Efficacy of Psychoeducation and Relaxation Interventions on Stress-Related Variables in People With Mental Disorders: A Literature Review

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A B S T R A C T

This paper aimed to critically review and summarize empirical evidence concerning the efficacy of psychoeducation or relaxation-based stress management interventions on stress-related variables in people with mental disorders. Electronic databases were used during the literature search. Thirteen articles that fulfilled the preset eligible criteria were included in the review. Findings indicated that psychoeducation and relaxation-based interventions mitigated stress and depression; and enhanced relaxation intensity and knowledge on stress management. However, mixed results were obtained on anxiety. In addition, interventions using virtual reality technology revealed positive effects on depression, relaxation intensity and anxiety. Limitations and recommendations for future research are discussed.

Mental disorders refer to clinically significant behavioural or psychological syndromes in an individual that lead to impaired functioning (American Psychiatric Association, 2000). Examples of mental disorders include mood disorders, anxiety disorders, adjustment disorders, and schizophrenia. Persistent, on-going and high levels of stress caused by various stressors can put one at risk for a mental disorder (Danese & Pariante, 2008). Simultaneously, the symptoms associated with the mental disorder can lead to further stress, depression and anxiety which can worsen the condition (Wilson, 2009). The resulting vicious cycle is disruptive for the individual's health and, thus, necessitates effective treatments to assist the individual to lead a fulfilling life with stress maintained at healthy levels.

Existing treatments for mental disorders usually focus on psychopharmacology (Buila, 2009), which consist of five major groups: antipsychotics, antidepressants, anxiolytics, mood-stabilisers, and stimulants. Studies showed that medications are effective in relieving symptoms of mental disorders (Gaudiano, Weinstock, & Millier, 2008). However, as much as these medications are indispensable, they may be insufficient when used alone (Buila, 2009). Many medications such as antidepressants require about 2 to 6 weeks to exert maximum therapeutic effects and, hence, there is a time gap in providing individuals in the inpatient setting with a therapeutic option (Knubben et al., 2007). In addition, various side effects associated with medications (especially for antipsychotics) lower adherence such that more than 60% of individuals with mental disorders are at least partially non-adherent to medications (Gaudiano et al., 2008). Among the most debilitating side effects are weight gain, adverse cardiovascular and nervous system complications and extrapyramidal symptoms (such as pseudo-parkinsonism and tardive dyskinesia) (Fretwell & Fretce, 2006). Even with the new generation of medications with fewer side effects, costs of these medications remain high (Patel, 2008). The various disadvantages of psychopharmacological treatments described above emphasize the need for non-pharmacological interventions.

Stress management interventions, one of the non-pharmacological treatments, are theory-based programmes developed to help individuals improve personal efficacy in managing stressors (Weber, 2001). Two widely-used stress management interventions are psychoeducation and relaxation interventions. Psychoeducation is the provision of clinically-relevant information to address psychological variables in individuals with a physical or psychological disorder (Donker, Griffifths, Cuijpers, & Christensen, 2009). It can include the nature of psychological health issues and strategies to manage them. Psychoeducation can be carried out through face-to-face interaction or through audio-visual aids (such as brochures or videos) (Donker et al., 2009).

In clinical settings, increasing emphasis has been placed on the knowledge an individual possesses about their condition. A study on a needs-based psychoeducation programme among patients with mental disorders revealed that knowledge about stress management

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was cited as a major need among the patients (Chien, Leung, & Chu, 2012). Another study on patients suffering from mood disorders suggested that the lack of knowledge (on what a mood disorder is and how to manage it) contributed to the patients' anxiety (Proudfoot et al., 2009). Conversely, studies showed that equipping individuals with major depressive disorder (MDD) or bipolar disorder (BD) with the illness-related knowledge helped improve depression, anxiety and other health outcomes (Danese & Pariante, 2008; Kronmuller et al., 2007). Furthermore, patients who had significantly more knowledge about mood disorders had more stable remission rates compared to those with lower knowledge levels (Kronmuller et al., 2007).

