

Nature Connectedness: An Investigation into Alleviating Emotional Disturbances among University Students

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ABSTRACT

Emotional disturbances among undergraduate students have proven to affect students' learning performance physically, emotionally and mentally. Among non-clinical treatments or techniques identified to address emotional disturbances is exposure to nature. This study investigates the impact of nature connectedness on emotional disturbances among 390 undergraduate students from various disciplines at one of Malaysia's largest public universities. The research explores causal relationships and mediating effects among nature connectedness, restorativeness, spiritual values, and emotional disturbances, specifically stress, anxiety, and depression. The findings reveal significant associations between nature connectedness and restorativeness, as well as between nature connectedness and spiritual values. Notably, restorativeness emerges as a mediator between nature connectedness and stress, while spiritual values act as a mediator between nature connectedness and depression. The study underscores the potential of combining nature exposure and spirituality as a means of fostering psychological and emotional recovery. It is important to note that the generalizability of these findings is limited to the specific university sample in Malaysia. Nonetheless, the results contribute valuable insights into non-clinical interventions for addressing emotional challenges among undergraduate students.

Keywords: Nature connectedness, restorativeness; spiritual value; stress, depression; anxiety.

INTRODUCTION

Patterns and levels of emotional disturbance among undergraduate students, have significantly increased not only globally but also in Malaysia (Mishra et al., 2023; Zafirah et al., 2016). A study by World Health Organization (WHO, 2018) revealed that mental health disorders are expected to increase by 15 percent by year 2020, with youths being among the high risk groups. In Malaysia, a report by the Malaysian Healthcare Performance Unit (2016) stated that the prevalence of mental health problems in adults and children were 29.2% and 12.1% respectively. The study also found that among the 25,507 respondents of Malaysian 13-17 years old, the percentage of those with suicidal ideation is 7.9%, suicidal plan, 6.4%, suicidal attempts, 6.8%, depression, 17.7%, anxiety, 39.5%, and stress, 10.1% (Unit, 2017).

Other studies have expressed concerns that psychological needs of undergraduate students who undergo emotional disturbances have not received due attention (Down & Eisenbery, 2012). Another study on the psychological well-being of 192 post graduate students in Malaysian university found that in general the dimensions studied which include personal growth, purpose in life, positive relations with others, self-acceptance, environmental mastery and autonomy were relatively high (Yusli, 2021). However, it is interesting to note that the two dimensions that scored lower than the rest are environmental mastery and

autonomy, which might indicate that the incongruency between one’s own judgement and others could still be affecting the psychological well-being of students at post graduate level.

Past studies have reported that emotional disturbances result in physiological effects (Franken, 1994) such as mental fatigue (Nisbet et al., 2011), issues of focus and attention (Kaplan & Kaplan, 1989), cognitive constraints, anger or aggression (Park et al., 2011). Evidences revealed that emotional disturbances negatively impact students’ academic performance related to poor class attendance and reduced concentration during learning sessions (Bowman, 2010). In order to address the aforementioned problems, an effective learning attitude using a person-centred approach is required. Past research findings proposed the need to create a conducive learning environment area as a psychological recovery tool for the positive development of individual cognition, emotion and behaviour (Hartig et al., 2001).

One such recommendation highlights the benefits of nature or a green environment as a psychological aid to build self-esteem towards reducing stress (Hartig & Staats, 2006; Kaplan & Kaplan, 1989). Recent findings also reveal the fact that exposure to nature is least preferred by individuals as a form of restorative activity compared to other forms of social activities (Roslan, et al., 2017). This is contrary to the findings of empirical studies that emphasized the use of natural environment for the purpose of health improvement (Annerstedt & Wahrborg, 2011). In urban areas, individuals spend substantial amount of time indoor such as home, schools and universities compared to time spent outdoor in contact with nature (Maller et al., 2002). Residents in urban areas have minimal options of natural or green areas for restorative purposes. This situation is believed to have manifested into the Nature-Deficit Disorder phenomenon which sees individuals as being less connected with nature (Louv, 2008). In contrast, the biophilia hypothesis emphasizes the natural tendencies humans possess to establish connection with all living organisms that provide therapeutic benefits to human health (Kellert & Wilson, 1995). In this regard, the trend of urbanization has been shown to negatively influence the emotional relationship of people with nature, a fact which could lead to a separation gap between people and nature which has the potential to lead to mental health problems (Roszak, 1992).

