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The Effects of Cognitive Behavioural Therapy and Yoga on Stress

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Abstract. This study compares a stress management program based on cognitive behavioural therapy principles with yoga-based stress management program. A study sample of 30 students, 15 male and 15 female from one of the local university in Sabah, was taken as subjects. The subjects were divided into 3 equal groups. The first group was given cognitive behavioural therapy, the second group was given yoga and the last group treated as control group. Trained group leaders were instructed the first and second groups, and 10 sessions were held with each group, over a period of 4 months. Psychological (self-rated stress, anger, exhaustion and quality of life) measurements were obtained before and after treatment with questionnaire. The results indicate that cognitive behaviour therapy is a promising stress management technique compared to yoga therapy and the control group. However, both interventions do not have any significant effects on quality of life.

Keywords: stress management, cognitive behavioural therapy, yoga

Abstrak. Makalah ini mengkaji perbandingan antara suatu program pengelolaan stres berlandaskan prinsip-prinsip terapi perilaku kognitif dengan suatu program untuk mengatasi stres yang menggunakan terapi yoga. Sampel berasal dari 30 mahasiswa suatu universitas di Sabah, yang terdiri atas 15 pria dan 15 wanita. Subjek dibagi menjadi tiga kelompok yang sama besarnya. Kelompok pertama menerima terapi perilaku kognitif, kelompok kedua menerima terapi yoga, sedangkan kelompok terakhir menjadi kelompok kontrol. Instruktur-terlatih memberikan terapi kepada kelompok pertama dan kedua dalam 10 sesi untuk setiap kelompok selama empat bulan. Pengukuran psikologis terhadap tingkat stres, kemarahan, kelelahan, dan kualitas hidup dilakukan sebelum dan sesudah perlakuan dengan memakai kuesioner. Hasil studi menunjukkan bahwa terapi perilaku kognitif merupakan teknik pengelolaan stres yang menjanjikan jika dibandingkan dengan terapi yoga dan kelompok kontrol yang tidak diberi perlakuan. Meskipun demikian, kedua intervensi tersebut tidak menunjukkan dampak yang signifikan terhadap kualitas hidup.

Kata kunci: pengelolaan stres, terapi perilaku kognitif, yoga

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University students face numerous potential stresses and strains. In addition to meeting academic expectations and coping with the many life changes, which typically mark the transition from adolescence to adulthood, the strains that university students currently face may be different and/or more frequent than in previous generations. For example, rising tuition costs may be a source of additional stress (European Commission, 2000). Evidence also suggests that the number of diverse life choices that exist during the transition from adolescence to adulthood in modern

society has resulted in the achievement of adult independence being more complicated than ever (Lerner, Brown & Kier, 2002). As well, the prospects for finding a job at the end of an academic endeavour may be less certain compared to previous generations of students. This is due to very competitive job market, where only the best performers can survive (Van der Klink, Blonk, & Van Dijk, 2001).

Certainly, the pressure to gain any type of university education is more profound than it has ever been. The emergence of relatively new health concerns such as AIDS and other sexually transmitted infections such as gonorrhoea, syphilis, and herpes also present new challenges to university students. Limited evidence does suggest an increase over the last decade in reported cases of stress related emotional problems (Stone & Archer, 1990), and psychopathologies among university students.

In addition to an apparent increase in frequency of stress-related problems, university health officials also believe that mental health problems among students may be becoming more severe (Thorne, 1995). That is, in addition to the minor stresses during the exam period, students are experiencing stress over issues such as finances, unwanted pregnancies, eating disorders, sexually transmitted infections (STIs), career uncertainties, relationship difficulties, and suicidal ideation. As a specific example, the University of Western Ontario reports several first time cases of schizophrenia and several patients presenting with depression of varying severity (Thorne, 1995).