Relaxation interventions (such as meditation, yoga, muscle relaxation, abdominal breathing, and guided imagery) have been widely used among patients in various health settings (Donker et al., 2009; Jorm, Morgan, & Hetrick, 2009). In the state of relaxation, individuals retreat mentally from their surroundings to decrease tension and induce calm/relaxed feelings (Demarco-Sinatra, 2000). The relaxation response undoes the stress response, leading to reduced sympathetic nervous arousal and the activation of the parasympathetic nervous system (Friedman, Myers, & Benson, 2001). This activation results in decreased muscle tension, blood pressure, heart rate and respiration rate. The relaxation response also activates the limbic system, which might help alleviate depression and anxiety (Hoch et al., 2012).

Psychoeducation and relaxation interventions complement each other by providing theoretical and practical approaches to alleviate stress, depression and anxiety. Unlike psychopharmacology, both methods are cost-effective and are not associated with disabling side effects (Walsh, 2011). In addition, the knowledge and skills acquired from the interventions may contribute to the long-term self-management of mental disorders.

Despite the various benefits of psychoeducation and relaxation, their effects on people with mood disorders are not adequately known. Therefore, this literature review aimed to summarize current empirical evidence regarding the efficacy of psychoeducation and relaxation interventions on stress, depression, anxiety, perceived relaxation, or knowledge in individuals with mental disorders.

METHODS

A literature search was conducted using four electronic databases: CINAHL, PsycINFO, PubMed and Scopus. These databases were chosen as they contain a wide range of potentially relevant journals to the phenomenon of interest. The following keywords were permutated and used in the search: *mental disorders*, *psychoeducation*, *relaxation* and *stress management*. The inclusion criteria for this review were: (a) studies used randomized controlled trials (RCT) or quasi-experimental design, (b) outcome variables included subjective or objective stress, depression, anxiety, relaxation, or knowledge levels, (c) participants were adults (aged 21–65 years old) with mental disorders, and (d) articles were written in English and published in the past 10 years (from 2003 to 2013). Studies were excluded if samples involved healthy individuals or if their mental disorder was secondary to a medical condition.

RESULTS

Of the 7431 studies yielded from the literature search, 82 abstracts and subsequently 27 full articles were evaluated (Figure 1). Finally, 13 articles were selected and carefully reviewed. Five studies included people with MDD, BD, dysthymic disorder or dysphoria. Four studies had post-traumatic stress disorder (PTSD), two had anxiety disorder, one involved PTSD, adjustment disorder (AD) or pathological grief (PG), and another one had schizophrenia. Six studies were quasi-experimental in design and the remaining ones used RCTs. Within the RCT studies, control groups received standard routine care/alternative interventions or were placed on a waiting list. Three studies incorporated virtual reality (VR) technology into their interventions. VR refers to the integration of real-time computer graphics and audio input to create a visual display delivered through a screen attached to a head mounted device (Gregg & Tarrier, 2007). The presence of a vivid realm serves as a powerful visual imagery tool to trigger relaxation and enhance pleasant mood making VR a therapeutic tool used in the mental
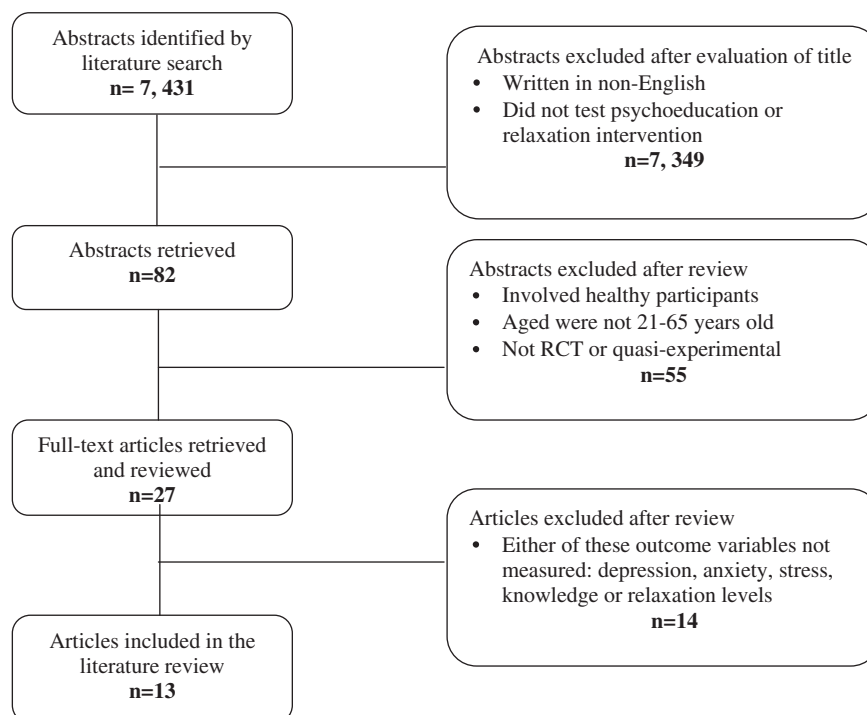

