinese middle school students (Zhang et al., 2013), the prevalence estimates of student burnout reported in the South Asian countries reveal higher burden of the problem with prevalence of 21% for emotional exhaustion, a prevalence of 29% for depersonalization and a prevalence of 54% for personal accomplishment among Indian postgraduate dental students (Shetty et al., 2015) and 28.8% among Sri Lankan collegiate cycle students (Wickramasinghe et al., 2018c).

Burnout, which is considered as erosion into the psychological well-being in working environment, is shown to lead to pernicious influences on physical, mental and social wellbeing. Evidence suggests that poor academic performances and examination failures, which are associated with burnout, lead to truancy and ultimately school dropout (Bask & Salmela-Aro, 2013; Kutsal & Bilge, 2012). Further, burnout is associated with poor interpersonal relationships and undesirable behaviours such as substance abuse (Kutsal & Bilge, 2012), depressive symptoms (Salmela-Aro et al., 2009), somatic symptoms (Murberg & Bru, 2003) and even future suicidal ideation among students (Dyrbye et al., 2008; Galán et al., 2014).

In parallel with the wealth of research on burnout, there is an emerging trend towards research focusing on its positive antipode, viz. work engagement (Schaufeli & Bakker, 2003). Work engagement is defined as, "a positive, fulfilling, work-related state of mind that is characterised by vigor, dedication and absorption. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual or behaviour" (Çapri et al., 2017). In the global literature, the Utrecht Work Engagement Scale-Student Version (UWES-S) is identified as the most commonly used instrument to assess student work engagement (Bilge et al., 2014; Çapri et al., 2017; Cazan, 2015; Gómez et al., 2015; Salmela-Aro & Read, 2017; Schaufeli, Martinez, et al., 2002a).

Studies conducted among school students in different settings have shown a negative correlation between burnout and engagement (Salmela-Aro & Upadaya, 2012; Salmela-Aro & Upadyaya, 2014; Schaufeli, Salanova, et al., 2002b). However, most of the studies assessing the relationship have not used multivariate statistical techniques, which would have allowed exploring the detailed complex relationships between the different dimensions of burnout and engagement. Since global evidence suggests that students' engagement is

positively linked with their academic performances and positive academic outcomes (Furrer & Skinner, 2003; Heffner & Antaramian, 2016; Janosz et al., 2008; Li & Lerner, 2011; Skinner et al., 1998; Ugwu et al., 2013), educators and policymakers are increasingly focusing on student engagement as a means of addressing problems of negative academic outcomes of varying student groups (Appleton et al., 2008).

The above-mentioned focus on positive psychological concept of engagement is with great significance in promoting mental health and well-being of student populations. The broaden-and-build theory describes that the positive emotions not only broaden an individual's momentary thought-action repertoire, but also, the consequences of these broadened mind sets in turn build personal resources such as physical, intellectual, social and psychological resources. Moreover, these improved resource pool would ultimately lead to optimizing health and well-being (Fredrickson, 2004). Further, it is highlighted that the positive psychology promises to improve quality of life (Seligman & Csikszentmihalyi, 2014). According to the broaden-and-build theory, both positive and negative emotions co-exist, while positive emotions build resources to cope with negative emotions. Hence, as per the theory, positive psychology is complementary to the study of negative emotions and how to fix them, which highlights the importance of assessing the positive emotions of engagement in parallel with negative emotions of burnout.

In this given context, it is imperative to explore the complex relationship between burnout and work engagement in order to formulate strategies and policies in mental health promotion targeted at this population. Despite the fact that numerous studies have explored the association between student burnout and engagement, most of the studies have not adequately explained the complex relationship between these concepts and the evidence related to different student populations in the South Asian countries are lacking. There is limited published literature in relation to student burnout (Wickramasinghe et al., 2018a, b, c) and work engagement (Wickramasinghe et al., 2018d) in the Sri Lankan context as well. In this background of research vacuum, the present study was designed to assess the complex relationship between burnout and work engagement among collegiate cycle students in Sri Lanka. The findings on the complex relationship between burnout and work engagement among students would facilitate educators and policy makers in formulating packages for preventing burnout as well as promoting mental well-being among students.

