

ORIGINAL ARTICLE

The Effects of a One-day Mindfulness-based Intervention on Psychological Distress for Caregivers of Children with Speech-language Pathology: A Pilot Randomized Control Trial

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ABSTRACT

Introduction: Caregivers of children with speech-language pathology experience psychological distress as speech impedes communication and interferes children's development. This study aimed to determine the effects of a one-day mindfulness-based intervention (MBI) in reducing depression, anxiety, and stress for caregivers of children with speech-language pathology in a Malaysian hospital. **Methods:** Caregivers ($n = 62$) who fulfilled the selection criteria were recruited and randomly assigned to either MBI or treatment-as-usual control groups. The caregivers completed self-rated questionnaires, namely the Depression Anxiety Stress Scale 21 (DASS 21) and Mindful Attention Awareness Scale (MAAS) before and at one-month post-intervention. **Results:** Hierarchical multiple regression analyses demonstrated significant improvement in DASS 21 and MAAS scores in the intervention group compared to control group. There were significant improvements at one-month post-intervention in all outcome measures: depression ($\beta = 4.20$, $\Delta R^2 = 0.09$, $p = 0.008$, $f^2 = 0.10$); anxiety ($\beta = 5.12$, $\Delta R^2 = 0.13$, $p = 0.001$, $f^2 = 0.15$); stress ($\beta = 5.36$, $\Delta R^2 = 0.14$, $p < 0.001$, $f^2 = 0.16$); mindfulness ($\beta = -5.89$, $\Delta R^2 = 0.05$, $p = 0.022$, $f^2 = 0.05$). Medium effect sizes were observed in anxiety and stress symptoms reduction. **Conclusion:** The one-day MBI was effective in reducing psychological distress for caregivers of children with speech-language pathology.

Keywords: Anxiety, Caregivers, Depression, Mindfulness, Stress

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INTRODUCTION

Child speech-language pathology is defined as the failure of a child to meet the appropriate speech and language milestones (1) which includes stuttering, impaired articulation, a language impairment, or a voice impairment that adversely affects a child's educational performance (2).

Caregivers play an essential role in facilitating language development in their developmentally delayed children (3). One of the main challenges faced was not being able to understand what the children wanted (4). Hence, the severity of speech impairment was highly associated with parental depressive symptoms (4–6) and the risk of anxiety as well as anger (5). Depression, anxiety, and stress symptoms are reported worldwide to be prevalent among caregivers of children with speech-language

pathology (7,8). A local study also found a high level of depression, anxiety, and stress among parents who have children with speech delay (9).

One of the promising interventions for reducing caregiver's psychological distress is mindfulness-based intervention (MBI) (10–21), such as mindful parenting. The concept of mindfulness emphasizes present-moment awareness, whereby a person purposefully pays attention to the present moment experience, in a particularly non-judgmental way (22). Likewise, mindful parenting refers to parents intentionally bring moment-to-moment awareness to the parent-child relationship (23). This is done by listening attentively, cultivating emotional awareness and self-regulation in parenting, having non-judgmental acceptance, and being compassionate to themselves and their children (23,24).

MBI had been shown to significantly reduce psychological distress among parents of children with chronic health conditions (11). Increased mindful attention had a mediating effect on the mental well-being of parents who have children with Autism Spectrum

Disorder (11–21). It was postulated that mindfulness improves mental wellbeing by increasing mindfulness trait, strengthening resiliency and improving coping skill in those chronically stressed caregivers (25,26).

In Malaysia, MBI was found to alleviate psychological distress and improve emotional well-being among medical students (27–30), critical care nurses (31) and palliative cancer patients (32). Despite the growing role of mindful parenting (23,24), studies focusing on mindfulness training for parents who are caregivers are relatively scarce (33,34).

Not much attention is given on psychological interventions to manage caregivers’ emotional health in Malaysia. In this study, we hypothesize that a one-day MBI has the effects of improving depression, anxiety, stress, and mindfulness levels among caregivers of children with speech-language pathology attending a speech clinic in Penang General Hospital, Malaysia.

MATERIALS AND METHODS

This study was approved by the Medical Research and Ethics Committee (MREC) NMRR-17-1687-36367 and Universiti Kebangsaan Malaysia (UKM) research ethics committee (JEP-2017-548). We conducted an open randomized control trial (RCT) study among caregivers of children with speech-language pathology who visited the speech clinic in Penang General Hospital, Malaysia.