Fig 1. Summary of literature search on psychoeducation and relaxation interventions.

Table 1
Summary of Included Studies.

Author	Design	Intervention	Sample	Instruments	Data Collection	Data Analysis	Findings
Banos et al. (2011)	RCT	Experiment group: EMMA therapy (psychoeducation, guided imagery, breathing) delivered via virtual reality device. Control group: Standard CBT (psychoeducation, guided imagery, breathing) delivered face-to-face Both groups: 1.5–2 hour weekly sessions for 9 weeks	PTSD, PG or AD $n_{ext} = 39$ $n_{con} = 20$	Beck Depression Inventory (BDI)	Pretest Posttest	ANOVA	Following the intervention, there were significant differences in depression and relaxation intensity but not in anxiety were observed between the experimental group and control group
Bernhard et al. (2006)	Quasi experimental	Cognitive psychoeducation program (90-minute, bi-weekly session for 14 weeks)	Bipolar I, II disorder $n = 62$	Hamilton Depression Rating Scale German knowledge questionnaire	Pretest Posttest	Paired t-test	Significant improvement on knowledge was reported (% of correct answers for pre-test was 46.9% while post-test was 49.6%)
Blanaru et al. (2012)	Quasi experimental	Self-administered therapy (listening to CD on muscle or music relaxation during desired bedtime for 40 minutes over 1 week)	PTSD $n = 13$	Beck Depression Inventory State Trait Anxiety Inventory (STAI) Hamilton Anxiety Scale (HAS)	Pretest 2 posttest (after each relaxation intervention)	Two-way ANOVA	There were significant reduction in depression following the intervention There were no significant reduction in anxiety based on the STAI and HAS
Chen et al. (2009)	RCT	Experimental group: group-based progressive muscle relaxation 25 minutes daily Control: standard care	Schizophrenia $n_{ext} = 9$ $n_{con} = 9$	Beck Anxiety Inventory Finger temperature (prior to and 3 minutes after each PMRT session)	1 day retest, 11 days posttest and 1 week follow-up.	t-test Mann–Whitney U-test	Anxiety decreased significantly in experimental group more than the controls after 11 days ($Z = -4.1, P < .0001$) Anxiety decreased significantly in experimental group more than control group at 1 week = follow up ($Z = -2.0, P = .04$) Finger temperature was significantly greater in experimental group than control groups
Colom et al. (2003)	RCT	Experimental group: Group-based psychoeducation (weekly 90-minute session for 20 weeks) Control group: standard care	Highly compliant bipolar I disorder $n_{ext} = 25$ $n_{con} = 25$	Hamilton Rating Scale for depression	Fortnightly for 20 weeks and monthly for 2 years	Kaplan Meyer's survival analysis	The number of depressive episodes were significantly lower in experimental group when compared to the control group ($P = 0.004$)
Gamito et al., 2010	RCT	Psychoeducation given only in the first session of 12 sessions VR exposure therapy, Exposure in imagination (EI) and waiting list (WL)	War veterans with PTSD $n_{ext} = 5$ $n_{con} = 5$	Beck Depression Inventory	Pretest Posttest	RM ANOVA	In the VR exposure therapy group, depression significantly decreased at posttest as compared to pretest
Kitchiner et al. (2009)	RCT	Experiment group 1: group-based, stress-control psychoeducation (2-hour sessions held weekly for 6 weeks) Experiment group 2: Traditional anxiety management Control group: Waiting list	Anxiety disorder $n_{ext1} = 25$ $n_{ext2} = 24$ $n_{con} = 24$	General Health Questionnaire-Anxiety subscale	Pretest, Posttest, 1, 3 and 6 months follow-ups	Linear regression analyses	No significant differences in anxiety between and within groups at immediate, 1, 3, 6 month follow-ups
Knubben et al. (2007)	RCT	Relaxation group: 10 minutes/session over 10 days Exercise group: 30 minutes/session over 10 days	Major depression $n_{ext} = 20$ $n_{con} = 18$	Bech–Rafaelsen Melancholy Scale	Pretest Posttest	ANCOVA	Post-intervention, the exercise group had significantly lower depression than the relaxation group
Little, Kligler, Homel, Belisle, and Merrel (2009)	Quasi experimental	Psychoeducation on – Lifestyle modification – Meditation – Mind/body skills	Dysthymic disorder $n = 14$	Beck Depression Inventory (BDI)	Pretest, Posttest, 12 weeks follow-ups	Mixed modal regression	Depression decreased significantly at post test and follow ups