The current theoretical hypotheses related to nature’s bearing on people’s psychological and health well-being are attested by the Attention Restoration Theory (ART) (Kaplan & Kaplan, 1989) and Stress Recover Theory (SRT) (Ulrich, 1991). However, in specific cases concerning the relationship between nature and emotional disturbances independent references are often made to nature connectedness and spiritual values that constitute the Ecopsychology Theory (Roszak et al., 1995; Roszak, 1992). In order to evaluate the relationship between all variables concerned, the current study combines all three theories, which are the Attention Restoration Theory (Kaplan & Kaplan, 1989); the Stress Recover Theory (Ulrich, 1991); and Ecopsychology Theory (Roszak, 1992) Using a proposed model as Figure 1, the current study was carried out to validate the causal relationship between nature connectedness, restorativeness and spiritual values in managing emotional disturbances which include individual stress, anxiety and depression; and the roles these variables play towards improving psychological well-being (Marselle et al., 2016; Kamitis & Francis, 2013).

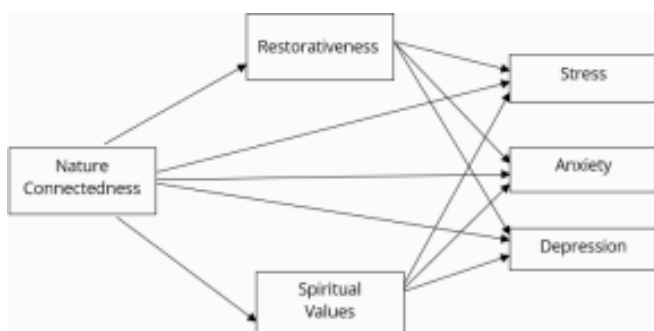


Figure 1. Proposed Conceptual Framework of the study

Nature Connectedness, Restorativeness and Spiritual Values

Past studies have mainly focused on the relationship between human health and nature (Frumkin et al., 2017; Sandifer et al., 2015). Nature or the surrounding presence of green spaces such as parks or forests are known to offer numerous psychological, health and social benefits. Among the most common benefits are recovery from mental fatigue (White et al., 2013; Berman et al., 2012; Hartig et al., 2003), stress reduction (Ward Thompson et al., 2016), enhancement of the social relationship of neighbourliness (Maas et al., 2009), reduction in crime, violence and aggression (Kuo & Sullivan; 2001), and reduction in mortality rate for certain categories of illness (Kuo, 2015; De Vries et al., 2003).

There have also been studies that demonstrated how environmental factors play a key role in influencing the well-being of human emotions, psychological systems and health status (Ulrich, 1999). Tigerwell et al., (2014) and Kamitis and Francis (2013) revealed that spiritual elements serve as a mediator in the relationship between nature and psychological well-being. This pattern supports previous studies which demonstrated that spiritual value is a predictive factor of good health and well-being (Forbes, 2010). There is a significant relationship between spiritual values and mental health which sees high levels of spiritual affinity closely linked to sound mental health, especially among adolescents and youth (Wong, Rew & Slaikou, 2006).

There was also a study that found that green areas in university environments had significant impact on the restorative efforts and quality of life among students in three universities in the United States (Hipp et al., 2016). Marselle et al. (2016) also hypothesized that restorativeness could potentially be a mediator between natural perceptions, biodiversity and intensive running activity in green environments which could result in positive emotional well-being of human beings. Similarly, Carrus et al., (2015), examined the potential of restoration as a mediator between biodiversity and wellbeing. Green environment is seen as an important tool for restoration that is achieved through a strong emotional connection to nature and emotional well-being, especially towards reducing emotional disturbances. Hence, the objectives of the present study are as follows:

To identify the causal effects of nature connectedness, restorativeness and spiritual values on emotional disturbances from three dimensions, namely stress, anxiety, and depression; Thus, the following hypothesis is development

