Title

Relationship between university students' cognitive behavioral variables and mental health among university students

Authors

Tomonari Irie^{1 2}, Kengo Yokomitsu³, Yuji Sakano⁴

¹ School of Education and Culture, Hokusho University

² Graduate School of Psychological Science, Health Sciences University of Hokkaido

³ College of Comprehensive Psychology, Ritsumeikan University

⁴ School of Psychological Science, Health Sciences University of Hokkaido

Corresponding author

Tomonari Irie

School of Education and Culture, Hokusho University, 23 Bunkyo-dai, Ebetsu, Hokkaido, 069-8511, JAPAN

TEL: +81-11-386-8011, FAX: +81-11-387-8011, E-Mail: tirie30000@gmail.com

Abstract

Cognitive behavioral therapy is an effective treatment for improving mental health problems among university students. However, intervention components have different effects on mental health problems. This paper is a meta-analysis of the data concerning the relationship between cognitive behavioral variables and mental health status among university students. A total of 4 electronic databases were reviewed, and 1,227 articles met the initial selection criteria. Reviewers applied standardized coding schemes to extract the correlational relationship between cognitive behavioral variables and mental health status. A total of 54 articles were included in the meta-analysis. Correlations were found for three cognitive behavioral variables (attention, thought, and behavior) across nine mental health domains (negative affect, positive affect, happiness, social function, stress response, psychological symptom, quality of life, well-being, and general health). Across each cognitive behavioral process and all mental health domains, the estimated mean correlation is modest (.29 - .41), and the correlation depended on the domain of mental health.

Keywords: cognitive behavioral variables, cognitive behavioral therapy, mental health, university students, meta-analysis

Introduction

Mental health problems among university students is an important issue. Auerbach et al. (2016) analyzed data on the mental health problems of university students in each country using the World Mental Health Surveys. The results indicated that university students suffering from psychiatric disorders were reluctant to study at university and were unable to receive appropriate treatment. Steptoe et al. (2007) investigated the extent of depressive symptoms in 17,348 university students between the ages of 17 and 30 in 23 countries. They found that the prevalence university students with severe depressive symptoms were around 38% from East Asia (e.g., Japan, Korea), 13.9% for men and 17.1% for women from Western countries. Therefore, establishing and managing a support system in universities that focuses on mental health problems has become an important issue.

Mental health problems among university students have negative influences on academic performance and social function. Richardson et al. (2012) conducted a meta-analysis of 217 studies that examined the relationship between mental health status and academic performance. This analysis revealed that the intensity of general stress has a negative impact on academic performance. Weissman et al. (1999) investigated the influence of depressive and anxiety symptoms on daily life in adolescence and on social life throughout adulthood. This study showed that depressive and anxiety symptoms in adolescents influenced their job turnover rate and the likelihood that they will remain unmarried.

Cognitive behavior therapy (CBT) is widely applied as a psychological approach to promote

good mental health in university students. Charlesworth et al. (1981) examined the effect of relaxation training on state and trait anxiety in 18 college students. The results indicated that relaxation training reduces trait anxiety. Perna et al. (1998) examined the effect of cognitive behavioral stress management program on the mood states in 34 university students. The results showed that cognitive behavioral stress management program reduces dysphoric mood states. Rosenzweig et al. (2003) examined the effect of mindfulness training on mood states for 302 university students in their sophomore year. They found that mindfulness training reduces dysphoric mood states. Levin et al. (2016) examined the effect of web-based acceptance and commitment therapy on the academic concerns and well-being of 79 college students. The results indicated that acceptance and commitment therapy decrease academic concerns and improve social well-being.

CBT is an effective approach to improve mental health in university students. On the other hand, CBT includes many therapeutic component and outcome measures. Conley et al. (2013) conducted a systematic review on the effects of psychological interventions for promoting mental health in university students. The results indicated that mindfulness training is more effective than CBT, relaxation training, and meditation. Furthermore, CBT is more effective than relaxation training and meditation as well.

Current Study

Each component of psychological approaches on the mental health problems of university students has a different effect. The outcome measures of cognitive behavioral variables that affect the mental health problems of university students have not been verified. Identifying cognitive behavioral variables that strongly influence mental health status is important for providing psychological interventions. In the present study, we aim to conduct meta-analyses to identify cognitive behavioral variables influencing mental health status in university students.

Method

1. Definition of terms

First, we conceptualized cognitive behavioral variables with reference to Harvey et al. (2004). The conceptualization is as follows: (a) attention: attentional variables such as selective attention and mindfulness; (b) memory: memory variables such as overgeneral memory and memory distrust; (c) reasoning: reasoning variables such as interpretation and attribution; (d) thought: thinking variables such as rumination and belief; and (e) behavior: behavioral variables such as avoidance and coping. Second, we defined mental health as psychosocial health (state of complete mental and social well-being and not merely the absence of disease or infirmity (World Health Organization 2006)) based on WHO's definition of health.

2. Search strategy

We identified relevant articles in multiple electronic databases (PsycINFO, PubMed, CENTRAL, and CiNii). The search included articles published in English or Japanese from the earliest date available to December 23, 2016 in each database. The selected search terms were “universities,” “college,” “undergraduate,” “mental processes,” “adaptation, psychological,” “attitude,” “attention,” “psychology,” and “mental health.” After the database search, we also searched the reference sections of the articles for additional sources. Additionally, the Thesaurus of Psychological Index Terms, created by the American Psychological Association, can be used as a type of thesaurus search in PsycINFO. Therefore, we utilized this additional tool when searching PsycINFO to obtain all possible references in addition to the above-mentioned terminology.

3. Inclusion and exclusion criteria

Studies included for meta-analysis met the following criteria: (1) written in English or Japanese, (2) samples were specifically college or junior college students, (3) assessed a bivariate relationship between mental health status and cognitive behavioral variables, (4) reported an effect size measuring the bivariate association between cognitive behavioral variables and mental health status, and (5) published in a peer-reviewed journal. It also included baseline data for intervention studies. Studies were excluded if their samples were psychiatric patients.

4. Screening procedures

Based on the inclusion criteria, two independent raters evaluated “include,” “exclude,” and “unsure” for each article. The value of Kappa indicates fair agreement ($\kappa = .44$) (Higgins and Green 2008). Of the 1,227 articles extracted using the electronic search, we rejected 957 articles for which both the raters evaluated “exclude.” This resulted in 270 articles, of which 16 articles received the same “include” evaluation by both raters, 72 articles received the same “unsure” evaluation by both raters, and 182 articles were evaluated as either “include” or “unsure” by either rater. There were 14 duplicates among the 270 articles. Therefore, we searched the reference sections of the 256 articles. As a result of the reference section search, we extracted 39 new articles. Two raters independently read the full texts of the 295 articles and judged whether they should be subject to meta-analysis. A total of 54 articles were selected for the meta-analysis (Table 1). Figure 1 presents the procedure used to extract the articles.

5. Meta-analytic procedures

This study targeted investigations reporting on the bivariate relationship between cognitive behavioral variables and mental health status. Therefore, multivariable measures of association, such as regression coefficients, were excluded because they are not directly comparable to measures of bivariate association (Becker and Wu 2007). A meta-analysis was conducted for each combination of cognitive

behavioral process and mental health status. When effect size was reported in the same combination, it was integrated into the research (e.g., problem-solving coping and distractive coping in behavioral variables). To integrate effect size, we used Fisher's z scale weighted for sample size. In meta-analysis, clinical and statistical heterogeneity are inevitable because subjects and areas differ depending on the study (Higgins et al. 2003). Therefore, we used the random effect model to calculate effect size. Furthermore, we calculated I^2 (Higgins et al. 2003), and the statistical heterogeneity of the research included in the meta-analysis was confirmed. To confirm publication bias, we examined the symmetry of the funnel plot using a linear regression test (Egger et al. 1997) and the trim and fill method (Duval and Tweedie 2000). For all analyses, we used the R version 3.4.1 (R core team 2017). We used the metafor package (Viechtbauer 2017) to integrate effect size and examine the symmetry of the funnel plot.

Results

1. Characteristics of included studies

We extracted four cognitive behavioral variables, "attention," "memory," "thought," and "behavior" based on full-text reading. The process of "reasoning," which is one of the cognitive behavioral variables indicated by Harvey et al. (2004), was not extracted in this study. Meta-analysis was not performed on the process of "memory" because it was only extracted from one study. Keyes (2005) argued that a state with positive emotion without negative emotion and a state of fulfillment such as happiness and satisfaction with life are positive aspects of mental health. Based on the definitions in this study and Keyes' (2005) points, mental health was classified into nine categories: "negative affect," "positive affect," "happiness," "social function," "stress response," "psychological symptom," "quality of life (QOL)," "well-being," and "general health." Two experts determined each naming and classification. Table 2 presents the results of the classification, and Table 3 presents the scales used in each classification.