Stress-related health problems, such as chronic fatigue, muscular pain and burnout, have increased dramatically in modern societies in recent years (European Commission, 2000). A variety of stress-management techniques is used to address this problem. In a meta-analysis of occupational stress-reducing interventions, van der Klink and colleaguees (2001) distinguished 4 intervention types: cognitive-behavioural interventions, relaxation techniques, multimodal programs, and organization-focused interventions. They concluded that all of the intervention types were effective, but cognitive-behavioural interventions were more effective than the other types. In a review of work-site stress management interventions, including muscle relaxation, meditation, biofeedback, cognitive-behavioural skills and combinations of these techniques, Murphy (1996) concluded that the effectiveness of the interventions varied according to the health-outcome measure used. Cognitive-behavioural skills were more effective for psychological outcomes, whereas muscle relaxation techniques were more effective for physiological outcomes. Using a combination of techniques (e.g. muscle relaxation plus cognitive-behavioural skills) seemed to be more effective across outcome measures than using a single technique. A similar recommendation is given by Jones and Johnston (2000), who concludes that a stress management intervention should include psycho-education and analyses of individual reaction in combination with management techniques, such as relaxation, assertiveness training, time management and cognitive restructuring.

Another method, which is very popular among students to overcome stress, is yoga (Satsvarupa, 1977). Dating back over 5,000 years, yoga is the oldest defined practice of self development, which also includes stress management. The methods of classical Yoga include ethical disciplines, physical postures, breathing control and meditation. Yoga practice focuses on breathing and physical exercises, thereby combining muscle relaxation, meditation and physical workout. Yoga derives its name from the word, *yoke*—to bring together—does just that, bringing together the mind, body and spirit. Whether yoga is used for spiritual transformation or for stress management and physical well-being, the benefits are numerous (Satsvarupa, 1977).

Yoga is also intimately connected to the religious beliefs and practices of the Indian religions. Outside India, yoga is mostly associated with the practice of postures (*asanas*) of *Hatha Yoga* or as a form of exercise, although it has influenced other spiritual practices throughout the world (Rama, 2008). Besides *Hatha Yoga*, other branches of Yoga include *Jnana Yoga* (yoga of knowledge), *Karma Yoga* (yoga of work) and *Bhakti Yoga* (yoga of devotion).

There is a plethora of yoga schools. One of the most common is *Kundaliniyoga*, which is characterized by exercises (*kriya*s) that stimulate the blood flow and energy supply to the brain, the nervous system and the glands in the endocrine nervous system (Singh-Khalsa, 1998).

Although there is a lack of controlled studies, yoga is regarded as a promising method for the treatment of stress-related problems (Fersling, 1997). Several studies have shown yoga to be promising

for both physiological (Murugesan, Govindarajulu, & Bera, 2000) and psychological outcome measures (Malathi, Damodaran, Shah, Patil, & Maratha, 2000).

In the present randomized study, two active methods for stress management, cognitive behaviour therapy and *Kundaliniyoga*, are compared. It is hypothesized that both methods have positive effects on perceived stress, stress behaviour, vital exhausttion, anger and quality of life, but that cognitive behaviour therapy and yoga have different impacts on various outcome measures.

Method

Design

Following recruitment and informed consent and before assessment, whereby student assessments conducted prior to the intervention, the participants were assigned randomly to three conditions: cognitive behaviour therapy, yoga, and control group, in 10 participants on each group. Participants also divided to five females and five males for each groups. Data were collected pre- and post-treatment. Each group also has multi-ethnic. About 100 student were measured their stress level with Perceived Stress Scale (PSS). Thirty students who have moderate to high level of stress were taken as subjects to see the solely on effects of intervention on stress management (Cohen, 1992).

Participants

Participants were recruited from School of Psychology, Universiti Malaysia Sabah (UMS). All personnel received information about the design of the project and the two methods, and were invited to participate in the project. Participation in the study was free of charge. It was emphasized that there was no opportunity to choose between the two methods, and the participants were requested not to share information about the specific content of the methods with each other during treatment. Thirty students agreed to participate in the study.

Of the 30 participants, 10 were on the cognitive behaviour therapy program, 10 were on the yoga program, and 10 were on the control group without any manipulation. All participants completed the questionnaires. The main characteristics of the participants are presented in Table 1.