Ha1 There is significant relationship between nature connectedness and emotional disturbance (stress, anxiety and depression)

Ha2 There is significant relationship between nature connectedness and restorativeness

Ha3 There is significant relationship between nature connectedness and spiritual values

Ha4 There is significant relationship between restorativeness and emotional disturbance (stress, anxiety and depression)

Ha5 There is significant relationship spiritual values and emotional disturbance (stress, anxiety and depression)

To determine the mediating effects of restorativeness and spiritual values on the relationship between nature connectedness and emotional disturbances (stress, anxiety and depression) among undergraduate students

Ha6 Restorativeness is the mediator between nature connectedness and emotional disturbance (stress, anxiety and depression)

Ha7 Spiritual values is the mediator between nature connectedness and emotional disturbance (stress, anxiety and depression)

MATERIAL AND METHODS

Participants and Procedures

This current study used a quantitative research design, which included correlation tests, path analyses and mediation tests. To fulfill the criteria to employ SEM-AMOS, this study, required a total of 390 undergraduate students using GPower saiz sampling (Faul et al., 2007) . Next, all the participants were selected randomly by using the Random Number Generator (RNG) System from 16 faculties which include Faculty of Language and Communication; Faculty of Management and Business; Faculty of Educational Studies; Faculty of Science; Faculty of Medicine; Faculty of Computer Science and Technology; Faculty of Engineering etc. Of the total participants, 84 were female students (21.5%) and 306 were male students (78.5%). Majority of the students were Malay (n=302; 77.4%), followed by Chinese (n=54; 13.8%), Indians (n=12, 3.1%), and 5.6% of the students were reported be of other races (n=22).

Instruments

The questionnaire consisted of five parts: Part A had four items to assess the demographic profile of the respondents; Part B provided nature connectedness scale; Part C perceived restorativeness scale to measure individual perception of the environment; Part D related to spiritual values and finally Part E, for the purposed of measuring individual emotional disturbances in three dimensions namely, (1) stress; (2) anxiety; and (3) depression.

Nature Connectedness

St John and MacDonald (2007) to gauge individual levels of nature connectedness, serves as a vital tool in measuring the intricate relationship between individuals and the natural environment. Utilized 13 items, focusing on two fundamental concepts within nature connectedness: (1) the spiritual elements of a person based on the natural environment and (2) the relationship between humans and nature. Employing a 7-point Likert scale, where respondents express their agreement on a scale from (1) strongly disagree to (7) strongly agree, this instrument demonstrates high internal consistency, as indicated by a Cronbach's alpha coefficient of $\alpha = 0.920$.

Perceived Restorativeness Scale (PRS)

The Perceived Restorativeness Scale (PRS) (Hartig et al., 1997) and was applied to measure individual perception of the environment. The construction of the items in this instrument was based on the Attention Restoration Theory (ART) and consists of 21 items to measure the quality of restoration in question (Kaplan & Kaplan, 1989). Restorativeness was measured based on four aspects: (1) being away; (2) fascination; (3) coherence; and (4) compatibility. In this study, all four aspects are based on the ART theory which suggests that recovery is strongly influenced by the environment (Bagot, Kuo & Allen, 2007). Measurements of the items in question were tested using a 7-point Likert scale, with a score which range from (0) Not at all to (6) Completely. The results of reliability tests from previous studies were within the accepted range as indicated by Cronbach alpha of $a = 0.927$.

Spiritual Values

The Spiritual Value Instrument, a collaborative creation by Universiti Putra Malaysia (UPM) in partnership with Cyberjaya University College of Medical Sciences (Muda et al., 2011), is a meticulously designed tool to assess spiritual values in the Malaysian context. This instrument consists of 9 items, each measured on a comprehensive 7-point Likert scale, where respondents rate their agreement on a spectrum from (1) strongly disagree to (7) strongly agree. The reliability of the instrument is underscored by a Cronbach's alpha coefficient of $\alpha = 0.869$, indicating a high level of internal consistency.