As Table 1 indicates, "behavior" (28 studies, 49 effect sizes) is the most common cognitive behavioral process related to mental health status. The second most common is "thought" (24 studies, 36 effect sizes) and the third is "attention" (20 studies, 36 effect sizes). "Psychological symptom" (37 studies, 44 effect sizes) is the most common mental health category related to the cognitive behavioral variables. The second most common is "negative affect" (12 studies, 16 effect sizes) and the third is "stress response" (12 studies, 14 effect sizes). Table 3 shows the meta-analysis results for each classification.

2. Relationship between attention and mental health status

Classification of attention included studies that measured the awareness of personal experiences such as body sensation, thought, and emotion (e.g., mindfulness, metacognitive awareness). Table 3 presents a medium correlation between attention and mental health status ($r = .34$, 95% confidence interval = .30 to .38). Because we observed a large statistical heterogeneity ($I^2 = 92.1\%$), we

conducted a subgroup analysis based on the classification of mental health.

Six studies reported a bivariate relationship between attention and negative affect. The results of this meta-analysis indicate a medium correlation between attention and negative affect ($r = -.39$, 95% confidence interval (CI) = $-.47$ to $-.31$). Two studies reported a bivariate relationship between attention and positive affect. The results of this meta-analysis indicate a small or medium correlation between attention and positive affect ($r = .23$, 95%CI = $.15$ to $.31$). Four studies reported a bivariate relationship between attention and happiness. The results of this meta-analysis indicate a small or medium correlation between attention and happiness ($r = .28$, 95%CI = $.15$ to $.41$). Five studies reported a bivariate relationship between attention and stress response. The results of this meta-analysis indicate a medium correlation between attention and stress response ($r = -.35$, 95%CI = $-.45$ to $-.25$). Nine studies reported a bivariate relationship between attention and psychological symptom. The results of this meta-analysis indicate a medium correlation between attention and psychological symptom ($r = -.34$, 95%CI = $-.43$ to $-.24$). Two studies reported a bivariate relationship between attention and QOL. The results of this meta-analysis indicate a medium correlation between attention and QOL ($r = .32$, 95%CI = $.23$ to $.40$). Three studies reported a bivariate relationship between attention and well-being. The results of this meta-analysis indicate a medium correlation between attention and well-being ($r = .39$, 95%CI = $.31$ to $.47$). Four studies reported a bivariate relationship between attention and general health. The results of this meta-analysis indicate a medium correlation between attention and general health ($r = .32$, 95%CI = $.17$ to $.48$). We did not conduct subgroup analysis because only one study reported a bivariate relationship between attention and social function.

3. Relationship between thought and mental health status

Classification of thought included studies that measured thinking variables (e.g., automatic thoughts, irrational belief). Table 3 presents a medium or large correlation between thought and mental health status ($r = .41$, 95%CI = $.35$ to $.47$). Because we observed a large statistical heterogeneity ($I^2 = 95.8\%$), we conducted a subgroup analysis based on the classification of mental health.

Seven studies reported a bivariate relationship between thought and negative affect. As a result of integrating the effect size, we found a medium or large correlation between thought and negative affect ($r = .46$, 95%CI = $.35$ to $.58$). Three studies reported a bivariate relationship between thought and happiness. As a result of integrating the effect size, we found a medium or large correlation between thought and happiness ($r = -.41$, 95%CI = $-.70$ to $-.11$). Four studies reported a bivariate relationship between thought and stress response. As a result of integrating the effect size, we found a medium correlation between thought and stress response ($r = .39$, 95%CI = $.26$ to $.53$). Seventeen studies reported a bivariate relationship between thought and psychological symptom. As a result of integrating the effect size, we found a medium or large correlation between thought and psychological symptom ($r = .41$, 95%CI = $.30$ to $.51$). Five studies reported a bivariate relationship between thought and general health. As a

result of integrating the effect size, we found a medium correlation between thought and general health ($r = -.37$, 95%CI = $-.44$ to $-.29$). We did not conduct subgroup analysis because no studies reported on the bivariate relationships between positive affect, social function, QOL, and well-being.

4. Relationship between behavior and mental health status

Classification of behavior included studies that measured coping processes of external or internal experiences (e.g., problem-solving coping, commitment). Table 3 presents a medium correlation between behavior and mental health status ($r = .29$, 95%CI = $.24$ to $.33$). Because a large statistical heterogeneity was observed ($I^2 = 95.2\%$), we conducted a subgroup analysis based on the classification of mental health.

Three studies reported a bivariate relationship between behavior and negative affect. As a result of integrating the effect size, we found a small or medium correlation between thought and negative affect ($r = -.29$, 95%CI = $-.35$ to $-.24$). Two studies reported a bivariate relationship between behavior and positive affect. As a result of integrating the effect size, there is no significant correlation between behavior and positive affect ($r = .28$, 95%CI = $-.12$ to $.69$). Five studies reported a bivariate relationship between behavior and happiness. As a result of integrating the effect size, we found a medium correlation between behavior and happiness ($r = .31$, 95%CI = $.16$ to $.46$). Four studies reported a bivariate relationship between behavior and social function. As a result of integrating the effect size, we found a small correlation between behavior and social function ($r = .19$, 95%CI = $.07$ to $.31$). Five studies reported a bivariate relationship between behavior and stress response. As a result of integrating the effect size, we found a medium correlation between behavior and stress response ($r = -.32$, 95%CI = $-.54$ to $-.09$). Seventeen studies reported a bivariate relationship between behavior and psychological symptom. As a result of integrating the effect size, we found a small or medium correlation between behavior and psychological symptom ($r = -.22$, 95%CI = $-.30$ to $-.15$). Three studies reported a bivariate relationship between behavior and well-being. As a result of integrating the effect size, we found a small or medium correlation between behavior and well-being ($r = .23$, 95%CI = $.17$ to $.29$). Nine studies reported a bivariate relationship between behavior and general health. As a result of integrating the effect size, we found a medium correlation between behavior and general health ($r = .35$, 95%CI = $.27$ to $.43$). We did not conduct a subgroup analysis because only one study reported a bivariate relationship between behavior and QOL.

5. Reporting bias

We assessed the risk of reporting bias through visual inspection and linear regression tests (Egger et al. 1997) of funnel plots. Because it has been argued that the test for funnel plot asymmetry should be used only when there are at least 10 studies (Higgins and Green 2008), we only conducted a linear regression test when there were over 10 studies. With the linear regression test, asymmetry of the

funnel plot was detected in studies that reported bivariate relations between attention and mental health status ($p < .001$). Based on the trim and fill method, the uncorrected effect size (before adding the possible missing studies) is .34 (95% confidence interval = .30 to .38), and the corrected effect size (after adding six possible missing studies) is .32 (95% confidence interval = .28 to .36). Although there is evidence of publication bias, its effect is not significant (Figure 2).

Discussion

This study is the first meta-analysis of the relationship between cognitive behavior variables and mental health status of university students. We found that the overall correlation coefficients between cognitive behavioral variables and mental health status were medium (attention: $r = .32$; thought: $r = .41$; behavior: $r = .29$). However, we detected a large heterogeneity (attention: $I^2 = 92.1\%$; thought: $I^2 = 95.8\%$; behavior: $I^2 = 95.2\%$), which means that the effect sizes probably depend on the variety of mental health status, while cognitive behavioral variables are related to mental health status. Therefore, we classified mental health as “negative affect,” “positive affect,” “happiness,” “social function,” “stress response,” “psychological symptom,” “QOL,” “well-being,” and “general health” and conducted a meta-analysis on them.

As Table 3 indicates, attention has larger effect sizes than behavior in well-being. In positive affect and QOL, attention shows significant effect sizes, but thought and behavior do not. Thought has larger effect sizes than attention and behavior on negative affect, happiness, stress response, psychological symptom, and general health. In social function, behavior shows significant effect sizes, but attention and thought do not. These findings suggest that attention is related to the positive aspects of mental health such as well-being, and thought is related to the negative aspects of mental health such as negative affect. Behavior is related to social function, but attention and thought are not.

As mentioned above, this study identifies cognitive behavioral variables that are strongly related to the mental health status of university students. Next, we review how these cognitive behavioral variables have been used in existing psychotherapy. To develop effective psychological intervention methods, we will consider what kind of future research is necessary.