Methods

Study Design and Setting

In Sri Lanka, the collegiate cycle in the education system (consists of grade 12 and grade 13) leads to the General

Certificate of Examination Advanced Level, which is the national level selection examination for state university admissions. Collegiate cycle consists of four main subject streams, viz., Science, Arts, Commerce and Technology. This school-based cross-sectional study was conducted in a selected educational zone in the Kegalle district, Sabaragamuwa Province, Sri Lanka.

Participants

The study population consisted of all grade thirteen students studying in Sinhala medium government schools in the educational zone at the time of the study. The study participants included 872 grade thirteen students studying in selected 15 schools representing all four main subject streams.

A total of 796 students completed the questionnaires; hence, the response rate was 91.3%. The mean age of the grade thirteen students in the sample was 18.4 years (SD = 0.32 years). The majority of the participants were females ($n = 440$, 55.3%) and Buddhists ($n = 774$, 97.2%). Approximately, one third of students ($n = 276$, 34.7%) were studying in the Arts subject stream, while 29.5% ($n = 235$) and 28.8% ($n = 229$) of students were studying in Science and Commerce subject streams respectively.

Measures

Maslach Burnout Inventory-Student Survey (MBI-SS)

The validated and culturally adapted Sinhala version of the 15-item MBI-SS was used to assess student burnout. It consisted of five, four and six items targeted at identifying exhaustion (EX), cynicism (CY) and reduced professional efficiency (rPE) subscales respectively. In the MBI-SS, a seven-point, fully anchored response format ranging from 0 (never) to 6 (every day) was used to assess the frequency in which the respondents experience feelings related to each subscale.

The Sinhala version of the 15-item MBI-SS was found to be a valid and a reliable instrument to assess burnout among collegiate cycle students in Sri Lanka (Wickramasinghe et al., 2018a). The 15-item three-factor model emerged as an acceptable fitting model with a combination of absolute, relative and parsimony fit indices reaching desired threshold values in the confirmatory factor analysis. In addition, the 15-item MBI-SS showed high internal consistency, with Cronbach's α coefficient values of 0.837, 0.869 and 0.881 for EX, CY and rPE subscales respectively, and high test-retest reliability ($p < 0.001$) (Wickramasinghe et al., 2018a). In addition, the 15-item MBI-SS showed high internal consistency in the present study with a Cronbach's α coefficient of 0.807.

Utrecht Work Engagement Scale-Student Version (UWES-S)

The Sinhala version of the 16-item UWES-S, which consists of five, five and six items assessing vigor (VI), dedication (DE) and absorption (AB) subscales respectively, was used to assess work engagement. The construct validity of the Sinhala version of the 16-item UWES-S was appraised by using multi-trait scaling analysis and exploratory factor analysis (EFA). The EFA using principal component analysis with Oblimin rotation suggested a three-factor solution explaining 65.4% of the total variance for the 16-item UWES-S. All three subscales showed high internal consistency with Cronbach's α coefficient values of 0.867, 0.819 and 0.903 and the test-retest reliability was high ($p < 0.001$) (Wickramasinghe et al., 2018d). In addition, the 16-item UWES-S showed high internal consistency in the present study with a Cronbach's α coefficient of 0.810.

Procedure

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka (Reference no: ERC/2014/057). Administrative clearance was obtained from the Zonal Director of Education and the principals of all the selected schools prior to data collection. Informed written consent was obtained from all the study participants. Confidentiality of data collected was adhered to strictly and the anonymity of the participants was maintained.

Data Analysis

Data analysis was done by using the SPSS version 25.0. After entering, double independent check of entries was carried out to screen for normality of the data distribution and missing scores. Descriptive statistics for the scores of EX, CY and rPE subscales of the MBI-SS and VI, DE and AB subscales of the UWES-S were generated. The bivariate correlations among all the subscale scores were computed. The canonical correlation analysis (CCA) was conducted to explore and quantify the strength of the multivariate relationship between burnout and work engagement. In the CCA, the three subscale scores of MBI-SS were used as the observed criterion variables, whereas, the three subscale scores of UWES-S were used as the observed predictor variables. Accordingly, burnout was considered as the synthetic criterion variable and work engagement was considered as the synthetic predictor variable. Given that the present study explored six variables in a dataset involving 796 study participants, the analysis fulfilled the sample size related guideline of a minimum of 10 observations per variable (Hair et al., 1998).