Depression, Anxiety & Stress Scale (DASS21)

The DASS21, developed by Lovibond and Lovibond (1995), serves as a comprehensive instrument designed to assess individual emotional disturbances across three dimensions: (1) stress, (2) anxiety, and (3) depression. Each dimension comprises 7 items, meticulously crafted to capture nuanced aspects of emotional experiences. Stress measurement involves evaluating negative emotions and tension-inducing stress, while anxiety assesses feelings of fear and physiological stimulation. Depression encompasses a negative mindset, low self-confidence, and uncertainty about the future. Widely utilized internationally, the DASS21 is a self-administered questionnaire employing a 7-point Likert scale, ranging from (0) did not apply to me to (6) applied to me very much, or most of the time for all 21 items. The instrument demonstrates high internal consistency, as indicated by a Cronbach's alpha coefficient of $\alpha = 0.942$, reaffirming its reliability in capturing diverse facets of emotional well-being.

Data Analyses

In this study, the data analysis was conducted using SPSS 22.0 and AMOS 24.0 (Analysis of Moment Structures). Structural Equation Modeling (SEM) was employed for the path analysis, involving the computation of the measurement model, structural model, and mediation tests. The initial step encompassed the development of the measurement model based on outcomes from Pearson correlation tests. Discriminant validity and model fit were then assessed, with the measurement model serving as the foundation. The evaluation of model fit aimed to confirm the acceptability and appropriateness of the proposed model for subsequent hypothesis testing.

In the subsequent step, a structural model was constructed to scrutinize the causal effects of exogenous constructs on endogenous constructs. Finally, the research hypotheses underwent testing through bootstrapping to examine the mediation effects. Descriptive analysis was performed to present the profiles of the respondents. This comprehensive analytical approach utilizing SEM, model fit assessments, and mediation testing ensures a robust examination of the relationships and mediation effects posited in the research hypotheses.

Preliminary analyses

The preliminary results demonstrated the univariate normality of the data (skewness and kurtosis values were in the range -1.273 to 1.647. Byrne (2016), the acceptable range for data normality is met when skewness values fall between -2 and +2, and kurtosis values are within the range of -7 to +7. On the other hand, multicollinearity exercise to ensure correlation between the inter-construct correlation and factor loading and threshold should be below 0.90 (Hair et al., 2010). The inter-correlation between the constructs ranged between 0.197 to 0.716 ($p < 0.001$).

A confirmatory factor analysis (CFA) was then conducted to examine if the construct indicators aptly represent the constructs to be measured in the study. Kline (2005), convergent validity refers to a set of

indicators designed to measure a construct, which can be tested using AVE. A high AVE (> 0.50) indicates a high convergent validity, therefore AVE for each construct should be at least 0.50 (Fornell & Larcker, 1981). The construct reliability and Cronbach alpha should be more than 0.70. Table 2 illustrates that the Cronbach alpha, construct reliability (CR) and Average Variance Extracted (AVE) for each construct and dimension met the analyses requirements (Byrne, 2010; Hair et al., 2010).

Table 2 Cronbach Alpha, Construct Reliability (CR) and Average Variance Extracted (AVE)

Constructs	No of items	Cronbach Alpha	CR	AVE
Emotional Disturbance				
Stress	6	0.859	0.857	0.507
Anxiety	6	0.851	0.850	0.501
Depression	6	0.907	0.910	0.627
Nature Connectedness	13	0.937	0.927	0.502
Restorativeness				
Being Away	4	0.895	0.904	0.703
Fascination	8	0.950	0.949	0.699
Coherence	3	0.883	0.883	0.716
Compatibility	6	0.927	0.927	0.681
Spiritual Values	9	0.875	0.875	0.511