These results support previous studies that examined the effects of psychological treatment. First, the classification of attention in this study includes mindfulness and metacognitive awareness (e.g., Mindful Attention Awareness Scale (Brown and Ryan 2003), Metacognition Questionnaire (Cartwright-Hatton and Wells 1997)). As techniques to promote mindfulness and metacognitive awareness, mindfulness-based psychotherapy (Segal et al. 2002), attention training (Wells 2000), and computer-based training to train attention (MacLeod et al. 2002) are available (Harvey et al. 2004). Mindfulness-based psychotherapy is the most frequently reported technique by clinical trials and meta-analyses (Bohlmeijer et al. 2010; Chiesa and Serretti 2009; Khoury et al. 2015) and is effective. Mindfulness is defined as “paying attention in a particular way: on purpose, in the present moment, and

nonjudgmentally” (Kabat-Zinn 1994). Several clinical trials and meta-analyses report that mindfulness-based psychotherapy has such an effect when it creates positive aspects in mental health (Lynch et al. 2011; Shapiro et al. 2007). Furthermore, integrating 23 meta-analyses that reported on the effectiveness of mindfulness-based psychotherapy revealed that mindfulness-based psychotherapy not only improved depressive symptoms (standard mean difference (SMD) = $-.37$) and anxiety symptoms (SMD = $-.48$) but also promoted QOL (SMD = $-.39$; Gotink et al. 2015). In previous research, while the subjects were not purely university students, mindfulness-based psychotherapy not only improved the negative aspects of mental health but also promoted the positive aspects. In addition, in the present study, the attention process was correlated with the positive aspects of mental health in university students (Bodenlos et al. 2015; Shapiro et al. 2011; Woodruff et al. 2013), so psychological interventions targeting the attention process may be effective when promoting positive mental health aspects in university students.

Second, the classification of thought in this study includes automatic thoughts and dysfunctional belief (e.g., Automatic Thought Questionnaire-Negative (Hollon and Kendall 1980), Dysfunctional Belief and Attitudes about Sleep Scale (Morin 1993)). Cognitive therapy is a technique to improve automatic thoughts and dysfunctional belief (Harvey et al. 2004). Cognitive therapy is a psychological treatment focused on thought that improves depressive symptoms and supports clients by observing and considering the thought processes (Beck 1964). The Society of Clinical Psychology (2016) reported that cognitive therapy is an effective treatment for depression. A meta-analysis suggests that the cognitive therapy treatment of depression has a higher remission rate as opposed to no type of intervention (Odds Ratio = 0.42 ; Jakobsen et al. 2011). Another meta-analysis shows that cognitive therapy improves generalized anxiety and social anxiety (Hanrahan et al. 2013; Ougrin 2011). In previous research, while subjects were not purely university students, cognitive therapy improved the negative aspects of mental health. In the present study, the thought process was correlated with the negative aspects of mental health in university students (Thanoi and Klainin-Yobas 2015; Wong 2010), so psychological interventions targeting the thought process may be effective treatments for the negative aspects of mental health in university students.

Third, the classification of behavior in this study included coping and commitment (e.g., Brief COPE Inventory (Carver 1997), Acceptance and Action Questionnaire (Bond and Bunce 2003)). As techniques to promote coping and commitment, behavioral activation and acceptance and commitment therapy are available (Harvey et al. 2004). Behavioral activation is a psychological treatment that focuses on increased engagement in adaptive activities, decreased engagement in activities that maintain depression or increase risk of depression, and solving problems that limit access to rewards or that maintain or increase aversive control (Dimidjian et al. 2011). Acceptance and commitment therapy is a psychological treatment that focuses on decreasing experiential avoidance and increasing action along the valued direction (Harris 2009). Behavioral activation and acceptance and commitment therapy are

effective in improving social dysfunctions because they aim to resolve problems by focusing on real-life behavior. In randomized controlled trials, behavioral activation and acceptance and commitment therapy are shown to be effective against social dysfunction (behavioral activation: $d = 1.21$, Hopko et al. (2011); acceptance and commitment therapy: *partial* $\eta^2 = .22$, Forman et al. (2012)). In previous research, while subjects were not purely university students, behavior activation and acceptance and commitment therapy improved social dysfunction. In the present study, the behavior process was correlated with the social function in university students (Koesten et al. 2009; Wang et al. 2016); therefore, psychological interventions that target the behavior process may be effective when it comes to social dysfunction in university students. As mentioned above, when providing psychological interventions to university students, it would be best to provide psychotherapy that focuses on the attention, thought, and behavior variables that target mental health problems.

This meta-analysis is not without limitations. First, we detected a large heterogeneity in the studies included in the meta-analysis. The heterogeneity did not affect the results of the present study because this meta-analysis used the random effect model. However, future studies must consider heterogeneities among university students. Studies focusing on university students have at times taken into consideration every possible demographic, such as a student's major (Kelly and Lambert 2012). In contrast, some studies were conducted without considering the differences in demographics (Waters 2014). These differences in demographics may affect the results of the analysis (Birks et al. 2009). In the future, it is necessary to analyze the data pertaining to each demographic and accumulate the findings. Furthermore, we could not conduct a meta-analysis on some of the classifications because we could not extract the required amount of data. Therefore, some relationships between cognitive behavioral variables and mental health status were unclear (e.g., thought and positive aspects of mental health (positive affect, QOL, and well-being)); it will be necessary to try and resolve this issue in the future.

Conclusion

The present study is the first to examine the relationship between cognitive behavioral variables and mental health status among university students using meta-analysis. The findings reveal that cognitive behavioral variables are overall correlated with mental health status. Therefore, psychological treatment based on CBT is effective for solving mental health problems among university students. Psychological treatment, including thought process, can be effective in treating the negative aspects of mental health, and the attention process can be effective in treating the positive aspects of mental health. However, this meta-analysis could not reveal some of the relationships between cognitive behavioral variables and mental health status.

Summarizing, psychological treatment based on CBT is effective in solving mental health problems among university students. However, outcomes are various, and several factors influence them. Therefore, when examining the effects of psychological treatment on university students, not only

appropriate approach to cognitive behavioral variables but also various outcomes should be included.

Acknowledgments

This work was supported by Japan Society for the Promotion of Science (JSPS) KAKENHI grant number 17K13944.

Author contributions

TI conceived of the study, participated in its design and coordination and drafted the manuscript; KY participated in the design of the study, performed the statistical analysis, and helped to draft the manuscript. YS participated in the design of the study and helped to draft the manuscript. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

References

- *Abe, K., Kawahito, J., & Otsuka, Y. (2014). Effects of reassurance seeking on interpersonal stress and mental health among university students. *Japanese Journal of Personality*, 23 (1), 29-37.
- *Anderson, C. A., & Arnoult, L. H. (1989). An examination of perceived control, humor, irrational beliefs, and positive stress as moderators of the relation between negative stress and health. *Basic and Applied Social Psychology*, 10 (2), 101-117.
- *Asano, K. (2010). Characteristics of individuals classified on the “Resignation Orientation Scale”. *Japanese Journal of Personality*, 19 (2), 105-116.
- Auerbach, R. P., Alonso, J., Axinn, W. G., Cuijpers, P., Ebert, D. D., Green, J. G., ...Bruffaerts, R. (2016). Mental disorders among college students in the World Health Organization World Mental Health Surveys. *Psychological Medicine*, 46 (14), 2955-2970.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13 (1), 27-45.
- Beck, A. T. (1964). Thinking and depression: II. Theory and therapy. *Archives of General Psychiatry*, 10 (6), 561-571.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety:

- Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56 (6), 893-897.
- Beck, A. T., Ward, C. H., Mendelsohn, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4 (6), 561-571.
- *Berking, M., Poppe, C., Luhmann, M., Wupperman, P., Jaggi, V., & Seifritz, E. (2012). Is the association between various emotion-regulation skills and mental health mediated by the ability to modify emotions? Results from two cross-sectional studies. *Journal of Behavior Therapy and Experimental Psychiatry*, 43 (3), 931-937.
- Berking, M., & Znoj, H. (2008). Entwicklung und Validierung eines Fragebogens zur standardisierten Selbsteinschätzung emotionaler Kompetenzen (SEK-27). [Development and validation of the emotion-regulation skills questionnaire (ERSQ-27)]. *Zeitschrift für Psychiatrie, Psychologie und Psychotherapie*, 56, 141e152.
- *Birks, Y., McKendree, J., & Watt, I. (2009). Emotional intelligence and perceived stress in healthcare students: A multi-institutional, multi-professional survey. *BMC Medical Education*, 9:61, DOI:10.1186/1472-6920-9-61.
- *Bodenlos, J. S., Wells, S. Y., Noonan, M., & Mayrsohn, A. (2015). Facets of dispositional mindfulness and health among college students. *Journal of Alternative and Complementary Medicine*, 21 (10), 645-652.
- Bohlmeijer, E., Prenger, R., Taal, E., & Cuijpers, P. (2010). The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: A meta-analysis. *Journal of Psychosomatic Research*, 68 (6), 539-544.
- *Bowlins, S. L., & Baer, R. A. (2012). Relationships between mindfulness, self-control, and psychological functioning. *Personality and Individual Differences*, 52 (3), 411-415.
- *Brittian, A. S., Kim, S. Y., Armenta, B. E., Lee, R. M., Umaña-Taylor, A. J., Schwartz, S. J., ...Hudson, M. L. (2015). Do dimensions of ethnic identity mediate the association between perceived ethnic group discrimination and depressive symptoms? *Cultural Diversity and Ethnic Minority Psychology*, 21 (1), 41-53.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84 (4), 822-848.
- Buhr, K., & Dugas, M. J. (2002). The intolerance of uncertainty scale: Psychometric properties of the English version. *Behavior Research and Therapy*, 40 (8), 931-945.
- *Calogero, R. M., & Pita, A. Body guilt: Preliminary evidence for a further subjective experience of self-objectification. *Psychology of Women Quarterly*, 35 (3), 428-440.
- Cartwright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: The Meta-Cognitions Questionnaire and its correlates. *Journal of Anxiety Disorders*, 11 (3), 279-296.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies a theoretically based approach. *Journal of Personality and Social Psychology*, 56 (2), 267-283.