Results

Descriptive Statistics of the Variables Included in the CCA

Sample data fulfilled the assumptions required for CCA such as large sample size, multivariate normality, absence of outliers, no singularities and linearity.

Descriptive statistics and bivariate correlations of the EX, CY and rPE variables of burnout and VI, DE and AB variables of work engagement are summarised in Table 1. Bivariate correlation revealed that all three variables of burnout had statistically significant correlations with all variables of work engagement at *p* value less than 0.01.

CCA

The CCA conducted to evaluate the multivariate shared relationship between the two variable sets, viz., burnout and work engagement among a sample of grade thirteen students yielded three functions with squared canonical correlations of 0.529, 0.227 and 0.032 for each successive function. Collectively, the full model across all functions was statistically significant (Wilks's $\lambda = 0.353$, $F(9,1922.80) = 114.176$, $p < 0.001$). Since Wilks's λ represents the variance unexplained by the model, $(1–\lambda)$ yields the full model effect size in an r^2 metric. Thus, for the set of three canonical functions, the r^2 type effect size was 0.647, which indicates that the full model explained a substantial portion (64.7%) of the variance shared between the variable sets.

The dimension reduction analysis revealed that similar to Function 1, both Function 2 and 3 were also statistically significant with $F(4,1582.00) = 61.559$, $p < 0.001$ and $F(1,792.00) = 25.780$, $p < 0.001$ respectively. However, given the effects for each function, only the first two functions were considered noteworthy in the context of this study, which account for 52.9% and 22.7% of shared variance respectively.

Function 3 only explained 3.2% of the remaining variance in the variable sets after the extraction of the prior functions.

Table 2 presents the standardized canonical function coefficients and r_s for Functions 1 and 2. The r_s^2 are also given as well as the communalities (h^2) across the two Functions for each variable.

Function 1 coefficients reveal that, EX is the most relevant criterion variable contributing to the synthetic criterion variable; burnout. This evidence is substantiated by very high values of r_s and r_s^2. On the other hand, CY variable had a small function coefficient, but a large r_s. Even though rPE had small function coefficient and r_s values, all these three variables' r_s values had the same sign, indicating that they were all positively related. Regarding the predictor variable set in Function 1, VI and AB variables were the primary contributors to the predictor synthetic variable; work engagement, with a small contribution by DE. Nonetheless, all these three variables' r_s values had the same sign.

In relation to Function 2, the CY variable in the criterion variables and AB variable in the predictor variables had the highest r_s values. EX and CY and among criterion variables, and VI and AB among predictor variables had very high h^2 values in the overall CCA.

In Function 1, 49.5% of the variance in the burnout synthetic criterion variable was explained by EX, CY and rPE observed criterion variable set, whereas, 26.2% of the variance was explained by the VI, DE and AB observed predictor variable set. On the other hand, 71.0% of the variance in the work engagement synthetic predictor variable was explained by the predictor variable set, while 37.6% of the variance was explained by the criterion variable set.

Figure 1 illustrates the summary findings of the Function 1 in CCA with the multivariate relationships of the three predictor and three criterion variables, and burnout and work engagement synthetic variables.

Discussion

The present study was designed with the objective of assessing the complex relationship between burnout and work engagement among collegiate cycle students in Sri Lanka. Hence, a cross sectional design was used to achieve this objective. Given that both burnout and engagement among students demonstrate heterogeneity across different educational contexts, only grade thirteen students in a selected educational zone were selected to minimise the heterogeneity in relation to their academic endeavours.

To elucidate the relationship between burnout and work engagement, CCA was used in the study. This multivariate technique provided the opportunity to explore the complexity of multiple relationships of constructs under investigation (Hardoon et al., 2004; Sherry & Henson, 2005;

Table 1 Descriptive statistics and bivariate correlations of the variables included in the canonical correlation analysis ($n = 796$)

Variable	Mean	SD	EX	CY	rPE	VI	DE	AB
EX	11.98	7.16	–					
CY	6.80	5.98	0.615	–				
rPE	10.56	6.46	0.279	0.374	–			
VI	17.97	6.78	−0.699	−0.391	−0.128	–		
DE	17.84	5.19	−0.475	−0.195	−0.218	0.516	–	
AB	23.29	7.25	−0.642	−0.577	−0.206	0.758	0.530	–