RESULTS

Firstly, this study examines the relationship between nature connectedness, restorativeness, spiritual values and emotional disturbances as shown in the Table 3 below (as per research hypotheses Ha1 – Ha5). The table demonstrates that there is a significant influence of nature connectedness on restorativeness ($\beta = .661$; $p < 0.001$) and spiritual values ($\beta = .671$; $p < 0.001$). In addition, restorativeness also has a significant impact on stress ($\beta = -.169$; $p < 0.05$), while spiritual values are significantly affecting stress ($\beta = -.221$; $p < 0.01$), anxiety ($\beta = -.184$; $p < 0.05$), and depression ($\beta = -.331$; $p < 0.001$). Nature connectedness strongly influenced restorativeness and spiritual values (0.661 and 0.671 respectively). The result demonstrates that the effect of nature connectedness on reducing emotional disturbances among undergraduate is not direct, but instead is channeled through restorativeness and spiritual values as illustrated in Table 3. This means that the inclusion of nature appreciation and environmental values in the curriculum, for example, will only take effect in reducing emotional disturbances if it is accompanied with real experiences of nature healing and restoring a person’s psyche. Adding spiritual experience to the whole context will significantly increase the potency of nature connectedness in reducing emotional disturbances.

Table 3: Causal Relationship of Nature connectedness on Emotional Disturbances

Causal Path	Beta	SE	CR	P
Nature connectedness —>				
Restorativeness	0.661	0.077	10.320	***
Spiritual Values	0.671	0.101	7.971	***
Stress	0.173	0.125	1.721	0.079

Anxiety	0.043	0.154	0.714	0.661
Depression	0.037	0.141	0.595	0.691
Restorativeness — >				
Stress	- 0.169	0.081	-2.220	*
Anxiety	- 0.107	0.101	-1.387	0.165
Depression	- 0.085	0.092	-1.178	0.239
Spiritual Values — >				
Stress	- 0.221	0.104	-2.621	**
Anxiety	- 0.184	0.109	-2.187	*
Depression	- 0.331	0.088	-4.020	***

Note: *p<.05; **p<.01; ***p<.001

Secondly, the research objective to examine the mediating effect of restorativeness and spiritual values on the relationship between nature connectedness and emotional disturbances as per hypotheses Ha6 and Ha7. The current study used an explanatory approach to examine the indirect mediation effects of restorativeness and spiritual values on the relationship between nature connectedness and each dimension of emotional disturbances which are stress, anxiety and depression. This approach used the bootstrapping mediation test to create a re-sampling distribution with repeated replacements (Hayes, 2009) to estimate the standard error, and produce a confidence interval (CI) to validate the effects of mediation. The indirect effect is significant if zero is not within the range of confidence interval (Hayes, 2013). Table 4 demonstrates the results of bootstrapping mediation test for the proposed model.

There was a significant indirect effect of nature connectedness on stress when mediated by restorativeness ($\beta = -0.124$, CI = -0.240, -0.005). However, restorativeness alone was not enough to significantly mediate the effect of nature connectedness on anxiety ($p=0.16$) and depression ($p=0.14$). Interestingly, nature connectedness will be able to significantly reduce depression if mediated by spirituality, indicating that embracing the relationship between human being and nature at an existential level may significantly reduce serious emotional disturbances such as depression ($\beta = -0.227$, CI= -0.453 to -0.054).

Table 4: Bootstrap Results of Mediation Test for Evaluating the Relationship between Nature connectedness and Emotional Disturbances

Mediator	Hypothesized Paths	Beta	P	95% CI Bootstrap BC	
				LB	UB
Restorativeness					
	Nature connectedness — > Stress	- 0.124	*	-0.240	-0.005
	Nature connectedness — > Anxiety	- 0.081	0.16	-0.200	0.034
	Nature connectedness — > Depression	- 0.085	0.14	-0.197	0.031
Spiritual Values					
	Nature connectedness — > Stress	- 0.164	0.06	-0.387	0.013

Nature connectedness — > Anxiety	-0.133	0.09	-0.347	0.024
Nature connectedness — > Depression	-0.227	**	-0.453	-0.058

Note: *p<.05; **p<.01; ***p<.001

DISCUSSION

Firstly, this study examines the relationship between nature connectedness, restorativeness, spiritual values and emotional disturbances. Findings revealed that there was a direct and significant causal relationship between nature connectedness and spiritual values among the undergraduates and that a higher ecological understanding among the students contributed greatly to a higher spiritual level. The results of this study are similar to the ones previously reported which stated that such a connection clearly explained the relationship between nature connectedness and spirituality in a natural environmental setting (Trigwell et al., 2014; Kamitsis & Francis, 2013; Unruh & Hutchinson; 2011). Hence, this emphasizes the roles played by affective, cognitive and experiential skills in facilitating the relationship between human emotions and their inclination towards attachment (Nisbet et al., 2011).