Participants

Caregivers of children with speech-language pathology who visited the speech clinic in Penang General Hospital were conveniently sampled to participate in the study. Those who fulfilled inclusion criteria and consented were finally recruited into the study. Inclusion criteria for caregivers were at least 18 years old, lived with the children and provided unpaid care for the past 12 months or more, and had a good command of Malay and English language. A maximum of two caregivers per family was allowed to participate in this study. Inclusion criteria for children include those with speech-language pathology, aged below 18 years old, and attending speech clinic in Penang General Hospital, during the study period. The exclusion criteria were caregivers diagnosed with major psychiatric disorders such as anxiety disorder, major depressive disorder, obsessive-compulsive disorder, bipolar disorder, and schizophrenia, who were taking psychotropic medications, or were receiving any form of psychotherapy.

Measures

All participants were required to complete self-reported questionnaires i.e. socio-demographic questionnaire, Depression Anxiety Stress Scale 21 (DASS 21) and Mindful Attention Awareness Scale (MAAS), which were done at baseline (before intervention) and one month later. To reduce ascertainment bias in this study, all

assessments were done using questionnaires in secured envelopes for both groups. Figure 1 summarizes the flow of study.

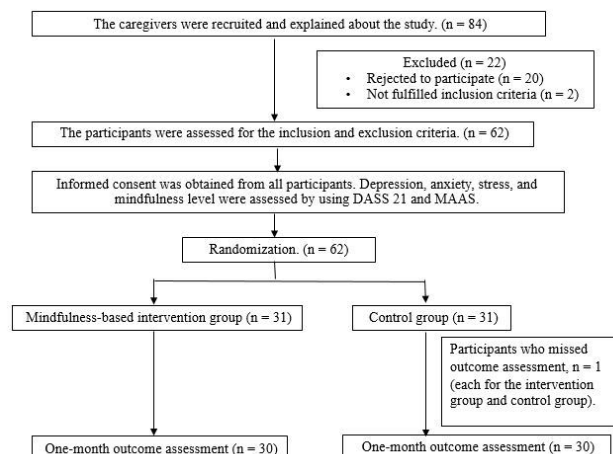


Figure 1: Flow of participants from screening to analysis

Depression Anxiety Stress Scale 21 (DASS 21)

DASS 21 is a self-rated instrument consists of three scales designed to measure negative emotional states, namely depression, anxiety and stress level (35). Each scale has seven items, ranging from zero (did not apply to me at all) to three marks (applied to me very much, or most of the time) for each item. Both Malay and English versions of DASS 21 were used in this study. DASS 21 English version is a public domain whereas permission to utilize the validated Malay version was obtained from the original authors (36). The validated Malay version of DASS 21 showed high reliability and construct validity for all domains, with reliability coefficient ranging from 0.82 to 0.90 (36–40). There are no cut-off points used but each domain score to the different levels of severity.

Mindful Attention Awareness Scale (MAAS)

This 15-items self-reported questionnaire evaluates the attention and awareness components of the mindfulness construct. The level of mindful attention was assessed using a Likert scale of one (almost always) to six (almost never), with total scores ranging from 15 to 90. Higher total scores indicate a higher level of mindfulness. It has been validated and shows good internal consistency which Cronbach alpha of 0.82 (41). Both Malay and English versions of MAAS were used in this study. The validated Malay version also has good internal consistency reliability with Cronbach alpha of 0.851(42). The English version of MAAS is a public domain and permission to use the Malay version was obtained (42).

Procedures

Randomization

Upon recruitment, participants were randomized into either the MBI or the control groups by using an online software RANDOM.ORG (43). The intervention group was given a one-day MBI while the control group received treatment-as-usual. The randomization was performed by research personnel who was not involved

in the study in order to diminish bias in group allocation.

Blinding

In this RCT, the mindfulness trainer and participants of the intervention were not blinded to both experimental groups. The control group participants were notified that the intervention will be scheduled at another time; one month later, which was after the study period.

Intervention group

The brief MBI was adapted with permission from the MINDFULGym program. The original program is a structured, 5-weekly, 2 hours per week, group MBI program, which had been proven scientifically to alleviate psychological distress in local nurses and medical students (27–31).