Procedure

The 10 sessions in each program ranged over a 4-month period. There was a difference in preferences with regard to the scheduling of the sessions. Yoga was held weekly (with 1 week's interruption between sessions 6 and 7 due to the school vacation), whereas cognitive behaviour therapy was initially held weekly (first 4 weeks), followed by 3 sessions held once every other week, and finally by 3 sessions once every 3 weeks. In order to end the two training programs at approximately the same time, the yoga groups started a few weeks later than the cognitive behaviour therapy groups. There is one instructor for the cognitive behaviour therapy group and another instructor for yoga group. The cognitive behaviour therapy sessions were performed at the university premises, and the yoga sessions at locations nearby. Measurements for all participants were taken two weeks prior to the first cognitive behaviour therapy group session and two weeks after the final group sessions. Measurements took place in a room at the university premises. Upon arrival for the measurements, the participants returned a questionnaire that they had completed.

Intervention programs

Each session in the cognitive behaviour therapy program was divided into 5 sections: relaxation, discussion on home assignments, psycho-education, management techniques, and introduction of new home assignments. For relaxation, the principles of "Applied relaxation" (Öst, 1987) were used. The homework assignments followed the same basic structure, including 4 parts: registration tasks (e.g. stress behaviour, anger and irritation, problems, etc.), daily drills (training new management techniques, such as listening without interrupting, eating slowly, etc.), case studies, and relaxation training. The psycho-education section consisted in the presentation of stress-related topics, such as the psychophysiology of stress, theoretical stress models, time urgency, irritation, and anger. The management methods employed concerned problem-solving, assertiveness training, goal setting, time management, cognitive and behavioural restructuring, and relapse

prevention. To ensure a high degree of control over the content of the sessions, they followed a pre-set manual (including a written manuscript). Each session was followed by a meeting in which group leaders evaluated the content of the session.

The main focus of the yoga program was on physical exercise. Sessions 1–3 had their origin in a yoga program designed for back treatment. In sessions 4–6 a program involving basic movements, normally used as an introduction to *Kundaliniyoga*, was implemented. Sessions 7–9 were aimed at balancing body, energy and mind. The final session involved exercises that can be used daily to alleviate tension in the shoulders, neck and head, or when some extra energy is needed. At each session, participants were given a compendium that contained a theoretical account of a specific theme, and advice, suggestions and yoga exercises relevant to that theme. Each session included a 15 minute discussion of different topics, such as life behaviours, restoration, reflection, self-respect, physical exercise and food/eating habits. The yoga participants also received home assignments, which involved physical exercises and reading through the compendium in question. Various themes were presented, including personal goals, breathing, body postures, meditation and mantra knowledge and intuition. To ensure that the two treatments differed, both were manual-based. Group leaders were informed of the necessity of closely following the manuals.

Questionnaires

Five scales covering different aspects of stress were used for the outcome measures. The first dependent measure, for general stress level, is "Perceived Stress Scale" (PSS) (Cohen, Kamarck, & Mermelstein, 1983; Eskin & Parr, 1996). The PSS is a 14-item scale designed to measure the degree to which life situations are appraised as stressful. Respondents are asked to indicate how often they have felt or thought a certain way in the past month (e.g., "In the last month, how often have you been upset because of something that happened unexpectedly?") on a 5-point scale that ranges from 0 (*never*) to 4 (*very often*). Responses are then summed to indicate the level of perceived (subjective) stress. The PSS has demonstrated adequate internal and test–retest reliability (Cohen et al., 1983). The internal consistency reliability is 0.82 (Cronbach's alpha). The second dependent is "Maastricht Questionnaire" (Meesters & Appels, 1996), which measures exhaustion (reliability is 0.78). The scale, consisting of 19 items, was designed to measure the degree of vital exhaustion. As a third dependent measure, the MMPI-2 Anger Sub-scale was used (Graham, 1990) with its internal consistency reliability is 0.80. The original 15-item scale was transformed into a 14-item scale, with 1 item removed from statistical analysis. This is due to participant did not clearly understand the item. The fifth dependent measure was quality of life, which was measured using the Quality of Life Inventory (QOLI) (Frisch, Cornell, Villanueva, & Retzlaff, 1992), with its reliability is 0.79. The QOLI consists of questions of importance and satisfaction regarding 16 areas in life (in total 32 items). All items except those on the ''Quality of Life Inventory'' were presented with 5 response categories, regardless of the original number. All the questionnaires have good reliability and validity to measure what suppose to be measured.