Additionally, this study also highlights that the concept of nature connectedness has demonstrated its marked influence on the restorative experiences of undergraduate students gained from nature. Such observations have necessitated further inquiry into the relevance of nature in enhancing restorativeness in natural environmental settings. Based on the observations, it can be inferred that the higher the ecological understanding of people, the higher the level of restorativeness that they may undergo. Thus, as discovered in previous studies and as established in the current one, nature or green space setting is a very relevant tool that is capable of relieving brain fatigue, restoring capacity of concentration and reducing stress (Van den Berrg et al., 2010; Hartig et al., 2003). According to Kaplan and Kaplan (1989), the attractiveness, distance, connectivity and compatibility that are acquired in nature can enhance ecological and restorative relationships, and this is further substantiated by Ulrich (1991) who claimed that such relationships can be used to reduce negative emotions; especially pressure. Hence, it can be firmly established that the relationship between nature connectedness and spiritual values is very relevant to students who are exposed to negative emotions such as stress during their learning, examination, and communication activities.

Moreover, results of the study revealed that there was no significant direct causal relationship between nature connectedness and the various dimensions of emotional disturbances; a fact which is contrary to results of past studies that had demonstrated significant relationships between nature connectedness and emotional disorders such as stress, anxiety and depression (Chalquist et al., 2009; Mayer et al., 2009). However, the lack of the direct effects as mentioned above may suggests that the present generation, especially youth, is prone to the nature-deficit disorder phenomenon (Louv, 2008) and deeply affected by rapid urbanization (Smil, 2005). Since past studies have found that emotional disturbances, especially stress, can be self-managed through the use of technology, internet and social media, the practice of haphazardly combining work/study time and leisure in the name of multitasking has been rampant among the younger generation. (Xu et al., 2016; Nabila, 2018; Roberts & Foehr, 2008).

Hence, of late there has been a serious lack of quality time spent towards emotional connection to nature because of the popular overriding belief that similar benefits can be derived from the use of modern and sophisticated technology in the name of entertainment and learning (Fisher, 2006). Such a lack of connection to nature is further aggravated by limitations of, or accessibility to natural environments; obsession towards computer and internet usage; and lack of safety measures for those exploring nature for leisure (Jarrell et al, 2013; Brussoni et al, 2012; Roberts & Foehr, 2008; Kellert, 2005; Stigsdotter et al.

(2003). These factors have resulted in the current generation's exposure to a less conducive experience and setting. Therefore, this gap should be mitigated by emphasizing and adopting ecopsychological practices toward ensuring better health and connection to nature in order to eventually improve psychological health and wellbeing (Higley & Milton, 2008).

As highlighted through the results of the study, both mediators proved to have significantly mediated their relationship with nature connectedness to reduce negative emotions such as stress and depression. Findings proved that the generation of youth required more restorativeness in nature in order to ensure they capitalise on nature connectedness to reduce their stressed emotions. As found by Hartig et al., (2001), restoration strategies are methods that are adopted by individuals to reinstate their "psychological resources" to be able to encounter psychological challenges especially to overcome their stress levels.

As indicated in the findings of previous studies, psychological resources can be reinstated by enjoying views of surrounding nature from the comfort of one's home (Benfield et al., 2015), doing vigorous physical activity (Ussher et. al., 2007) and participating in social contexts (Sandstrom & Dunn, 2014). However, the best option would still be spending time directly in nature which could help in cultivating people's mental performance, and indirectly enhancing the connection with nature connectedness to lessen negative emotions such as stress. This was confirmed by the finding of Benfield et al. (2015) who discovered that students with accessible views of nature from their classrooms exhibited more positive feelings and provided more optimistic feedback on their overall learning experiences compared to students with no access to views of nature.