- Charlesworth, E. A., Murphy, S., & Beutler, L. E. (1981). Stress management skill for nursing students. *Journal of Clinical Psychology, 37* (2), 284-290.
- *Chen, A. C., Szalacha, L. A., & Menon, U. (2014). Perceived discrimination and its associations with mental health and substance use among Asian American and Pacific Islander undergraduate and graduate students. *Journal of American College Health, 62* (6), 390-398.
- Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy perpole: A review and meta-analysis. *Journal of Alternative and complementary medicine, 15* (5), 593-600.
- *Coffey, K. A., Hartman, M., & Fredrickson, B. L. (2010). Deconstructing mindfulness and constructing mental health: Understanding mindfulness and its mechanisms of action. *Mindfulness, 1* (4), 235-253.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24* (4), 385-396.
- Conley, C. S., Durlak, J. A., & Dickson, D. A. (2013). An evaluative review of outcome research on universal mental health promotion and prevention programs for higher education students. *Journal of American College Health, 61* (5), 286-301.
- *Costa, H., Ripoll, P., Sánchez, M., & Carvalho, C. (2013). Emotional intelligence and self-efficacy: Effects on psychological well-being in college students. *Spanish Journal of Psychology, 16*, DOI: 10.1017/sjp.2013.39.
- Costello, C. G., & Comrey, A. L. (1967). Scales for measuring depression and anxiety. *Journal of Psychology, 66* (2), 303-313.
- Crandell, C. J., & Chambless, D. L. (1986). The validation of an inventory for measuring depressive thoughts: The Crandell Cognitions Inventory. *Behaviour Research and Therapy, 24* (4), 403-411.
- Crawford, J. R., & Henry, J. D. (2003). The Depression Anxiety Stress Scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology, 42*, 111-131.
- *Daikubara, M., Okuno, S., & Sawamiya, Y. (2013). Distracting response style and mental health. *Japanese Journal of Counseling Science, 46* (3), 138-147.
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44* (1), 113-126.
- *Deng, Y., Li, S., Tang, Y., Zhu, L., Ryan, R. M., & Brown, K. W. (2011). Psychometric properties of the Chinese translation of the Mindful Attention Awareness Scale (MAAS). *Mindfulness, 3* (1), 10-14.
- Derogatis, L. R. (1994). *Symptom Checklist-90-R: Administration, Scoring and Procedures Manual*. Minneapolis: National Computer Systems Person, Inc.
- Derogatis, L. R., & Spencer, P. M. (1982). *The brief symptom inventory: Administration, scoring and procedure manual*. Riderwood, MD: Clinical Psychometric Research, Inc.

- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95 (3), 542-575.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49 (1), 71-75.
- Dimidjian, S., Barrera Jr, M., Martell, C. R., Munoz, R. F., & Lewinsohn, P. M. (2011). The origins and current status of behavioral activation treatments for depression. *Annual Review of Clinical Psychology*, 7, 1-38.
- *Disch, W. B., Harlow, L. L., Campbell, J. F., & Dougan, T. R. (2000). Student functioning, concerns, and socio-personal well-being. *Social Indicators Research*, 51 (1), 41-74.
- Duval, S., & Tweedie, R. (2000). A nonparametric "Trim and Fill" method of accounting for publication bias in meta-analysis. *Journal of the American Statistical Association*, 95 (449), 89-98.
- D' Zurilla, T. J., Maydeu-Olivares, A., & Gallardo-Pujol, D. (2011). Predicting social problem solving using personality traits. *Personality and Individual Differences*, 50 (2), 142-147.
- Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *BMJ*, 315, 629-634.
- Ellison, C. W. (1983). Spiritual well-being: Conceptualization and measurement. *Journal of Psychology and Theology*, 11, 330-340.
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29, 177-190.
- *Flett, A. L., Haghbin, M., & Pychyl, T. A. (2016). Procrastination and depression from a cognitive perspective: An exploration of the associations among procrastinatory automatic thoughts, rumination, and mindfulness. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 34 (3), 169-186.
- Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment*, 9 (4), 445-451.
- Fordyce, M. W. (1988). A review of research on the happiness measures: A sixty second index of happiness and mental health. *Social Indicators Research*, 20 (4), 355-381.
- Forman, E. M., Shaw, J. A., Goetter, E. M., Herbert, J. D., Park, J., & Yuen, E. K. (2012). Long-term follow-up of a randomized controlled trial comparing acceptance and commitment therapy and standard cognitive behavior therapy for anxiety and depression. *Behavior Therapy*, 43 (4), 801-811.
- Frazier, P., Keenan N., Anders, S., Perera, S., Schallcross, S., & Hintz, S. (2011). Perceived past, present, and future control and adjustment to stressful life events. *Journal of Personality and Social Psychology*, 100 (4), 749-765.
- Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, 17 (6), 791-802.

- Furlong, M. J., You, S., Renshaw, T. L., Smith, D. C., & O' Malley, M. D. (2014). Preliminary development and validation of the social and emotional health survey for secondary school students. *Social Indicators Research*, 117 (3), 1011-1032.
- *Gilbert, B. D., & Christopher, M. S. (2009). Mindfulness-based attention as a moderator of the relationship between depressive affect and negative cognitions. *Cognitive Therapy & Research*, 34 (6), 514-521.
- Goldberg, D. (1978). *Manual of the general health questionnaire*. Windsor, United Kingdom: National Foundation for Educational Research.
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, 26 (1), 41-54.
- Green, D. E., Walkey, F. H., McCormick, I. A., & Taylor, A. J. (1988). Development and evaluation of a 21-item version of the Hopkins Symptom Checklist with New Zealand and United States respondents. *Australian Journal of Psychology*, 40 (1), 61-70.
- Greenglass, E., Schwarzer, R., Jakubiec, D., Fiksenbaum, L., & Taubert, S. (1999). The proactive coping inventory (PCI): A multidimensional research instrument. Paper presented at the 20th International Conference of the Stress and Anxiety Research Society, Cracow, Poland, July 12-14.
- *Griva, F., & Anagnostopoulos, F. (2010). Positive psychological states and anxiety: The mediating effect of proactive coping. *Psychological Reports*, 107 (3), 795-804.
- Hanrahan, F., Field, A. P., Jones, F. W., & Davey, G. C. L. (2013). A meta-analysis of cognitive therapy for worry in generalized anxiety disorder. *Clinical Psychology Review*, 33 (1), 120-132.
- Harris, R. (2009). *Act made simple: An easy-to-read primer on acceptance and commitment therapy*. Oakland; New Harbinger Publications.
- Harvey, A.G., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive Behavioural Processes Across Psychological Disorders: A transdiagnostic approach to research and treatment*. New York; Oxford University Press.
- *Higata, A., & Saito, S. (2007). Time perspective, recollection of life events, and mental health in adolescence. *Japanese Journal of Developmental Psychology*, 18 (2), 109-119.
- Higgins, J. P. T. & Green, S. (Eds.) (2008). *Cochrane handbook for systematic reviews of intervention*. Chichester, England, UK; Wiley.
- Higgins, J. P. T., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ*, 327, 557-560.
- Hills, P., & Argyle, M. (2002). The Oxford Happiness Questionnaire: A Compact scale of the measurement of psychological well-being. *Personality and Individual Differences*, 33 (7), 1073-1082.
- *Hintz, S., Frazier, P. A., & Meredith, L. (2015). Evaluating an online stress management intervention for