Study	Design	Intervention	Sample	Outcome measure	Timing	Analysis	Findings
Oflaz et al. (2008)	quasi experimental	Experimental 1: Psychoeducation plus medications (PEM), Experimental 2: Psychoeducation only (PE), (Both group: 1–1.5 hour weekly psychoeducation session for 6 weeks) Control: Medication only (M)	PTSD $n_{pem} = 21$ $n_{pe} = 14$ $n_m = 16$	Hamilton Depression Scale (HDS)	Pretest Posttest	Paired t-test ANCOVA	There were significant differences in depression between the PEM and M groups at post intervention
Pratt et al. (2005)	Quasi experimental	Psychoeducation using video and discussion format (3 sessions within 1 week)	PTSD $n = 70$	Knowledge of PTSD Test (KPTSD)	Pretest Posttest	ANOVA	There was significant increase in knowledge post-intervention ($F = 14.54$, $P < .0001$)
Watkins & Moberly, (2008)	RCT	Group 1: Relaxation training (RT), 12 minutes of progressive muscle relaxation Group 2: Relaxation training (RT) + concreteness training (CT)	Dysphoria $n_{rt} = 20$ $n_{rt/ct} = 16$	Beck Depression Inventory	Pretest Posttest	Mixed two way ANOVA	There was a significant difference in depression scores between the RT + CT group and RT group at posttest
Yuen et al. (2013)	Quasi experimental	VR-based intervention (second life) incorporating psychoeducation and behaviour therapy (12 weekly 1-hour session)	Social anxiety disorder $n = 14$	Liebowitz Social Anxiety Scale Beck Depression Inventory	Pretest, midtest, posttest and 3-month follow up	RM ANOVA	There was a significant reduction in depression at posttest and follow-up as compared to pretest and midtest ($P < .01$) There was a significant reduction in social anxiety at posttest and follow-up as compared to pretest and midtest ($P < .01$)

health field (Ku et al., 2007). Studies using VR showed promising results in reducing phobia, trauma and pain across various populations (Banos et al., 2011). A summary of the included studies have been tabulated (Table 1).

Effects of Relaxation Interventions

Four studies explored the effects of a relaxation-based intervention on stress, depression and anxiety and mixed findings were obtained (Blanaru et al., 2012; Chen et al., 2009; Knubben et al., 2007; Watkins & Moberly, 2008).

A single-blinded RCT was carried out to compare the effects of exercise therapy and relaxation training on depressive symptoms in 39 individuals with MDD (Knubben et al., 2007). The study took place over 10 days in an inpatient setting in Germany. Data based on the Bech–Rafaelson Melancholy Scale (BRMS) showed that there was a significantly greater reduction in depressive symptoms in the exercise therapy group as compared to the relaxation group following the intervention. The difference in findings between groups could be attributed to differing activity time allocated to each intervention. Activity time for the relaxation group was only 10 minutes compared to the 30 minutes allocated to the exercise group. The greater amount of activity time in the exercise group could have limited the effects of the relaxation training group.