On the other hand, there is also the idea or principle of nature connectedness that confirms that the natural world or earth is part of the cosmos, and that it contributes to the harmony of human relations for better health and well-being (Roszak, 2001; Muda et al., 2011). The so-called digital generation also seem to be more focused on technology and giving less attention to spiritual concerns and nature (Yaakob, 2012). As such, this study offers new insights to those suffering from depression to explore spiritual values in the context of nature connectedness which could reduce the negative emotions that they are experiencing. Exposure to spiritual values and nature is believed to be able to contribute to reduced emotional disturbances, especially depression; a fact which fulfils the basic needs and requirements of a human being (Unruh & Hutchinson, 2011).

Thus, by highlighting on the functions of these psychological constructs, this study has attempted at developing better interventions which involve nature and nature connectedness as a means to address emotional disturbances and mental health issues. Chalquist (2009), proposed the practice of "ecotherapy", a method which places emphasis on physical, mental and spiritual experiences by bringing in external activities to create a positive relationship between nature and psychological well-being of humans. The concept of nature connectedness, therefore, should be emphasized and applied on a deeper level toward promoting psychological well-being of the current generation (Buzzell & Chalquist, 2009; Baillie, 2003; Fox, 2000).

For the causal relationship between restorativeness and emotional disturbances, the results demonstrated that there was a significant causal relationship between restorativeness and stress. The findings of this study were in agreement with previous studies which affirmed that restorative experiences in nature could reduce emotional stress (Beyer et al., 2014; Pasini et al., 2014; Hartig et al., 2003; Hartig et al., 1991). The current study demonstrated that a higher level of natural restorativeness contributed to a lower level of stress and vice versa. Restorativeness is believed to possess therapeutic elements that can help reduce negative feelings in students who face enormous stress in their lives. This acts as a source of psychological aid to improve their concentration (Kaplan & Kaplan, 1989).

Existing literature on the subject has an extensive amount of evidence on the potential benefits that nature

possesses towards improving students' psychological well-being (McMahan & Estes; 2015). Self-restoration amidst nature gives one the experience of being relaxed, calm and free-minded after a day of negative and chaotic emotions (Kaplan, 1990; Kaplan & Kaplan, 1989). Additionally, nature has created a rehabilitation process within itself that has the innate power to heal people from emotional disturbances, particularly work, study or personal pressure (Ward Thompson et al., 2016; Berto, 2014; Park et al., 2011; van den Berg et al., 2010; Mayer et al., 2009). For individuals with anxiety problems, treatments or other therapies may be required. This is because negative emotional anxiety is a mental conflict that comprises phobia, neurotic disorders of fear, dodging of motivation, and excessive emotional feelings which are transferred to a physiological form (Henig, 2009). Emotional depression occurs due to unstable thought processes that result from non-functioning beliefs (Boury et al., 2004) which could use the therapeutic potential of mindfulness-based group intervention (Josefsson, Lindwall & Broberg, 2014), wellness therapy (Fava et al., 2017) and behavioral cognitive therapy (Kraaij et al., 2010) as possible solutions.

The current study reported that there was a significant causal relationship between spiritual values and stress, anxiety and depression. This demonstrates that spiritual values help to reduce emotional disturbances. The results of this study are consistent with the results of previous studies in which components in the spirituality and religious aspects have proven to reduce emotional disturbances and improve psychological wellbeing (Yadav et al., 2017; Nadeem et al., 2017; Mouthinho et al., 2017; Taheri-Kharamah et al., 2016; Yahaya et al., 2012; Wachholtz & Rogoff, 2013; Kim & Seidlitz, 2002). This study also complements the findings of a study conducted by McCauley et al., (2008) and West (2004) which demonstrated a significant relationship between the awareness of spiritual value and health, which were recognised as self-healing tools. However, it must be mentioned at this juncture that spiritual value has since been identified and recommended as a better preventative treatment technique (Taheri-Kharamah et al., 2016).

Secondly, the research objective to examine the mediating effect of restorativeness and spiritual values on the relationship between nature connectedness and emotional disturbances. The effects of restorative mediators on nature connectedness relationships with stress was observed because the quality of restorativeness that was obtained from the exposure to nature, such as distance, attractiveness, interconnectivity and harmony in nature were capable of reducing the negative emotions that resulted from stress. If these negative emotions can be reduced, then the emotional connection to nature could be presented as a means to enhance the psychological well-being of the students (Marselle et al., 2016).