- college students. *Journal of Counseling Psychology*, 62 (2), 137-147.
- Hollon, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an automatic thoughts questionnaire. *Cognitive Therapy and Research*, 4 (4), 383-395.
- Hopko, D. R., Armento, M. E. A., Robertson, S. M. C., Ryba, M. M., Carvalho, J. P., Colman, L. K., et al. (2011). Brief behavioral activation and problem-solving therapy for depressed breast cancer patients: Randomized trial. *Journal of Consulting and Clinical Psychology*, 79 (6), 834-849.
- *Hovey, J. D., & Seligman, L. D. (2007). Religious coping, family support, and negative affect in college students. *Psychological Reports*, 100, 787-788.
- Ingram, R. E., & Wisnicki, K. S. (1988). Assessment of positive automatic cognition. *Journal of Consulting and Clinical Psychology*, 56 (6), 898-902.
- *Iwasaki, Y. (2003). Roles of leisure in coping with stress among university students: A repeated-assessment field study. *Anxiety, Stress, and Coping*, 16 (1), 31-57.
- Jakobsen, J. C., Hansen, J. L., Storebø, O. J., Simonsen, E., & Gluud, C. (2011). The effects of cognitive therapy versus 'no intervention' for major depressive disorder. *PLoS ONE*, DOI: 10.1371/journal.pone.0028299.
- *Jayalakshmi, V., & Magdalin, S. (2015). Emotional intelligence, resilience and mental health of women college students. *Journal of Psychosocial Research*, 10 (2), 401-408.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- *Kato, T. (2000). Construction of the Interpersonal Stress-Coping Inventory for undergraduates. *Japanese Journal of Educational Psychology*, 48 (2), 225-234.
- *Katsuya, N. (2004). Reliability and validity of Japanese revised version of reassurance-seeking scale. *Japanese Journal of Personality*, 13 (1), 11-20.
- *Kawahito, J., & Otsuka, Y. (2010). Acute and intermediate effects of optimism of depression for university students before practice teaching: Structural equation modeling. *Journal of School Mental Health*, 13 (1), 9-18.
- Kelly, T. M., & Lambert, E. G. (2012). Mindfulness as a potential means of attenuating anger and aggression for prospective criminal justice professionals. *Mindfulness*, DOI: 10.1007/s12671-012-0090-9.
- Keyes, C. L. M. (2005). Mental illness and/or mental health? : Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, 73 (3), 539-548.
- *Khan, Z. H., Watson, P. J., & Chen, Z. (2016). Muslim spirituality, religious coping, and reactions to terrorism among Pakistani university students. *Journal of Religion and Health*, 55 (6), 2086-2098.
- Khoury, N., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research*, 78 (6), 519-528.
- Kikuchi, K. (1988). *Research on Science of Compassion: Psychology and Skill Orienting to Social*

Behavior. Tokyo, Kawashima-Shoten.

- *Kim, P. Y., Kendall, D. L., & Webb, M. (2015). Religious coping moderates the relation between racism and psychological well-being among Christian Asian American college students. *Journal of Counseling Psychology*, 62 (1), 87-94.
- *Kitami, Y., & Mori, K. (2010). The relationship between job search stressors, mental health and social skills in Japanese university students. *Stress Science Research*, 25, 27-45.
- *Koesten, J., Schrodtt, P., & Ford, D. (2009). Cognitive flexibility as a mediator of family communication environments and young adults' well-being. *Health Communication*, 24 (1), 82-94.
- *Kraemer, K. M., O' Bryan, E. M., & McLeish, A. C. (2016). Intolerance of uncertainty as a mediator of the relationship between mindfulness and health anxiety. *Mindfulness*, 7 (4), 859-865.
- Kroenke, K., Spitzer, R. L., & Williams, B. W. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16 (9), 606-613.
- Kwan, V. S. Y., Bond, M. H., & Singelis, T. M. (1997). Pancultural explanations for life satisfaction adding relationship harmony to self-esteem. *Journal of Personality and Social Psychology*, 73 (5), 1038-1051.
- Levin, M. E., Haeger, J. A., Pierce, B., & Twohig, M. P. (2016). Web-based acceptance and commitment therapy for mental health problems in college students: A randomized control trial. *Behavior Modification*, 41 (1), 141-162.
- Liss, M., & Erchull, M. J. (2015). Not hating what you see: Self-compassion may protect against negative mental health variables connected to self-objectification in college women. *Body Image*, 14, 5-12.
- *Luo, Y., & Wang, H. (2009). Correlation research on psychological health impact on nursing students against stress, coping way and social support. *Nurse Education Today*, 29 (1), 5-8.
- Lynch, S., Gander, M., Kohls, N., Kudielka, B., & Walach, H. (2011). Mindfulness-based coping with university life: A non-randomized wait-list-controlled pilot evaluation. *Stress and Health*, 27 (5), 365-375.
- MacLeod, C., Rutherford, E., Campbell, L., Ebsworthy, G., & Holker, L. (2002). Selective attention and emotional vulnerability: Assessing the causal basis of their association through the experimental manipulation of attentional bias. *Journal of Abnormal Psychology*, 111, 107-23.
- *Mahmoud, J. S., Staten, R., Hall, L. A., & Lennie, T. A. (2012). The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues in Mental Health Nursing*, 33 (3), 149-156.
- Malcarne, V. L., Chavira, D. A., Fernandez, S., & Liu, P. (2006). The scale of ethnic experience: Development and psychometric properties. *Journal of Personality Assessment*, 86 (2), 150-161.
- *Marino, C., Vieno, A., Lenzi, M., Fernie, B. A., Nikčević, A. V., & Spada, M. M. (2016). Personality traits and metacognitions as predictors of positive mental health in college students. *Journal of Happiness Studies*, DOI: 10.1007/s10902-016-9825-y.

- Martin, M. M., & Rubin, R. B. (1995). A new measure of cognitive flexibility. *Psychological Reports*, 76, 623-626.
- *Masuda, A., Anderson, P. L., & Sheehan, S. T. (2009). Mindfulness and mental health among African American college students. *Journal of Evidence-Based Complementary & Alternative Medicine*, 14 (3), 115-127.
- *Masuda, A., Price, M., Anderson, P., & Wendell, J. W. (2010). Disordered eating-related cognition and psychological flexibility as predictors of psychological health among college students. *Behavior Modification*, 34 (1), 3-15.
- *Masuda, A., & Tully, E. C. (2012). The role of mindfulness and psychological flexibility in somatization, depression, anxiety, and general psychological distress in a nonclinical college sample. *Journal of Evidence-Based Complementary & Alternative Medicine*, 17 (1), 66-71.
- *Masuda, A., & Wendell, J. W. (2010). Mindfulness mediates the relation between disordered eating-related cognitions and psychological distress. *Eating Behaviors*, 11 (4), 293-296.
- McKinley, N. M., & Hyde, J. S. (1996). The Objectified Body Consciousness Scale. *Psychology of Women Quarterly*, 20 (2), 181-215.
- Metalsky, G. I., & Joiner, T. E., Jr. (1997). The Hopelessness Depression Symptom Questionnaire. *Cognitive Therapy and Research*, 21 (3), 359-384
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the penn state worry questionnaire. *Behaviour Research and Therapy*, 28 (6), 487-495.
- Mizes, J. S., Christiano, B., Madison, J., Post, G., Seime, R., & Varnado, P. (2000). Development of the Mizes Anorectic Cognitions Questionnaire-Revised: Psychometric properties and factor structure in a large sample of eating disorder patients. *International Journal of Eating Disorder*, 28 (4), 415-421.
- Mond, J. M., Hay, P. J., Rodgers, B., & Owen, C. (2006). Eating Disorder Examination Questionnaire (EDE-Q): Norms for young adult women. *Behavior Research and Therapy*, 44 (1), 53-62.
- *Montes-Berges, & Augusto, J. M. (2007) Exploring the relationship between perceived emotional intelligence, coping, social support and mental health in nursing students. *Journal of Psychiatric and Mental Health Nursing*, 14, 163-171.
- Morey, L. C. (1991). *The Personality Assessment Inventory professional manual*. Odessa, FL: Psychological Assessment Resources.
- Morin, C. M. (1993). *Insomnia: Psychological Assessment and Management*. New York: Guilford Press.
- Murayama, Y., & Okayasu, T. (2012). Effect of metacognitive awareness on reactivity to negative cognitions. *Japanese Journal of Health Psychology*, 25 (2), 10-18.
- *Murayama, Y., & Okayasu, T. (2013). Effect of metacognitive awareness on alleviating depression in female college freshmen. *Japanese Journal of Health Psychology*, 26 (1), 28-37.
- Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223-250.

- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, 61 (1), 115-121.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology*, 67 (1), 92-104.
- *de Oliveira, I. R., Seixas, C., Osório, F. L., Crippa, J. A. S., de Abreu, J. N., Menezes, I. G., ... Wenzel, A. (2015). Evaluation of the psychometric properties of the Cognitive Distortions Questionnaire (CD-Quest) in a sample of undergraduate students. *Innovations in Clinical Neuroscience*, 12 (7-8), 20-27.
- Ougrin, D. (2011). Efficacy of exposure versus cognitive therapy in anxiety disorders: Systematic review and meta-analysis. *BMC Psychiatry*, DOI: 10.1186/1471-244X-11-200.
- Ozeki, Y. (1993). Refining the stress self-rating scale for university students: Toward a transactional analysis. *The annual of the Graduate School of Comparative Studies of International Cultures and Societies*, 1, 95-114.
- Pargament, K., Feuille, M. & Burdzy, D. (2011). The Brief RCOPE: Current psychometric status of a short measure of religious coping. *Religions*, 2 (1), 51-76.
- Perna, F. M., Antoni, M. H., Kumar, M., Cruess, D. G., & Schneiderman, N. (1998). Cognitive-behavioral intervention effects on mood and cortisol during exercise training. *Annals of Behavioral Medicine*, 20 (2), 92-98.
- R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Retrieved from <https://www.R-project.org/> (August 1, 2017.)
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1 (3), 385-401.
- *Ranjbar, M., Bayani, A. A., & Bayani, A. (2013). Social problem solving ability predicts mental health among undergraduate students. *International Journal of Preventive Medicine*, 4 (11), 1337-1341.
- Richardson, M., Abraham, C., Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138 (2), 353-387.
- Rosenzweig, S., Reibel, D. K., Greeson, J. M., Brainard, G. C., & Hojat, M. (2003). Mindfulness-based stress reduction lowers psychological distress in medical students. *Teaching and Learning in Medicine*, 15 (2), 88-92.
- Rost, K., Burnam, M. A., & Smith, G. R. (1993). Development of screeners for depressive disorders and substance disorder history. *Medical Care*, 31, 189-200.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57 (6), 1069-1081.
- Salovey, P., Mayer, J. D., Goldman, S., Turvey, C., & Palfai, T. (1995). Emotional attention, clarity, and

- repair: exploring emotional intelligence using the trait meta-mood scale. In Pennebaker J. D. (Ed.), *Emotion, disclosure, and health*. Washington: American Psychological Association.
- Sandhu, D. S., & Asrabadi, B. R. (1994). Development of an acculturative stress scale for international students: Preliminary Findings. *Psychological Reports*, 75 (1), 435-448.
- *Sasaki, M., & Yamasaki, K. (2005). Dispositional and situational coping and mental health status of university students. *Psychological Reports*, 97 (3), 797-809
- Schmeck, R. R. (1983). Learning style of college students. In Dillon, R., & Schmeck, R. R. (eds.), *Individual Differences in Cognition*. New York: Academic Press.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford Press
- Sell, H. (1994). The subjective well-being inventory (SUBI). *International Journal of Mental Health*, 23 (3), 89-102.
- *Sezai, I., Tanaka, K., & Munakata, T. (2015). Relationship between cognition of stress temperaments and mental health among university students. *Journal of Health Counseling*, 21, 67-76.
- Shapiro, S. L., Brown, K. W., & Biegel, G. M. (2007). Teaching self-care to caregivers: Effects of mindfulness-based stress reduction on the mental health of therapists in training. *Training and Education Professional Psychology*, 1 (2), 105-115.
- *Shapiro, S. L., Brown, K. W., Thoresen, C., & Plante, T. G. (2011). The moderation of Mindfulness-based stress reduction effects by trait mindfulness: results from a randomized controlled trial. *Journal of Clinical Psychology*, 67 (3), 267-277.
- Shimazu, N. (2010). Construction of a new response style scale and examination of its reliability and validity. *Gakujutsu Kenkyu, Waseda University, Series of Educational Psychology*, 58, 29-39.
- Shirai, T. (1994). A study on the construction of Experimental Time Perspective Scale. *Japanese Journal of Psychology*, 65 (1), 54-60.
- Skevington, S. M., Lotfy, M., O'Connell, K. A. (2004). The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Quality of Life Research*, 13 (2), 299-310.
- Society of Clinical Psychology (2016). *Psychological Treatment: Division 12 of the American Psychological Association*. Retrieved from <http://www.div12.org/psychological-treatments/> (October 2017).
- Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166 (10), 1092-1097.
- Steptoe, A., Tsuda, A., Tanaka, Y., & Wardle, J. (2007). Depressive symptoms, socio-economic background, sense of control, and cultural factors in university students from 23 countries.

International Journal of Behavioral Medicine, 14 (2), 97-107.

- *Su, Y., & Chen, S. (2015). Emerging posttraumatic growth: A prospective study with pre- and posttrauma psychological predictors. *Psychological Trauma: Theory, Research, Practice, and Policy*, 7 (2), 103-111.
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ...Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life*, 5, DOI: 10.1186/1477-7525-5-63.
- *Thanoi, W., & Klainin-Yobas, P. (2015). Assessing rumination response style among undergraduate nursing students: A construct validation study. *Nurse Education Today*, 35 (5), 641-646.
- Thanoi, W., Panitrat, R., Phanchaoenworakul, K., Thompson, E., Nityasuddhi, D. (2011). The Adolescent Ruminative Response Scale Thai version: Psychometric properties. *Journal of Nursing Science*, 29 (3), 29-38.
- Thompson, T., Dinnel, D. L., & Dill, N. J. (2003). Development and validation of a Body Image Guilt and Shame Scale. *Personality and Individual Differences*, 34, 59-75.
- Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology*, 76 (2), 284-304.
- *Tucker, R. P., Wingate, L. R., & O' Keefe, V. M. (2016). Historical loss thinking and symptoms of depression are influenced by ethnic experience in American Indian college students. *Cultural Diversity and Ethnic Minority Psychology*, 22 (3), 350-358.
- *Vand, H. D. A., Gharraee, B., Farid, A. A., & Bandi, M. G. (2014). Prediction of insomnia severity based on cognitive, metacognitive, and emotional variables in college students. *EXPLORE: Journal of Science and Healing*, 10 (4), 233-240.
- Veit, C. T., & Ware, J. E. (1983). The structure of psychological distress and well-being in general populations. *Journal of Consulting and Clinical Psychology*, 51 (5), 730-742.
- Viechtbauer, W. (2017). *Package 'metafor'*. <https://cran.r-project.org/web/packages/metafor/metafor.pdf> (August 21, 2017.)
- *Wang, S., Wong, Y. J., Yeh, K. (2016). Relationship harmony, dialectical coping, and nonattachment: Chinese indigenous well-being and mental health. *Counseling Psychologist*, 44 (1), 78-108.
- Ware, J. E. Jr. & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Medical Care*, 30 (6), 473-483.
- Waters, T. E. A. (2014). Relations between the functions of autobiographical memory and psychological wellbeing. *Memory*, 22 (3), 265-275.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54 (6), 1063-1070.

- Weissman, M. M., Wolk, S., Wickramaratne, P., Goldstein, R. B., Adams, P., Greenwald, S., ...Steinberg, D. (1999). Children with prepubertal-onset major depressive disorder and anxiety grown up. *Archives of General Psychiatry*, 56 (9), 794-801.
- Wells, A. (2000). *Emotional disorders and metacognition: innovative cognitive therapy*. Chichester: Wiley.
- Williams, D. R., Yu, Y., Jackson, J. S., & Anderson, N. B. (1997). Racial differences in physical and mental health: Socio-economic status, stress and discrimination. *Journal of Health Psychology*, 2 (3), 335-351.
- *Wong, S. S. (2010). Balanced states of mind in psychopathology and psychological well-being. *International Journal of Psychology*, 45 (4), 269-277.
- *Wong, Y. J., Tsai, P., Liu, T., Zhu, Q., & Wei, M. (2014). Male Asian international students' perceived racial discrimination, masculine identity, and subjective masculinity stress: a moderated mediation model. *Journal of Counseling Psychology*, 61 (4), 560-569.
- *Woodruff, S. C., Glass, C. R., Arnkoff, D. B., Crowley, K., Hindman, R. K., & Hirschhorn, E. W. (2013). Comparing self-compassion, mindfulness, and psychological inflexibility as predictors of psychological health. *Mindfulness*, 5 (4), 410-421.
- World Health Organization. (2006). Constitution of the World Health Organization. Retrieved from http://www.who.int/governance/eb/who_constitution_en.pdf (May 25, 2017.)
- *Zhou, L., Chen, J., Liu, X., Lu, D., & Su, L. (2013). Negative cognitive style as a mediator between self-compassion and hopelessness depression. *Social Behavior and Personality*, 41 (9), 1511-1518.
- Zuckerman, M. (1960). The development of an affect adjective check list for the measurement of anxiety. *Journal of Consulting Psychology*, 24, 457-462.
- Zung, W. W. K. (1965). A self-rating depression scale. *Archives of General Psychiatry*, 12 (1), 63-70.