The brief intervention utilized in this study is a six hours session of MBI. It was conducted in English and Malay language. It was delivered by a final-year psychiatrist trainee who had attended the 5-week MINDFULGym program and received coaching from the developer of MINDFULGym. The intervention was conducted in a group and held in the hospital's seminar room. The one-day MBI started off with the introduction of the program followed by psychoeducation, practice sessions, group sharing, and discussion. The details of the mindfulness-based exercises introduced in the program can be found in the MINDFULGym workbook (44). The following is an outline of the program:

- ▶ Introduction to mindfulness (history, meaning, and benefits)
- ▶ Psychoeducation about stress, anxiety, and depression (S. A. D.)
- ▶ Mindful Body Stretching: This is an exercise for paying attention to the bodily sensations and relaxing muscular tensions.
- ▶ Mindful S. T. O. P. & Breathing: This is an acronym for a brief mindfulness practice designed to return a person's attention to the present moment within a minute, which is beneficial for busy caregivers. The four steps in Mindful S. T. O. P. are (a) S – Stop and invite attention to the present moment, (b) T – Take three slow, deep and mindful breaths, (c) O – Observe surrounding sounds, (d) P – Proceed with any activities mindfully and with a smile.
- ▶ Mindful Eating & Walking: These are exercises for appreciating and savoring the present moment experience.
- ▶ Gratitude Workout (Google-WWW-Yahoo): This is an exercise for cultivating mindful attention to the good things in parenting and caretaking.
- ▶ Mindful Parenting:
This is an important skill to foster everyday mindfulness into parenting (23,24). Mindful parenting extends the mindfulness concept to the parent-child relationship in the process of parenting. We also introduced the Mindful Parenting with the acronym "ABCDEF" which

consists of (a) A – Active mindful listening to your children using 'Mindful MIYAOW' (Mmmh, I see, Yes, Ahh, Ooh, Wow), (b) B – Bias: be mindful of your bias and judgmental attitude of self and the children, (c) C – Check in the feelings, which mean caregivers need to be aware of their own feelings and their child's feelings, (d) D – Don't react/panic: mindful parenting means low reactivity to challenges. It encourages caregivers to pause (Mindful S.T.O.P) and hold their unhelpful automatic reaction (e.g. yelling) before responding wisely to their children's behavior, (e) E – Exercise: the more we practice the mindfulness exercises (e.g. Google-WWW-Yahoo), the more effective we are in parenting, (f) F – Forgiving: the caregivers try to be forgiving, kind, and appreciative of oneself and their children.

Participants in this group were encouraged to practice and apply the mindfulness-based exercises taught in the program at home regularly during the one-month post-intervention. Adherence to intervention was enhanced by text messages reminders. There were no individual sessions or group meeting during the one-month post-intervention.

Control group

On the other hand, participants in the control group did not receive any intervention but continued treatment-as-usual. They were assessed similarly at baseline and one month later.

Sample size calculation

We computed an effect size Cohen's f^2 for sample size calculation. The average effect size (f^2) for the study measuring four outcomes similar to our study was 0.13 (approximately 0.15) by using hierarchical multiple regression (HMR) analysis (28). The sample size calculated was 58 based on the previous study (28), using the power of 80% and the significance level of 0.05. A total of 64 participants (32 participants per arm) were recruited taking into consideration a 10 % drop-out rate of previous studies (27–31). Due to the absence of interim assessments between pre-intervention and one-month post-intervention, we did not perform intent-to-treat analyses. All participants from both experimental groups were included in the analyses whereas participants who withdrew or did not turn up were considered as dropouts.

Statistical analysis

The sample was analyzed using SPSS version 20. Data were cleaned and explored. Numerical variables were presented using mean and standard deviation after normality assumption checking, while categorical variables were presented using frequency and percentage. Independent t-test, Pearson chi-square, and Fisher exact test were used for randomization checking. We analyzed the effect of experimental groups on all of the dependent outcome measures by using a series

of hierarchical multiple regression (HMR) of one-month post-intervention mean scores on baseline mean scores. We included the corresponding baseline mean scores in the first step of HMR and the one-month post-intervention mean scores served as dependent variables. The second step included the other pre-intervention scores, the third step for ASD diagnosis, and the final step was for the experimental groups (MBI and control groups). The statistical significance level was set at <0.05. Effect sizes of groups were measured by using Cohen's f^2 (f^2 near 0.02 = small; near 0.15 = medium; near 0.35 = large) (45).

RESULTS

A total of 84 caregivers were approached but only 62 participants consented to participate in the study. Twenty caregivers did not consent due to family commitment, inconvenient time and transportation problem. Two caregivers were excluded because they were suffering from major depressive disorder and undergoing treatment. All consented participants were randomized into MBI group (n = 31) and control group (n = 31). The drop-out rate was 3% from each of the intervention and control groups.