Statistical analysis

SPSS version 14.0 was used for the statistical analysis. Analysis of Variance (ANOVA) was used to measures the difference of stress level in pre-test. Repeated t-test was used to measure the differences between stress level in pre- and post-treatment. ANOVA one way is employed to measure the difference of stress level after the intervention (post-test). The results of ANOVA show that there is no significance of effects of ethnic, gender, age, and type of personality on stress.

Results

Descriptive analysis

Table 1 shows the demographic factor which involves in the research. The mean of the age group is 22.6, there are three ethnic groups there are Malay (45.8%), Chinese (22.5%) and Indian (31.7). All of the sample are single (100 %) and they come from various faculty in the University.

Table 2 shows the results of mean and standard

Table 1
Background Characteristics

Variable	%
Age	
22	50.0
23	50.0
Ethnic	
Malay	45.8
Chinese	22.5
Indian	31.7
Gender	
Male	15 (50%)
Female	15 (50%)
College	
Arts + science	10 (33.3%)
Commerce	10 (33.3%)
Education	10 (33.3%)
Marital Status	
Single	30 (100%)

deviation for the three groups that are cognitive behaviour therapy, yoga, and control groups.

Table 3 shows the results of ANOVA for the differences between stress levels prior to the experiment. There are no significant differences between stress, exhaustion, anger and quality of life between groups. The result indicates that all the groups have similar level of stress.

Table 4 shows the result of t-test to compare the pre- and post-experiment scores for the cognitive behavioural therapy group. Significantly lower scores of stress, exhaustion and anger were observed after the experiment. These facts indicate that cognitive behavioural therapy has significant effects on perceived stress, exhaustion and anger.

Table 5 shows the results of repeated t-test to compare the pre- and post- experiment scores for the yoga group. Stress and exhaustion scores were found to be significantly lower after the experiment, pointing to the impact of Yoga.

Table 6 shows the results of repeated t-tests to compare pre- and post-experiment scores in the control group. No significant differences were found.

Table 7 shows the result of an ANOVA to compare the post-experiment scores of the three groups. There were significant differences in stress, exhaustion, and anger scores between the three groups.

Table 8 shows the result of post-hoc for the differences among the groups for each psychological condition after the intervention. There are significant differences on group cognitive behavioural therapy compared to yoga group and control group.

Discussion

This section provides a discussion on the effects of cognitive behavioural therapy, yoga on stress management among the student in local university. In order to provide context, some additional findings from the larger needs assessment will be incorporated into the discussion. Study implications and recommendations for future research are also presented.

Table 2
The Mean and Standard Deviation of Pre- and Post-Test Scores

Variables		Group CBT M	Group CBT SD	Group Yoga M	Group Yoga SD	Group Control M	Group Control SD
Stress	Pre	2.19	0.40	2.06	0.48	2.06	0.48
	Post	1.54	0.51	1.67	0.47	2.34	0.50
Exhaustion	Pre	1.85	1.28	1.82	0.74	1.82	0.74
	Post	1.28	0.68	1.25	0.56	1.92	0.80
Anger	Pre	1.15	0.46	1.23	0.51	1.23	0.51
	Post	0.81	0.81	1.23	0.51	1.96	0.69
Quality of life	Pre	1.95	0.92	2.21	1.32	2.45	1.32
	Post	2.46	1.34	2.21	1.32	2.67	1.37