EX = Exhaustion; CY = Cynicism; rPE = reduced Professional Efficiency; VI = Vigor; DE = Dedication; AB = Absorption

Table 2 Canonical solutions for burnout and work engagement for Functions 1 and 2

Variable	Function 1			Function 2			
	Coef:	r_s	r_s^2 (%)	Coef:	r_s	r_s^2 (%)	h^2 (%)
EX	0.961	**0.998**	99.60	−0.814	−0.059	0.34	**99.94**
CY	0.082	**0.655**	42.90	1.307	**0.740**	54.76	**97.66**
rPE	−0.050	0.249	6.20	−0.176	0.086	7.39	13.59
VI	−0.621	**−0.959**	91.97	0.957	0.170	2.89	**94.86**
DE	−0.121	**−0.635**	40.32	0.647	0.358	12.82	**53.14**
AB	−0.364	**−0.899**	80.82	−1.478	−0.410	16.81	**97.63**
Canonical correlation		0.727	52.85		0.476	22.66	

Coef: = standardized canonical function coefficient; r_s = structure coefficient; r_s^2 = squared structure coefficient; h^2 = communality coefficient. Structure coefficients (r_s) greater than |0.450| and communality coefficients (h^2) greater than 45% are given in bold text.

EX = Exhaustion; CY = Cynicism; rPE = reduced Professional Efficiency.

VI = Vigor; DE = Dedication; AB = Absorption

Wickramasinghe, 2019). Guidelines on statistical techniques to be used in complex human behaviour research highlights the importance of using techniques that could investigate variables that possibly have multiple complex relationships, rather than separately examining singular relationship (Sherry & Henson, 2005). Thus, using CCA is a main strength in this particular study rather than merely using bivariate analysis. Furthermore, the sample size of the study deemed adequate to conduct the multivariate analysis (Hair et al., 1998).

To assess burnout and work engagement, widely used, culturally adapted and validated study instruments have been used in this study. Evidence suggests that the MBI-SS is the most widely used research instrument to assess burnout in different student populations across the globe (Campos et al., 2013; Csikszentmihalyi & Seligman, 2000; Gil-Monte, 2005; Marôco & Campos, 2012; Wickramasinghe et al., 2018a), while UWES-S has been widely used to assess engagement among different student populations (Bilge et al., 2014; Çapri et al., 2017; Cazan, 2015; Gómez et al., 2015; Salmela-Aro & Read, 2017; Schaufeli, Martinez, et al., 2002a). Moreover, the Sinhala versions of the MBI-SS (Wickramasinghe et al., 2018a, b) and UWES-S (Wickramasinghe et al., 2018d) have been culturally adapted and validated in the local setting.

In the present study, bivariate correlation revealed that all three variables of burnout had statistically significant correlations with all variables of work engagement. This finding is in line with previous studies, which have highlighted negative correlation between burnout and engagement among different student populations (Salmela-Aro & Upadaya, 2012; Salmela-Aro & Upadyaya, 2014; Schaufeli, Salanova, et al., 2002b). Specifically, a cross national study conducted using Spanish, Portuguese and Dutch versions of the MBI-SS and the UWES-S had revealed significant negative correlations between the three subscales of burnout and three subscales of engagement (Schaufeli, Martinez, et al., 2002a). Furthermore, similar significant negative correlations were observed between the three subscales of burnout and three subscales of engagement in a sample of Turkish high school students (Kutsal & Bilge, 2012). Given that EX and CY subscales of burnout are considered as direct counterparts of VI and DE subscales of work engagement respectively (Leiter & Maslach, 2017), significant negative correlations were anticipated between respective subscales. Thus, the present study findings are in line with the underpinning theoretical constructs.

In this study, the complex relationship between the subscales of burnout and work engagement has been described

Fig. 1 Relationship between the set of work engagement variables and the set of burnout variables based on canonical correlation analysis Function 1
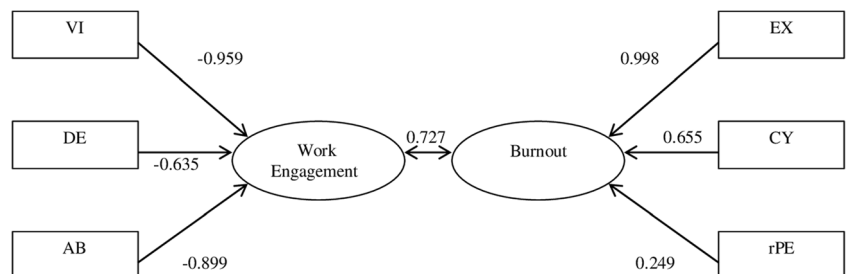
instead of merely considering the entirety of burnout and work engagement. The analysis revealed that in addition to the statistically significant correlation between burnout syndrome work engagement, EX and VI subscales contributed the most towards the explanatory capacity of canonical variables estimated from the subscales of burnout work engagement respectively.