A similar RCT compared the effects of progressive muscle relaxation training (PMRT) with concreteness training (CT) on depressive symptoms in 39 patients with dysphoria in the United Kingdom (Watkins & Moberly, 2008). Participants were placed in a PMRT or combined PMRT and CT group. PMRT involved systematic tensing and relaxing of muscles to induce relaxation while CT focused on exploring details of feelings towards given hypothetical scenarios to induce emotional reactivity. In this study, PMRT took place over 12 minutes while CT involved a 70-minute mental exercise. Participants from the combined CT and PMRT intervention exhibited significantly lower depression scores than participants who had undergone PMRT only. Similar to the study by Knubben et al. (2007), the greater amount of time allocated to the CT group could have strengthened the positive effect of the intervention as compared to the PMRT group which was only allocated 12 minutes. Hence, the lack of standardization of time allocated to each intervention group demonstrated in both studies by Knubben et al. (2007) and Watkins and Moberly (2008) creates a potential for bias in findings.

Depression was shown to decrease significantly following a music and muscle relaxation intervention carried out on 13 patients with PTSD in Israel (Blanaru et al., 2012). Participants had undergone 40 minutes of music relaxation over 1 week followed by 40 minutes of muscle relaxation over the following week. The music and muscle relaxation exercises were based on an audio relaxation CD provided. However, despite the significant reduction in depression following the intervention, there were no significant differences in anxiety levels. It is important to highlight, however, that the selection criteria for participants in this study included a diagnosis of chronic insomnia in addition to PTSD. The additional manifestation of chronic insomnia could have made a significant decrease in anxiety more difficult to achieve (Blanaru et al., 2012).

Conversely, a significant reduction in levels of anxiety following a relaxation intervention was observed in the study by Chen et al. (2009). The RCT study explored the effects of PMRT on anxiety and stress in 18 patients with schizophrenia in Taiwan. Participants experienced daily PMRT for 25 minutes over 11 days as compared to the control group which was provided standard care. Anxiety was measured through the Beck's Anxiety Inventory (BAI) and finger temperature was obtained at the start and end of each session to measure objective stress (Chen et al., 2009). A higher finger temperature is reflective of lower stress and anxiety. There was a significant reduction in anxiety on the BAI and an increase in finger

temperature in the PMRT group following the intervention. The findings on anxiety were sustained at a 1-week follow-up. The sample size in this study was, however, small and findings could limit generalizability of findings to the rest of the patient population. Nevertheless, unlike the other studies carrying out relaxation interventions, Chen et al. obtained objective measures of stress, through the measurement of finger temperature, in addition to subjective measures. This strengthened the reliability of the findings obtained in this study.

Mixed findings were obtained on the effects of relaxation interventions on anxiety in people with mental disorders leaving the results inconclusive. Additionally, stress was measured in only one of the relaxation-based interventions and perceived relaxation levels were not obtained in any of these studies. Therefore, more can be explored on the effects of relaxation-based intervention on these stress-related variables.

Effects of Psychoeducation Interventions

Psychoeducation was conducted in seven studies and six of which had positive outcomes on depression, anxiety or knowledge levels (Bernhard et al., 2006; Colom et al., 2003; Gamito et al., 2010; Oflaz, Hatipoglu, & Aydin, 2008; Pratt et al., 2005; Yuen et al., 2013).

A single-blinded RCT was carried out on 50 patients with BD in Spain to test the effects of group psychoeducation on depressive symptoms (Colom et al., 2003). Participants in the experimental group were provided weekly 90-minute psychoeducation sessions over 20 weeks. Each session focused on symptom monitoring, treatment adherence and illness management skills. Participants in the control group were gathered together during the same time frame but no intervention was provided. Findings showed that the number of depressive episodes at a 2-year follow-up had significantly decreased in the participants who had undergone the psychoeducation programme as compared to the control group. The RCT added to the strength of the study which further reinforced the positive findings. However, only patients who were highly compliant to treatments were recruited as participants. Hence, the findings obtained may not be reflective of all individuals with BD.

Effects of psychoeducation on depression were measured in another study with a quasi- experimental design (Oflaz et al., 2008). In this study, 51 participants were allocated into one of three groups; psychoeducation group, medication group or combined psychoeducation and medication group. Six sessions were conducted weekly and each session lasted between 60 and 90 minutes. Results at posttest showed that depression decreased significantly for participants who had received psychoeducation or combined psychoeducation with medication as compared to participants who were only given medication. The study by Colom et al. (2003) complements the study by Oflaz et al. (2008) and have shown positive outcomes of psychoeducation on depression.