Table I shows the socio-demographic characteristics of the participants in the intervention and control groups. There was no significant difference in terms of socio-demographic characteristics between the groups. Participants in the intervention group were mainly middle-aged father, married and Buddhist. Furthermore, 58.1% were employed whereas 41.9% were unemployed. The mean age of their children was eight years old, and approximately 51.6% were diagnosed with Autism Spectrum Disorder (ASD). On the contrary, participants in the control group were mainly males (74.2%) with the mean age of 40 years old. All of them were married, and Muslims comprised a majority group (45.2%) among them. Most of the participants had secondary education (61.3%) and were employed (71.0%). The children's mean age was eight years old, and 64.5% had a diagnosis of Autism Spectrum Disorder (ASD).

The clinical characteristics (DASS 21 and MAAS scores) of the experimental groups were presented in Table I as well. There was no significant difference in the baseline depression, anxiety, and stress scores between the groups ($p > 0.05$). However, the baseline MAAS scores were significantly higher in the control group compared to the intervention group ($p = 0.014$).

The HMR analyses showed significant improvement in all DASS 21 domains (depression, anxiety and stress) and mindfulness level in intervention group compared to the control group (Table II). There were significant differences at one-month post-intervention in outcome measures: reduction in depression scores ($\beta = 4.20$, ΔR^2

Table I: Baseline socio-demographic and clinical characteristic of participants

Characteristic	Mean (SD) ^a / Frequency (%) ^b		p-value _{c, d, e}
	MBI group intervention n = 31	Control group n = 31	
Age (years) ^a	41.65 (7.61)	40.03 (7.93)	0.417 ^c
Gender ^b			
Female	20 (64.5)	23 (74.2)	0.409 ^d
Male	11 (35.5)	8 (25.8)	
Relation to the child ^b			
Father	20 (64.5)	23 (74.2)	0.409 ^d
Mother	11 (35.5)	8 (25.8)	
Child sex ^b			
Female	9 (29.0)	7 (22.6)	0.562 ^d
Male	22 (71.0)	24 (77.4)	
Child Age ^a	7.68 (4.17)	7.84 (3.28)	0.866 ^c
Child Diagnosis ^b			
ASD	16 (51.6)	20 (64.5)	0.303 ^d
Non-ASD	15 (48.4)	11 (35.5)	
Marital Status ^b			
Married	30 (96.8)	31 (100.0)	>0.950 ^e
Divorced	1 (3.2)	0 (0.0)	
Religion ^b			
Muslim	8 (25.8)	14 (45.2)	0.137 ^e
Buddhist	21 (67.7)	13 (41.9)	
Other	2 (6.5)	4 (12.9)	
Educational level ^b			
Primary school	2 (6.5)	1 (3.2)	0.375 ^e
Secondary school	12 (38.7)	19 (61.3)	
Diploma	5 (16.1)	4 (12.9)	
Tertiary study	12 (38.7)	7 (22.6)	
Employment Status ^b			
Employed	18 (58.1)	22 (71.0)	0.288 ^d
Unemployed	13 (41.9)	9 (29.0)	
DASS 21			
Stress	18.71 (9.86)	14.77(6.53)	0.070 ^c
Anxiety	11.29 (7.91)	9.35 (6.56)	0.298 ^c
Depression	10.13 (9.19)	8.26 (5.81)	0.342 ^c
MAAS	55.65 (15.61)	65.10 (13.57)	0.014 ^c

^a Mean(SD); ^b Frequency (%); ^c Independent T test; ^d Person Chi-Square; ^e Fisher Exact test; ASD = Autism Spectrum Disorder. DASS 21 = Depression, Anxiety, Stress Scale 21; MAAS = Mindful Attention Awareness Scales

Table II: Hierarchical multiple regression (HMR) analyses for the effects of experimental groups on change in outcome variables at one month after intervention adjusted for ASD