Table 3
ANOVA Shows Differences Between Stress Levels on Pre Experiment

Variables		Sum of Squares	*Df*	Mean of Squares	*F*
Stress	Between groups	0.35	2	0.17	0.38
	Within groups	53.57	27	0.45	
	Total	53.92	29		
Exhaustion	Between groups	0.22	2	0.11	0.18
	Within groups	50.22	27	0.23	
	Total	50.22	29		
Anger	Between groups	0.16	2	0.15	0.22
	Within groups	45.00	27	0.12	
	Total	45.16	29		
Quality of life	Between groups	0.35	2	0.16	0.23
	Within groups	50.00	27	0.23	
	Total	50.35	29	29	

*$p = 0.05$

Table 4
T- test Results for the Differences Between Stressp Levels on Pre- and Post- Experiment Cognitive Behavioural Therapy Group

Variables		*M*	*SD*	*t*	*Sig.*
Stress	Pre	2.19	0.40	1.42*	0.00
	Post	1.54	0.51		
Exhaustion	Pre	1.85	1.28	0.88*	0.00
	Post	1.28	0.68		
Anger	Pre	1.15	0.46	0.45*	0.00
	Post	0.81	0.81		
Quality of life	Pre	1.95	0.92	-0.44	
	Post	2.46	1.34		

*$p < 0.05$

The Effects of Cognitive Behaviour Therapy Intervention

From the results, the intervention on cognitive behaviour therapy was found to significantly contribute to reduce of stress level among the students. The results indicate a reduced of perceived stress (mean from 2.19 in pre-test to 1.54 after the intervention). The intervention on cognitive behaviour also can reduce the exhaustion (mean from 1.15 to 0.81) and the anger (mean from 1.85 to 1.28). These findings is consistent with previous research conducted by Leaf (1987) shows that the cognitive behaviour therapy as intervention help student to significantly decrease stress among students compared to yoga and no intervention. This could be because students with cognitive behaviour therapy could manage the stress better after their intervention. Although a firm conclusion cannot be taken but the intervention could help the student to manage the stress compared to yoga and no intervention.

This result also supports Lundberg (2000), who shows approaches to stress management on mental and behaviour can reduce students stress level. This result also shows the cognitive behaviour intervention helps the students to become more aware about the stress level compared to yoga and no intervention. According to Murphy (1996), cognitive

Table 5
T- test Results for the Differences between Stress on Pre- and Post- Experiment Yoga Group

Variables		*M*	*SD*	*t*	*Sig.*
Stress	Pre	2.06	0.48	0.82*	0.00
	Post	1.67	0.47		
Exhaustion	Pre	1.82	0.74	0.87*	0.00
	Post	1.25	0.56		
Anger	Pre	1.23	0.51	0.57	
	Post	0.96	0.44		
Quality of life	Pre	2.21	1.32	-0.19	
	Post	2.46	1.37		

Table 6
T- test Results for the Differences Between Stresses on Pre- and Post- Experiment Control Group

Variables		*M*	*SD*	*t*	*Sig.*
Stress	Pre	2.06	0.48	0.23	
	Post	2.34	0.50		
Exhaustion	Pre	1.82	0.74	-0.12	
	Post	1.92	0.80		
Anger	Pre	1.23	0.51	0.22	
	Post	1.96	0.69		
Quality of life	Pre	2.45	1.32	-0.19	
	Post	2.67	1.37		

*$p < 0.05$

behaviour therapy could help student to control on anger and exhaustion. Specific contribution of cognitive behaviour therapy is mental relaxation, whereas the specific contribution of yoga is physical relaxation (Lundberg, 2000).

This finding also indicate the right intervention such as cognitive behaviour therapy could help student to manage their anger, exhaustion, and perceived stress compared to yoga and no treatment group. This is because student with many problems especially with their heavy workload need a method to control their mental and emotion problems. With the cognitive behaviour therapy student could manage their stress better. It is similar to the results from Jones and Johnston (2000).

Although university students generally rate themselves as physically healthy and are less likely to have physical health issues because of their younger age, the recently published Statistical Report on the Health of Malaysia states that "unhappiness, stress, and depression are now conditions of youth much more than old age". The report, which is based on data obtained from the *National Population Health Survey*, presents evidence of declining psychological health in Malaysian aged 18-24 years, measured in terms of sense of coherence, self-esteem and mastery (Nor, 2000). This shows that right intervention should be given to student to overcome their stress level to become severe and depression.