Apart from reducing depression, psychoeducation was also shown to enhance knowledge levels. A quasi-experimental design was implemented in a study conducted to evaluate the effects of a cognitive psychoeducation group therapy on knowledge in 62 patients with BD in Germany (Bernhard et al., 2006). The intervention consisted of 90-minute psychoeducation sessions held twice a week over 7 weeks. Knowledge levels were measured based on a questionnaire developed for the study with no evidence of content validation. This might affect internal validity of research findings.

Knowledge was measured in another study examining the effects of the psychoeducation programme on 70 inpatients with PTSD (Pratt et al., 2005). This study was quasi-experimental in design and the intervention was delivered over three sessions within 1 week. Participants viewed a psychoeducational video on PTSD and engaged in a group discussion. Findings showed that knowledge on PTSD improved significantly at posttest. Similar to

the study by Bernhard et al. (2006), the instrument used to measure knowledge was developed for this study without any report on its psychometric properties. Hence, although results from these two studies showed the promising effect of psychoeducation on knowledge, the lack of well-developed instruments posed a limitation to the findings in the studies.

Virtual reality (VR) was incorporated into three studies as a tool to deliver the stress management interventions. A pilot RCT was carried out to evaluate the effects of the VR exposure therapy on depression in 10 patients with PTSD across 12 weeks in Portugal (Gamito et al., 2010). Participants were allocated to a VR exposure therapy, exposure in imagination, or waiting-list control group. 'Exposure in imagination' involved the therapist exposing the participants to a traumatic event in the form of guided imagination to overcome fear and anxiety associated with the traumatic event. 'VR exposure therapy' is a similar technique but carried out through a VR device instead of being therapist-guided. Psychoeducation on emotion management was provided to both treatment groups at the first session. Results were positive in that depression significantly decreased at posttest as compared to pretest in the VR exposure therapy group. However, since psychoeducation was only administered at the first session, its unique effect on the participants could not be determined. Furthermore, changes in depression levels were only measured in the VR exposure group. Hence, between-group differences could not be determined.

Yuen et al. (2013) carried out a study similar to that of Gamito et al. (2010). Both of these pilot studies incorporated VR as a tool to deliver the intervention which took place over 12 weeks. Yuen et al. (2013) carried out a VR-based intervention incorporating psychoeducation and behaviour therapy on 14 individuals with social anxiety disorder (SAD). Participants were given psychoeducation on SAD, practised behavioural techniques and did homework exercises after every session. Each session was delivered by a VR programme called Second Life where participants created their own avatar through which the behavioural techniques were practised. Findings showed that depression and anxiety significantly reduced at posttest as compared to pretest. This effect was also sustained at a 3-month follow-up. However, unlike the study by Gamito et al., participants in the study by Yuen et al. were not randomized. Furthermore, although both studies reflected positive findings of the effect of the VR-based interventions, sample sizes obtained were small, thus, reducing generalizability of these findings.

Despite the encouraging findings by Yuen et al. (2013) on the efficacy of a psychoeducation intervention on anxiety, a similar reduction in anxiety was not observed in the study by Kitchiner et al. (2009). An RCT was carried out to examine the effects of the stress-control psychoeducation on anxiety in 73 individuals with anxiety disorder (Kitchiner et al., 2009). The 2-hour group psychoeducation sessions were held weekly over 6 weeks and were based on a manual provided. Participants were randomized to a stress-control psychoeducation group, traditional anxiety management psychoeducation group or placed on a waiting list control group. Participants in the stress-control psychoeducation group were provided psychoeducation on anxiety which focused on practising problem-solving on their own. Participants in the anxiety management group were provided psychoeducation on anxiety with a focus on participants sharing and learning from one another. Data was collected over 6 weeks using the anxiety subscale of the General Health Questionnaire (GHQ). The findings showed no significant decrease in anxiety within each group or between groups at posttest or at a 6-month follow up.

Effects of Combined Psychoeducation and Relaxation Interventions

Of the 13 studies reviewed, 2 studies examined a combined relaxation and psychoeducation and both studies yielded positive

findings on depression, anxiety and relaxation intensity (Banos et al., 2011; Little et al., 2009).