	MBI Group (n=30)		Control Group (n=30)		Adj. β (95% CI)	ΔR^2	P	f^2
	Pre Mean (SD)	One-month post mean (SD)	Pre Mean (SD)	One-month Post mean (SD)				
DASS 21								
De-pression	10.13 (9.19)	5.73 (6.19)	8.26 (5.81)	7.60 (7.02)	4.20 (1.14, 7.25)	0.09	0.008	0.10
Anxi-ety	11.29 (7.91)	7.20 (5.93)	9.35 (6.56)	9.67 (7.32)	5.12 (2.42, 7.82)	0.13	0.001	0.15
Stress	18.71 (9.86)	11.07 (7.62)	14.77 (6.53)	13.53 (5.91)	5.36 (2.74, 7.98)	0.14	<0.001	0.16
MASS	55.65 (15.61)	66.97 (12.13)	65.10 (13.57)	66.43 (12.20)	-5.89 (-10.89, -0.90)	0.05	0.022	0.05

MBI = Mindfulness-based intervention, DASS = Depression Anxiety Stress Scales 21, MAAS = Mindful Attention Awareness Scale
SD = Standard deviation
Adj. β = adjusted unstandardized coefficients,
 ΔR^2 = R square change, effect size (f^2 near 0.02 = small; near 0.15 = medium; near 0.35 = large)

= 0.09, $p = 0.008$, $f^2 = 0.10$); reduction in anxiety scores ($\beta = 5.12$, $\Delta R^2 = 0.13$, $p = 0.001$, $f^2 = 0.15$); reduction in stress scores ($\beta = 5.36$, $\Delta R^2 = 0.14$, $p < 0.001$, $f^2 = 0.16$); and increment in mindfulness scores ($\beta = -5.89$, $\Delta R^2 = 0.05$, $p = 0.022$, $f^2 = 0.05$). Medium effect size was observed in reduction of anxiety and stress scores ($f^2=0.15$ and 0.16 respectively).

Subgroup analyses for participants with ASD child ($n = 36$) showed significant differences at one-month post-intervention in three out of the four outcome measures: reduction in anxiety scores ($\beta = 5.20$, $\Delta R^2 = 0.13$, $p = 0.016$, $f^2 = 0.15$); reduction in stress scores ($\beta = 4.66$, $\Delta R^2 = 0.12$, $p = 0.007$, $f^2 = 0.14$); and increment in mindfulness scores ($\beta = -7.67$, $\Delta R^2 = 0.08$, $p = 0.029$, $f^2 = 0.09$) (Table III). Medium effect size was observed in reduction of anxiety and stress scores ($f^2=0.15$ and 0.14 respectively). Small effect size was observed in increment of mindfulness level ($f^2=0.09$). There was no significant differences at one-month post-intervention in depression scores ($\beta = 4.20$, $\Delta R^2 = 0.09$, $p = 0.053$, $f^2 = 0.10$).

Table III: Hierarchical multiple regression (HMR) analyses for the effects of experimental groups on change in outcome variables at one month after intervention in a subgroup of participants with ASD ($n = 36$)

	MBI Group (n=16)		Control Group (n=20)		Group Effect			
	Pre Mean (SD)	One-month post Mean (SD)	Pre Mean (SD)	One-month post Mean (SD)	Adj. β (95%CI)	ΔR^2	P	f^2
DASS								
De-pression	10.25 (9.43)	5.00 (5.89)	9.20 (5.89)	7.50 (7.16)	4.20 (-0.05, 8.45)	0.09	0.053	0.10
Anxiety	11.50 (9.40)	6.63 (5.50)	9.80 (6.89)	9.40 (7.90)	5.20 (1.02, 9.37)	0.13	0.016	0.15
Stress	19.00 (10.71)	11.38 (8.22)	15.80 (5.23)	13.50 (4.35)	4.66 (1.35, 7.98)	0.12	0.007	0.14
MAAS	56.19 (15.64)	67.88 (11.32)	64.85 (14.36)	65.90 (13.87)	-7.67 (-14.49, -0.86)	0.08	0.029	0.09

Final Hierarchical Model: Dependent variable = baseline depression + baseline anxiety + baseline stress + baseline MAAS + Group
 MBI = Mindfulness-based intervention, DASS = Depression Anxiety Stress Scales 21, MAAS = Mindful Attention Awareness Scale
 SD = Standard deviation
 Adj. β = adjusted unstandardized coefficients,
 ΔR^2 = R square change, effect size (f^2 near 0.02 = small; near 0.15 = medium; near 0.35 = large)

DISCUSSION

Before the intervention, in keeping with previous findings (9), we found a high level of psychological distress (mean depression score of 9.20, mean anxiety score of 10.33, mean stress score of 16.74) among caregivers of children with speech-language pathology. Our study findings showed a higher level of psychological distress when compared to a local cross-sectional study which reported mean depression score of 3.18, mean anxiety score of 3.29, and mean stress score of 4.98

based on DASS 21 (46). This could be due to caregivers experiencing more psychological distress were attracted to participate in this intervention study.