The results of the study also demonstrate that spiritual values were mediators for the relationship between nature connectedness and depression among undergraduate students. In addressing depression, the effects of nature connectedness has to be combined with spiritual values in order to significantly reduce depression. This is interesting to note because despite the fact that nature connectedness will significantly help to reduce depression, it is spiritual values instead of restorativeness, that will become the mediator and perhaps even the catalyst. The findings suggest that this indirect effect of nature connectedness on depression was negative and significant. The role of spiritual value in influencing nature connectedness lies in its emotional relationship, namely, in its sense of being one with nature, as part of the Creator's creations that can help to reduce emotional depression.

Spiritual values based on human relationships can potentially reduce the negative emotion of depression and at the same time enhance individual cognition (Beyer et al., 2014; Berman et al., 2012). This effect is able to give a sense of physical comfort, relieve emotions and a sense of spiritual closeness with God (Jakubec, 2016). The findings are in agreement with a previous study that suggested that the spiritual values of nature are associated with spiritual elements related to God's existence and that the relationship between humans and the nature made by the Creator can help significantly transform negative emotions into positive emotions and at the same time, influence a sense of secularism where nature is concerned (Trigwell et al., 2014; Katmisis & Francis, 2013). Conversely, results of the study also demonstrated that spiritual values

were not mediators for the relationship between nature connectedness with stress and anxiety. These results suggest that the other potential factors that were proposed to be mediators between nature connectedness and stress and anxiety include sensory involvement in nature that could help individuals become calmer and grounded (Martyn & Brymer, 2016).

The current study proposed a model of the relationship between nature connectedness, restorativeness, spiritual values and emotional disturbances (stress, anxiety and depression). The findings extend the current knowledge by not only considering the direct relationship between nature connectedness and undergraduate stress, anxiety and depression, but also the potential mediating role played by restorativeness and spiritual values. The proposed model which is based on the combination of multiple theories including Ecospsychology (Raszak, 1992); Attention Restoration Theory (ART) (Kaplan & Kaplan, 1989); Stress Recover Theory (SRT) (Ulrich, 1991); Theory of Anxiety (Freud, 1928); and Cognitive Theory of Depression (Beck, 1976), aims to demonstrate the impact of nature on human psyche as a means of possible alternative reflection on the lifestyle patterns of the present generation which is widely dependent on the internet, digital world and technology as medium or mediator when dealing with emotional disturbances. Michaelson et al. (2020) elucidated that diminishing exposure to nature could deprive young individuals of mentally beneficial experiences. They highlighted technology usage as a significant factor potentially obstructing their connection to nature, thereby potentially diminishing psychological well-being.

This study suggests that nature connectedness has the potential to help reduce stress if restorativeness is in place, while depression can only be mitigated by nature connectedness if spiritual values are present. Although the research was conducted within the context of Malaysia, it aligns with global research interests, particularly in exploring the relationship between nature connectedness and spiritual values. Scholars worldwide recognize the significance of these elements in transcendent experiences (Van Wieren & Kellert, 2013; Keaulana et al., 2021)

CONCLUSION

In summary, the proposed model underscores the profound significance of the natural environment in diminishing emotional disturbances and enhancing psychological well-being. Spiritual values, encompassing closeness, belief in practice, obedience to God, and psychosocial approaches, emerge as pivotal contributors to reducing emotional disturbances among students. The study advocates for the implementation of psychospiritual approaches, involving ritual worship, remembrance, and prayers, as integral components of a recovery process for improved psychological well-being and health prosperity. The study emphasizes the inherent miraculous elements within God's creation and highlights the manifold benefits it offers across emotional, physical, social, and spiritual dimensions. By recognizing and capitalizing on these benefits, the findings of this research promote a deeper understanding of the intricate relationship between emotional disturbances and the natural environment. The study encourages the utilization of nature connectedness and spiritual values as self-help tools, fostering an awareness that contributes to the enhancement of psychological well-being.

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Declarations of interest

None.

AUTHOR STATEMENT

The article has not been published previously, not under consideration for publication elsewhere, its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright holder.

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