According to the original definition, EX is defined as feelings of strain, particularly chronic fatigue resulting from overtaxing work (Schaufeli, Martinez, et al., 2002a). Evidence suggests that EX indeed is the most important subscale of the burnout and with a view of reflecting the multidimensional nature of burnout without formulating a composite score, the "exhaustion+1" criterion is recommended for research (Brenninkmeijer & VanYperen, 2003; Roelofs et al., 2005). With regard to work engagements, VI is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work and persistence even in the face of difficulties (Çapri et al., 2017) and accordingly, VI has emerged as the primary contributor to the work engagement in this present study. Furthermore, these findings are in line with the theory suggesting that EX and CY are to be considered as the core components of burnout (Green et al., 1991; Langelaan et al., 2006), while VI and DE are considered as the core dimensions of work engagement (Langelaan et al., 2006; Schaufeli & Bakker, 2004).

In CCA, the standardised canonical coefficients indicate the effect of work engagement on the burnout of the collegiate cycle students. Accordingly, as work engagement increases, burnout subscales decrease. Since subscales with larger canonical loadings contributed significantly more to the multivariate relationship between burnout and work engagement, the results also suggests that VI is the primary determinant of student burnout.

Even though the combined subscales of VI, DE and AB successfully explained work engagement of 71.0% of students, the combined subscales of EX, CY and rPE successfully explained burnout of 49.5% of students. Furthermore, the canonical correlation between the burnout and work engagement variables was found to be high with a value of 0.727. Hence, the multivariate analysis highlighted the importance of exploring the complexity of the relationship between burnout and work engagement among students.

The ultimate objective of student burnout research is to improve the mental well-being of the affected student populations by developing preventive packages of intervention. Hence, further research targeted at identifying complex burnout and work engagement characteristic profiles involving diverse student populations are needed. Future qualitative research and mixed-method research approaches would be of great benefit in exploring the details of work engagement characteristic profiles of students.

The complex, yet, strong negative relationship between burnout and work engagement revealed by the present study has some implications to different stakeholders in the school community such as students, educators and policy makers. Since work engagement reflects positive psychology of the student populations, these characteristics could be incorporated in formulating packages for preventing burnout as well as promoting mental well-being among students.

As highlighted, according to the broaden-and-build theory, the positive emotions leading to building personal resources such as physical, intellectual, social and psychological resources would result in optimizing health and well-being (Fredrickson, 2004) and improving quality of life (Seligman & Csikszentmihalyi, 2014). Further, the broaden-and-build theory suggests that positive emotions undo lingering negative emotions, fuel psychological resiliency, trigger upward spirals toward improved emotional well-being and positive emotions are considered as vehicles for individual growth and social connection (Fredrickson, 2001). In this context, with regard to present study findings, it is of great importance to develop strategies to promote the positive emotions of engagement among students in order to undo lingering the negative emotions associated with burnout.

Hence, it is recommended that school-level activities to focus on empowering students to assess their psychological well-being such as the use self-applied work engagement scales to identify their level of engagement. Furthermore, it is recommended to strengthen the supportive services such as school counselling services in order to facilitate such activities. In addition, it is important to create a stimulating and student-friendly psychosocial environment in the school premises with a view of promoting positive psychological constructs such as engagement.

One of the limitations of the present study is the inability to establish the temporal relationship between burnout and engagement due to the cross-sectional nature. Further, generalisation of the study findings to other study settings should be done with caution, considering the educational and cultural differences across different student populations.

Conclusions

The findings of the present study clearly demonstrate that there is a complex, yet, a strong relationship between burnout and work engagement among collegiate cycle students. The evidence generated from this study offer a platform for the educators and policymakers to develop evidence-informed policies focusing on student engagement as a means of promoting mental well-being of students.

Declarations

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