More importantly, our findings suggested the potential effects of a brief MBI in improving psychological distress namely depression, anxiety, and stress symptoms. Being the first study of its kind in South East Asia, our results showed a significant improvement at one-month post-intervention in all outcome measures of depression, anxiety, stress, and mindfulness. Our study also demonstrated medium effect sizes of improvement in anxiety and stress symptoms.

The studies describing the positive results of MBI for caregivers of children with disabilities are not entirely new. However, most previous studies (11–21) were limited to developed countries and a longer duration of intervention (five to 20 weeks). A similar 5-week MBI among caregivers of children with ASD in Jordan (a developing country like Malaysia) reported significant improvement in depression, anxiety, and stress symptoms but revealed medium to large effect sizes (47), compared to our findings which only showed medium effect sizes in anxiety and stress symptoms reduction. These could be attributed to the longer duration (i.e. five weeks) of MBI in the Jordan study and difference in the timing of post-intervention outcome assessments.

Considering the findings, a brief, one-day (six hours) MBI is a promising intervention for the local caregivers. In a developing nation like Malaysia, many parents are busy working to meet their needs and have difficulties to spend time on individual psychological therapy. Hence, a brief group intervention would be a more practical means to reduce psychological distress among busy caregivers. A previous study focusing on a brief MBI of a 90-minute one-to-one training course subsequently followed up by two phone calls reported improvement in anxiety, perceived stress, and mindfulness levels (48). Another study on a brief online mindfulness training also reported significant improvement in mindful attention after three one-hour Mindfulness-Based Stress Reduction (MBSR-based) online training modules (49).

It is also interesting to note that the benefits of the one-day MBI in our study were sustainable for one-month post-intervention. Although our study did not measure the longer-term effects of the brief intervention, caregivers practicing mindfulness periodically may be able to sustain the benefits. Mindfulness is an intervention which requires persistent practice to achieve the prolonged effect. A previous study reported that regular mindfulness practice can reduce caregivers' stress level up to 48 weeks post-intervention (19).

This study protocol describes the first RCT of a MBI conducted on caregivers of children with speech-language pathology in Malaysia. The brief MBI was

cost-effective as it was a group-based intervention. Moreover, a single therapist could deliver MBI to multiple participants at the same time. Similar to other studies, this study had a few limitations. This is a pilot study conducted in a local state hospital. Due to limited resources, small sample size was used, and the result could not be generalized to the Malaysian population. The heterogeneity of the diagnoses and severity of children's speech-language pathology which were not measured might have confounded the outcomes of the study. Upcoming research is required to determine the effects of this intervention for caregivers of specific subgroups of children with speech-language pathology (e.g. autism spectrum disorder).

Adherence to mindfulness practice at home may impair the effects of the MBI but was not measured in our study. Our study tried to increase adherence to mindfulness practice via phone short message service (WhatsApp) reminders. However, the adherence level or duration of mindfulness practice was not assessed in this study. The adherence issue is expected in an intervention study without a booster session. There was a difference in baseline scores of the Mindful Attention Awareness Scale (MAAS) in the experimental groups (higher in the control group). The difference suggests that there is heterogeneity in the mindfulness level across the groups despite the randomization process. The heterogeneity is probably related to the convenience sampling method applied in this study. Larger sample size and better randomization are recommended to overcome the problem. This study only utilized self-reported questionnaires i.e. DASS 21 and MAAS; each has its own limitation and produce measurement bias. In future, more objective questionnaires such as clinician-rated questionnaires or objective biomarkers of stress [i.e. stress hormone (salivary cortisol) level or pro-inflammatory cytokine interleukin-6 (IL-6)] to improve the quality of measurement (50).

How should a brief one-day MBI be integrated into the speech clinic for caregivers in Malaysia? At present, there was no evidence-based research to prove whether it is useful to provide mindfulness training in the speech clinic for caregivers who have children with speech-language pathology. Practical options include integrating mindfulness education into the parent training module as ongoing activities in speech clinic or parent support group activities. It can also be delivered with the aid of phone app, online webpage or self-help compact disc (CD).

CONCLUSION

A brief one-day MBI for caregivers of children with speech-language pathology significantly reduced psychological distress; which was sustained for one-month post-intervention. Although further studies are needed, the MBI shows a promising role in reducing

psychological distress among caregivers.

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