An RCT was carried out to compare the effect of the EMMA therapy (VR-guided combined psychoeducation and relaxation) with standard CBT in 39 patients with PTSD, AD or PG (Banos et al., 2011). Participants in the standard CBT group received imagery exposure, slow breathing training and psychoeducation (responding to a stressful event and preventing relapses) administered by the therapist. Participants in the EMMA therapy received the same intervention but it was administered through the VR device. The weekly 90–120 minute sessions were carried out over 9 weeks. Depression was measured based on the Beck's Depression Inventory (BDI) while relaxation intensity and anxiety were measured on visual analogue scales. As compared to the controls, the VR therapy group reported significantly decreased depression and increased relaxation intensity. However, significant difference on anxiety was not observed.

A quasi-experimental design was conducted to evaluate the effect of the mind–body group therapy on 14 patients with dysthymic disorder (Little et al., 2009). This pilot study involved 12 weekly 90-minute sessions consisting of a psychoeducation (lifestyle modification) and relaxation (meditation and breathing exercises) components. Findings showed a decrease in depression at posttest; which was sustained at the 16th and 24th week follow-up assessments. However, these findings may be limited by the small sample sizes obtained.

Knowledge Gaps and Methodological Limitations in Existing Literature

There are several knowledge gaps present across the studies. Firstly, studies exploring VR as a tool to deliver interventions have shown positive impact on stress-related variables (Banos et al., 2011; Gamito et al., 2010). Nevertheless, the VR technology is still at its infancy stages and limited studies examined VR-based interventions on individuals with mood disorders. Secondly, there is a paucity of studies exploring the effect of psychoeducation and relaxation interventions on stress, depression, anxiety, relaxation and knowledge in individuals with mental disorders. During our literature search, it was noted that majority of the studies used the following outcomes: the number of hospitalization days, time in between relapses and compliance rates. Lastly, most studies were conducted in Western countries with only one study (Chen et al., 2009) carried out in Asia. Since the nature of stress and the attitudes towards stress management approaches in an individual are highly influenced by the environmental and socio-cultural factors, it would be important to derive implications from studies that are catered for the Asian cultures and contexts.

Some methodological limitations were found among the included studies. Small sample sizes were observed in most studies, which may restricts the generalizability of the findings yielded (Polit & Beck, 2010). Power analysis to determine sample size is useful in reducing type II error or a false negative in the findings (Polit & Beck, 2010). However, most studies did not report the use of power analysis in determining their sample size.

The quality of instruments used to measure the various outcome variables differed across studies. It was not reported if the visual analogue scale used in the study by Banos et al. (2011) to measure relaxation intensity and anxiety was validated. Additionally, the content validity of the self-developed knowledge questionnaires in two studies measuring knowledge was not reported (Bernhard et al., 2006; Pratt et al., 2005). This might affect the validity of the findings.

The relaxation interventions by Blanaru et al. (2012) and Watkins and Moberly (2008) required the participants to practice the relaxation exercises independently, without the presence of a trained therapist or research assistant to monitor adherence or accuracy of the technique practiced. This questioned the treatment adherence of

both studies as there was no confirmation that the relaxation training was carried out accurately or even carried out at all. Hence, reports from these participants might be questionable.

The majority of the studies employed only subjective measurements of outcome variables. Only one study obtained finger temperature readings as an objective measure of stress (Chen et al., 2009). While subjective reports of stress-related variables through questionnaires are powerful reflections of an individual's perception of these variables, they may be subjected to potential response bias (Polit & Beck, 2010). Since the stress response activates several physiological changes that lead to increased blood pressure, heart rate and peripheral vasoconstriction, objective measurements of stress through blood pressure, heart rate and skin temperature could increase the validity of the findings.