Limitation of the Study and Recommendations for Future Research

Several limitations to the present study must be noted. The Hawthorne effect might present, whereby subjects showed the improvement of their psychological aspects, simply in response to the fact that they were being studies and not in response to cognitive behaviour or yoga therapies.

Other than that, the dependent variable question

Table 7
ANOVA Results for the Differences Between Stress Levels After Intervention

Variables		Sum of Squares	*Df*	Mean of Squares	*F*
Stress	Between groups	0.44	2	0.18	11.23*
	Within groups	54.55	27	0.45	
	Total	54.99	29		
Exhaustion	Between groups	0.34	2	0.16	10.23*
	Within groups	53.22	27	0.22	
	Total	55.56	29		
Anger	Between groups	0.34	2	0.15	6.22*
	Within groups	44.00	27	0.12	
	Total	44.34	29		
Quality of life	Between groups	0.15	2	0.16	0.34
	Within groups	50.00	27	0.23	
	Total	50.15	29		

* $p < 0.05$

Table 8
Post Hoc Test for the Differences on Stress Level Among the Groups After Intervention

Group	1	2	3
1		*	*
2	-		-
3	-	-	

*$p < 0.05$

Table 9
Post Hoc Test for the Differences on Exhaustion Level Among the Groups After Intervention

Group	1	2	3
1		*	*
2	-		-
3	-	-	

*$p < 0.05$

Other than that, the dependent variable question asked about stress or emotional issues, which may be interpreted in a variety of different ways. The manner in which the question was asked may not have captured those students who did not perceive certain problems as emotional or stress related. An example of this would be a student who was having stress-related tension headaches, and who perceived this problem as physical, rather than psychosomatic in nature. As a result of classifying their headaches as purely physical, they would not have indicated talking to a health professional regarding a mental health or emotional issue.

This may have resulted in the proportion of students who had discussed a mental/emotional issue being underestimated. Also related to the dependant variable, the issue of severity was not addressed. The author acknowledges that mental health problems range in severity, and that the severity experienced by the student will influence their choice to seek help. Future studies may benefit from capturing the concept severity by measuring the use of services as a continuous variable, or by using other data sources and statistical techniques to analyze the influence of severity. A completely random sample was not possible due to budget constraints. Instead, a convenience sample based on a random list of classrooms was used to obtain participants. Participation was ultimately dependent upon professors' consent and the willingness of students. To ensure true representation from the university student population, future research would benefit from using a random sampling strategy and including students from numerous universities.

The cross-sectional nature of the study is a third

limitation. This type of design captures static information from a single cohort of students, and therefore, may not represent other university students in another time. In the future, a longitudinal design would better address the possibility of changing predictors of intervention for stress management.

A fourth limitation is the reliance on self-report data. Although problems validating the accuracy of self-reported information regarding utilization of services have been noted (Stone & Archer, 1990) the difference between self-reported and actual utilization is reported to be very small, particularly if the participants are younger and relatively infrequent users of service (Andersen & Newman, 1973). To lessen the likelihood of recall errors, a time frame of one year was selected for the question related to services use. Nevertheless, future studies might consider using data from other sources, such as medical records. The survey used was designed primarily for a broad-based needs assessment and therefore covered topics outside the scope of this study. The length of the questionnaire needed to be kept short enough so as to not discourage students from participating. Consequently, information on many additional correlates of stress management was not collected.

Conclusions and Practical Applications

University students are a unique population in many respects. They have a demographic structure that is different from the general population, and face many different types of mental health challenges. The results of this study identified cognitive behaviour therapy could help the student to control and manage the anger, perceived stress and exhaustion.

This study will assist health service providers that work with the university population to better understand the decision making process that takes place when a student experiences mental health challenges. A unique student model will also help to guide professionals in designing their outreach strategies and health education campaigns. In order to maximize the value and success of such programs, the services offered by universities need to be as specific as possible to their target population. The development of the intervention in this study can be viewed as a first step towards achieving the goals set out by health professionals that serve the university student community.

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