Figure 1 Flowchart of study selection.

Table 1 Classification of included studies.

Category	Studies	<i>N</i>
Cognitive behavioral variables		
Attention	20	36
Memory	1	2
Thought	24	36
Behavior	28	49
Mental health		
Negative affect	12	16
Positive affect	3	4
Happiness	7	12
Social function	6	6
Stress response	12	14
Psychological symptoms	37	44
Quality of life	2	3
Well-being	6	6
General Health	11	18

Table 2 Measures used in each classification.

Measure	Psychometrics		Studies
	α	r_{xx}	
Attention			
Mindful Attention Awareness Scale (Brown & Ryan, 2003)	.80	.81	Deng et al. (2011) Flett et al. (2016) Gilbert & Christopher (2009) Masuda et al. (2009) Masuda & Tully (2012) Masuda & Wendell (2010) Shapiro et al. (2011) Woodruff et al. (2013)
Five Facet Mindfulness Questionnaire (Baer et al., 2006)	.75 - .91	-	Bodenlos et al. (2015) Bowlin & Baer (2012) Coffey et al. (2010) Woodruff et al. (2013)
Trait Meta-Mood Scale (subscale; Attention, Clarity) (Salovey et al., 1995)	.86 - .90	-	Coffey et al. (2010) Costa et al. (2013) Montes-Berges & Augusto (2007)
Metacognition questionnaire (Cartwright-Hatton & Wells, 1997)	.72 - .89	.76 - .94	Marino et al. (2016) Vand et al. (2014)
Emotion-Regulation Skills Questionnaire (subscale; Awareness) (Berking & Znoj, 2008)	.90	.75	Berking et al. (2012)
Cognitive and Affective Mindfulness Scale-Revised (Feldman et al., 2007)	.74 - .77	-	Kraemer et al. (2016)
Metacognitive Awareness Scale (Murayama & Okayasu, 2012)	.87	-	Murayama & Okayasu (2013)
Self-Compassion Scale (subscale; Mindfulness) (Neff, 2003)	.81	.85	Zhou et al. (2013)
Lerning Styles Inventory (subscale; Deep cognitive processing) (Schmeck, 1983)	.82	.88	Disch et al. (2000)

Note . The psychometrics include measures of internal consistency (α) and test re-test reliability (r_{xx}).

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Memory			
Experimental Time Perspective Scale (subscale; Acceptance of past) (Shirai, 1994)	.67	.79	Higata & Saito (2007)
Thought			
Objectified Body Consciousness Scale (subscale; Surveillance) (McKinley & Hyde, 1996)	.76 - .89	-	Calogero & Pina (2011)
Dysfunctional Belief and Attitudes about Sleep Scale (Morin, 1993)	.69	-	Vand et al. (2014)
Perceived Control Over Stressful Events Scale (subscale; Present control) (Frazier et al 2011)	.79 - .86	.48 - .59	Hintz et al. (2015)
Response Styles Questionnaire (subscale; Ruminative) (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al, 1994)	-	.80	Daikubara et al. (2013) Flett et al. (2016) Su & Chen (2015) Thanoi & Klainin-Yobas (2015)
Intolerance of Uncertainty Scale (Freestone et al., 1994; Buhr & Dugas, 2002)	.94	.74	Kraemer et al. (2016)
Mizes Anorectic Cognitions Questionnaire-Revised (Mizes et al., 2000)	.90	-	Masuda et al. (2010) Masuda & Wendell (2010)
Crandell Cognitions Inventory (Crandell & Chambless, 1986)	.95	-	Gilbert & Christopher (2009)
Emotion-Regulation Skills Questionnaire (subscale; Tolerance, Readiness to confront distressing situations) (Berking & Znoj, 2008)	.90 - .93	.75 - .78	Berking et al. (2012)
Rumination Reflection Questionnaire (Trapnell & Campbell, 1999)	.90 - .91	-	Coffey et al. (2010)
Cognitive Distortion Questionnaire (de Oliveira et al., 2015)	.85	.87	de Oliveira et al. (2015)

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Thought			
Automatic Thought Questionnaire-Negative (Hollon & Kendall, 1980)	.98	-	Wong (2010)
Automatic Thought Questionnaire-Positive (Ingram & Wisnicki, 1988)	.97	-	Wong (2010)
Reassurance-seeking Scale (subscale; Reassurance-seeking from significant others) (Katsuya, 2004)	.80	.79	Abe et al. (2014) Katsuya (2004)
Scale of Ethnic Experience (subscale; Perceived discrimination) (Malcarne et al., 2006)	.83 - .91	.77 - .86	Brittian et al. (2015) Tucker et al. (2016)
Acculturative Stress Scale for International Students (subscale; Perceived discrimination) (Sandhu & Asrabadi, 1994)	.92	-	Wong et al. (2014)
Everyday Discrimination Scale (Williams et al., 1997)	.88	-	Chen et al. (2014)
Response Styles Scale (subscale; Rumination) (Shimazu et al., 2010)	.82 - .89	-	Asano (2010)
Measure of Self-Denial Image (Munakata, 2006)	.84	-	Sezai et al. (2015)
Behavior			
Acceptance and Action Questionnaire (Bond & Bunce, 2003)	.88 - .90	.72	Masuda et al. (2009) Masuda et al. (2010) Masuda & Tully (2012) Woodruff et al. (2013)
Dialectical Coping Scale (Wang et al., 2016)	.81	-	Wang et al. (2016)
Brief COPE Inventory (Carver, 1997)	.81 - .88	-	Mahmoud et al. (2012)

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Behavior			
Interpersonal Stress-Coping Inventory (Kato, 2000)	.80 - .87	.86 - .92	Kato (2000)
Emotional Intelligence Scale (Schutte et al., 1998)	.87	-	Birks et al. (2009) Jayalakshmi & Magdalin (2015)
General Coping Questionnaire (subscale; dispositional coping) (Sasaki & Yamasaki, 2002)	.86 - .92	.63 - .86	Sasaki & Yamasaki (2005)
Religious Coping Scale (Boudreaux et al., 1995)	.97	-	Hovey & Seligman (2007)
Trait Meta-Mood Scale (subscale; Repair) (Salovey et al., 1995)	.86 - .90	-	Coffey et al. (2010) Costa et al. (2013) Montes-Berges & Augusto (2007)
Trait Coping Style Questionnaire (Wang, 1999)	-	-	Luo & Wang (2009)
Response Styles Scale (subscale; distraction) (Shimazu et al., 2010)	.82 - .89	-	Asano (2010)
Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004)	.76 - .90	-	Coffey et al. (2010)
Proactive Coping Inventory (Greenglass et al., 1999)	.80 - .85	-	Griva & Anagnostopoulos (2010)
Brief Religious Coping Scale (Pargament et al., 2011)	.60 - .94	-	Khan et al. (2016) Kim et al. (2015)
Cognitive Flexibility Scale (Martin & Rubin, 1995)	.72 - .82	-	Koesten et al. (2009)
Social Problem-Solving Inventory-Revised (D' Zurilla et al., 2011)	.68 - .91	-	Ranjbar et al. (2013)
Coping Orientation for Problem Experiences (Carver et al., 1989)	.45 - .92	.46 - .86	Iwasaki (2003)
Response Styles Questionnaire (subscale; Distracting) (Nolen-Hoeksema & Morrow, 1991)	-	.80	Daikubara et al. (2013)
Kikuchi's Social Skill Scale (Kikuchi, 1988)	.75 - .77	-	Kitami & Mori (2010)

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Negative affect			
Positive and Negative Affect Schedule (subscale; Negative affect) (PANAS; Watson et al., 1988)	.84 - .87	.39 - .71	Anderson & Arnoult (1989) Deng et al. (2011) Kraemer et al. (2016) Wang et al. (2016) Woodruff et al. (2013)
Depression Anxiety Stress Scale (subscale; Depression, Anxiety) (DASS; Crawford, & Henry, 2003)	.90 - .95	-	Bowlin & Baer (2012) Flett et al. (2016) Hintz et al. (2015) Mahmoud et al. (2012) Vand et al. (2014)
Thought, Feeling, and Experience Questionnaire (subscale; Depression, Anxiety, Hopelessness) (TEFQ; Thanoi et al., 2011)	.90	-	Thanoi & Klainin-Yobas (2015)
Objectified Body Consciousness Scale (subscale; Body shame) (McKinley & Hyde, 1996)	.72 - .89	.73 - .79	Calogero & Pina (2011)
Body Image Guilt and Shame Scale (subscale; Body guilt) (Thompson et al., 2003)	.88 - .90	-	Calogero & Pina (2011)
Multiple Affect Adjective Check List (Zuckerman, 1960)	.72 - .85	.31 - .68	Anderson & Arnoult (1989)
Positive affect			
Positive and Negative Affect Schedule (subscale; Positive affect) (PANAS; Watson et al., 1988)	.86 - .90	.47 - .68	Deng et al. (2011) Wang et al. (2016) Woodruff et al. (2013)
Happiness			
Satisfaction with Life Scale (SWLS; Diener et al., 1985)	.87	.82	Asano (2010) Costa et al. (2013) Wong (2010) Woodruff et al. (2013)
Fordyce Emotion Questionnaire (Fordyce, 1988)	-	.86	Woodruff et al. (2013)
Social and Emotional Health Surveys (SEHS; Furlong et al., 2014)	.92	-	Marino et al. (2016)
Spiritual Well-Being Scale (subscale; Existential well-being) (Ellison, 1983)	-	-	Disch et al. (2000)
Oxford Happiness Questionnaire-Short (Hill & Aygyle, 2002)	.78	0.86	Wong (2010)