DISCUSSION

This review aimed to summarize current knowledge regarding the efficacy of psychoeducation and relaxation intervention on people with mental disorders. Our findings suggested that psychoeducation could enhance participants' knowledge levels and mitigate depression and anxiety. An existing meta-analysis also reported that psychoeducation was efficacious in reducing stress in the general population (Daele, Hermans, Audenhove, & Van der Bergh, 2012). Furthermore, relaxation interventions (music and muscle relaxation) appeared to more efficacious than standard care in diminishing depressive symptoms. However, relaxation alone was not as efficacious as exercise or the combination of CT and relaxation. The effects of relaxation on anxiety were inconclusive. Our findings are in line with a systematic review (Jorm et al., 2009) that supports the efficacy of relaxation on depression among patients with medical conditions. In addition, our findings indicated that the combination of psychoeducation and relaxation (such as abdominal breathing and guided imagery) could mitigate depression in people with PTSD, adjustment disorder, pathological grief, and dysthymic disorder. Finally, virtual reality technology appeared to be a promising method in delivering psychoeducation and relaxation interventions.

The beneficial effects of psychoeducation and relaxation interventions may be attributed to several factors. According to the hopelessness theory (Abramson, Alloy, & Metalsky, 1989), activities that help reduce depression are those that restore hopefulness or reduce stress in individuals. Psychoeducation components achieve these through the dissemination of information, which might empower the participants with the knowledge of their mental disorders and stress-related factors. These might reduce the feeling of ambiguity, confusion, and stress (Kronmuller et al., 2007). Furthermore, knowledge attained through psychoeducation might help enhance understanding and instill hope on how to manage the mental disorder (Knubben et al., 2007). In addition, optimal learning can be achieved in learner-directed environments (Conti, 2009). The existing psychoeducation contained information catered for participants' needs and used interactive methods (such as face-to-face learning and group discussion) to maximize learning outcomes.

Relaxation interventions induce a relaxation state; a physiological response in the body that is opposite to that of the stress responses. The relaxation response, elicited through the various relaxation techniques, reduces the activity of the sympathetic nervous system and, thus, counterbalances the stress responses (Schaffer & Yucha, 2004). The relaxation response simultaneously activates the parasympathetic nervous system, resulting in decreased muscle tension/metabolism and an increase in calming effects and pleasant moods (Friedman et al., 2001).

Positive outcomes of studies using the combined psychoeducation and relaxation components could be attributed to the use of the two-prong approach. The psychoeducation component provided essential knowledge while the relaxation component offered the opportunity

to practice useful techniques, including abdominal breathing and guided imagery. This could have increased the retention of knowledge and relaxation skills in the participants, thus, contributing to the added success of the intervention in reducing stress-related variables.

In addition, studies incorporating the VR technology into their interventions revealed positive effects. These findings are consistent with results from previous studies (Banos et al., 2011; Gamito et al., 2010; Little et al., 2009). VR, as a tool, reaches to the audio, visual and sensory receptors of the person, and thus enhancing the relaxation experiences and providing less distracted learning environment (Banos et al., 2011). The personalized viewing through the VR device contributes to the creation of a relaxing environment which could have contributed to the positive findings on perceived relaxation in the participants.

This literature review has at least two limitations. First, only articles published in English were included, and thus potentially relevant studies published in other languages might be left out. Secondly, unpublished studies were not included in this review. Provided that studies with non-significant findings are less likely to be published in journal articles, our findings might not be best represent all empirical evidence. Readers may need to interpret the findings with caution.

Implications to Nursing

This literature review highlights the potential effects of psychoeducation and relaxation interventions on people with mental disorders, adding more integrated knowledge to nursing science. Nurses may apply this knowledge to their clinical practice. For instances, relaxation techniques (such as music, abdominal breathing, and muscle relaxation) can be delivered to patients with mention disorders during their hospitalization. Furthermore, nurses may integrate psychoeducation into their clinical practice and they need to select content and intervention formats appropriate for their participants.

Additional research is required to expand the limited literature. Future studies need to examine the efficacy of psychoeducation, relaxation, and the combination of the two interventions on people with mental disorders. Virtual reality can be used to deliver the interventions. Treatment adherence should be monitored and assessed. Various outcomes could be used including objective stress, subjective stress, anxiety, depression, perceived relaxation, and knowledge levels, among others. Rigorous methods (such as RCT), larger sample sizes, and multiple research settings are essential to ensure the internal and external validity of findings. Participants should also be more diverse covering various subgroups (age, gender, ethnic groups, socio-cultural backgrounds). Qualitative methods can be used for the process evaluation and the perception of participants towards the interventions.

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