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Happiness			
Subjective Well-Being Inventory (subscale; Happiness) (Sell, 1994)	.84	-	Daikubara et al. (2013)
Social function			
Medical Outcomes Study Short Form Sruvey (subscale; Social functioning) (Ware & Sherbourne, 1992)	.80	-	Bodenlos et al. (2015)
Interpersonal Relationship Harmony Inventory (Kwan et al., 1997)	-	-	Wang et al. (2016)
General Health Questionnaire (subscale; Social dysfunction) (Goldberg, 1978)	.70 - .90	-	Higata & Saito (2007) Koesten et al. (2009) Ranjbar et al. (2013) Sasaki & Yamasaki (2005)
Stress response			
Interpersonal Reactivity Index (subscale; Personal distress) (Davis, 1983)	.71 - .77	.62 - .71	Masuda et al. (2009) Masuda et al. (2010) Masuda & Wendell (2010)
Perceived Stress Scale (Cohen et al., 1983)	.84 - .86	.85	Birks et al. (2009) Bodenlos et al. (2015) Shapiro et al. (2011)
Depression Anxiety Stress Scale (subscale; Stress) (DASS; Crawford, & Henry, 2003)	.93	-	Bowlin & Baer (2012) Hintz et al. (2015) Mahmoud et al. (2012)
Thought, Feeling, and Experience Questionnaire (subscale; Stress) (TEFQ; Thanoi et al., 2011)	.90	-	Thanoi & Klainin-Yobas (2015)
Stress Self-Rating Scale for University Students (Ozeki, 1993)	.61 - .71	-	Kato (2000)
Psychological symptoms			
Beck Depression Inventory (Beck, 1961)	.86	-	Abe et al. (2014) Anderson & Arnoult (1989) Hovey & Seligman (2007) Katsuya (2004) de Oliveira et al. (2015) Wong (2010) Woodruff et al. (2013)
Beck Anxiety Inventory (Beck et al., 1988)	.92	.75	Oliveira et al. (2015) Wong (2010) Woodruff et al. (2013)

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Psychological symptoms			
Center for Epidemiologic Studies Depression Scale (Radloff, 1977)	.85	.53	Asano (2010) Brittian et al. (2015) Gilbert & Christopher (2009) Kawahito & Otsuka (2010) Tucker et al. (2016)
Medical Outcomes Study Short Form Survey (subscale; Mental health 5) (Ware & Sherbourne, 1992)	.77	-	Montes-Berges & Augusto (2007)
Brief Symptom Inventory (Derogatis & Spencer, 1982)	.74 - .89	-	Berking et al. (2012) Coffey et al. (2010) Masuda & Tully (2012)
Hopelessness Depression Symptom Questionnaire (Metalsky & Joiner, 1997)	.93	-	Zhou et al. (2013)
Self-rating Depression Scale (Zung, 1965)	-	.85	Daikubara et al. (2013) Murayama & Okayasu (2013)
Penn State Worry Questionnaire (Meyer et al., 1990)	.88	.79	Vand et al. (2014)
Eating Disorder Examination Questionnaire (Mond et al., 2006)	.84 - .85	.81	Calogero & Pina (2011)
Three Dichotomous Items (Rost et al., 1993)	-	-	Su & Chen (2015)
Posttraumatic Diagnostic Scale (Foa et al., 1997)	.92	.83	Su & Chen (2015)
Hopkins Symptom Checklist-21-item version (Green et al., 1988)	.90	-	Wong et al. (2014)
Patient Health Questionnaire-9 Scale (Kroenke et al., 2001)	.89	-	Chen et al. (2014)
Generalized Anxiety Disorder 7-item (Spitzer et al., 2006)	.92	.83	Chen et al. (2014)
General Health Questionnaire (subscale; Depression) (Goldberg, 1978)	.70 - .90	-	Higata & Saito (2007) Ranjbar et al. (2013) Sasaki & Yamasaki (2005)
SCL-90 Symptom checklist (Derogatis, 1994)	.62 - .96	-	Luo & Wang (2009)

Table 2 (continued)

Measure	Psychometrics		Studies
	α	r_{xx}	
Psychological symptoms			
State-Trait Anxiety Inventory (subscale; Trait scale) (Spielberger et al., 1970)	.92	-	Griva & Anagnostopoulos (2010)
Personality Assessment Inventory (subscale; Anxiety) (Morey, 1991)	.90	-	Hovey & Seligman (2007)
Scale for Measuring Depression and Anxiety (Costello & Comrey, 1967)	.74	-	Khan et al. (2016)
Quality of life			
World Health Organization Quality of Life-BREF (Skevington et al., 2004)	.68 - .82	-	Deng et al. (2011) Woodruff et al. (2013)
Well-being			
Subjective Well-Being (Diener, 1984)	.90	-	Shapiro et al. (2011)
Scale of Psychological Well-Being (Ryff, 1989)	.86 - .93	.81 - .85	Bowlin & Baer (2012) Iwasaki (2003)
Medical Outcomes Study Short Form Sruvey (subscale; Emotional well-being) (Ware & Sherbourne, 1992)	.80	-	Bodenlos et al. (2015)
Warwick-Edinburgh Mental Well-being Scale (Tennant et al., 2007)	.89 - .91	.83	Jayalakshmi & Magdalin (2015)
Mental Health Inventory (subscale; psychological well-being) (Veit & Ware, 1983)	.81 - .96	-	Kim et al. (2015)
General Health			
General Health Questionnaire (Goldberg, 1978)	.70 - .90	-	Costa et al. (2013) Kitami & Mori (2010) Koesten et al. (2009) Masuda et al. (2009) Masuda et al. (2010) Masuda & Tully (2012) Masuda & Wendell (2010) Ranjbar et al. (2013) Sezai et al. (2015)
Subjective Well-Being Inventory (Sell, 1994)	.60 - .88	-	Daikubara et al. (2013)
Mental Health Inventory (MHI; Veit and Ware, 1983)	.81 - .96	-	Iwasaki (2003)

Table 3 Estimated associations between cognitive behavioral factors and mental health

Mental health factor	Attention			Memory			Thought			Behavior		
	Estimate [95%CI]	Studies	Sample size (n)	I^2 (%)	Estimate [95%CI]	Studies	Sample size (n)	I^2 (%)	Estimate [95%CI]	Studies	Sample size (n)	I^2 (%)
Negative affect	-.39 [-.47, -.31]	6	5,275	84.5	-	0	-	-	.46 [.35, .58]	7	9,696	94.7
Positive affect	.23 [.15, .31]	2	557	0.0	-	0	-	-	-	0	-	-
Happiness	.28 [.15, .41]	4	19,111	96.9	-	0	-	-	-.41 [-.70, -.11]	3	2,993	98.4
Social function	-	1	1,860	-	-	1	104	-	-	0	-	-
Stress response	-.35 [-.45, -.25]	5	3,684	80.9	-	0	-	-	.39 [.26, .53]	4	2,930	84.9
Psychological symptom	-.34 [-.43, -.24]	9	7,426	91.9	-	1	104	-	.41 [.30, .51]	17	9,556	95.9
Quality of life	.32 [.23, .40]	2	557	0.0	-	0	-	-	-	0	-	-
Well-being	.39 [.31, .47]	3	3,292	69.5	-	0	-	-	-	0	-	-
General health	.32 [.17, .48]	4	3,042	90.9	-	0	-	-	-.37 [-.44, -.29]	5	3,284	72.9
Overall	.34 [.30, .38] (.32 [.28, .36]) ^a	36	44,804	92.1	-	2	208	-	.41 [.35, .47]	36	28,459	95.8

Note . ^a Based on Trim and Fill method

Note. Black circles: included studies, White circles: added possible missing studies using Trim and Fill methods.

Figure 2 Funnel plot of the relationship between attention and mental health