Mind-Body-Spiritual Care for Coronary Heart Disease Patients
A Systematic Review

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Keywords: Mind-Body-Spiritual, Nursing, Care, Coronary Heart Disease, Acute Coronary Syndrome, Distress.

Abstract: Background. Coronary heart disease (CHD) patients hospitalized for acute coronary syndrome may experience bio-psycho-spiritual distress. The objective of this study was to assess evidence of nursing care or other interventions addressing the patient's bio, psycho, and spiritual issues and determine the efficacy of the existing intervention tailored to tackle the issues. Methods. A comprehensive search was carried out on various databases i.e. PubMed (Medline), Embase, CINAHL, Scopus, Springerlink, PsycInfo, ProQuest, EBSCOHost, Web of Science Clarivate Analytic and Science Direct. Unpublished studies were also searched from libraries and university repositories. Results. Seventeen out of 1215 papers meeting inclusion criteria were included in the review. The study encompassing mind, body, and spiritual nursing care was very limited in number, most reviewed papers were not on nursing care and examined the individual intervention. All reviewed studies reported positive results. Nevertheless, the reviewed studies were very diverse in terms of intervention (dose, the method of delivery, length of follow up), the patients' condition treated, and outcome measured makes it difficult to conclude on a certain nursing care model and its effectiveness for the CHD patients. Conclusion. Further study is necessary to develop the best nursing care model for coronary heart disease patients and to examine its effectiveness in alleviating patients' issues.

1 BACKGROUND

Patients with coronary heart disease (CHD) may experience psychological distress and also physical issues. A study conducted at three hospitals in Surabaya, Indonesia revealed that patients with CHD hospitalized for acute coronary syndrome experienced psychological stress, ranging from mild to severe in scale, as well as other issues (Kurniawati, Nursalam & Suharto, 2017).

Psychological distress stemmed from the illness-related issues, the hospital environment, the other patients' condition and separation from family or relatives; whereas the other dominant issues were a hemodynamic imbalance, discomfort, and pain (Kurniawati et al., 2017). Physical stress experienced by CHD patients included unstable airways, oxygenation, and hemodynamic disturbance. Psychological stress might be caused by a critical condition, death risk, social isolation and an alien environment (Elliot, Aitken & Chaboyer, 2007). Psychological issues when left untreated will negatively affect CHD patients. A study involving 100 respondents confirmed the relationships between psychological problems and biological markers of inflammation that play a significant role in exacerbating the CHD, namely IL-1β, IL-6, and TNF-α (Miller, Freedland, Carney, Stetler & Banks, 2003). Another study of 82 AMI and CABG survivors concluded that psychological distress correlated negatively with health-related quality of life (HRQOL), post-traumatic distress symptoms, and mental health outcomes (Bluvstein, Moravchick & Sheps, 2013).

Patients' spiritual need should not be neglected by the nurse. A systematic review of 54 studies comprising 12,327 patients concluded that many patients want their doctor to address their spiritual needs during the medical consultation (Best, Butow & Olver, 2015). Similarly, a cross-sectional study in Palestina found that providing spiritual care was very important to 275 cardiac patients treated at a coronary care unit (Abu-El-Noor & Abu-El-Noor, 2014). Another study found that both psychological and spiritual care have a strong relationship with a patient's satisfaction (Clark, Drain & Malone, 2003). Therefore, spiritual care is an important aspect that cannot be overlooked.

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Interventions that include the physical, psychological and spiritual (mind-body-spiritual) aspects will help the patient overcome the physical and psychological stress optimally. Yet, to the best of our knowledge, a systematic review regarding this intervention is not available.

Some systematic reviews and meta-analyses have examined the mind-based intervention and concluded the efficacy of the intervention in reducing stress of healthy individuals (Khoury, Sharma, Rush & Fournier, 2015), psychological, physical, and bio-molecular parameters of HIV patients (Yang, Liu, Zhang, & Liu, 2015), and patients with vascular disease (Abbott et al., 2014). The mechanism by which the mind-based interventions affect wellbeing has also been studied, where a systematic review and meta-analysis of 20 studies found several factors underlying mind-based intervention, i.e. cognitive and emotional reactivity, mindfulness, anxiety reduction, ability in digesting the problem, self-compassion and psychological flexibility (Gu, Strauss, Bond & Cavanagh, 2015). To date, there is no review that examines evidence of mind body-spiritual nursing care for CHD patients.This systematic review evaluates evidence of a nursing care model addressing a patient's issues and determines the efficacy of the existing model tailored to tackle the issues.

2 METHODS

The systematic review was guided by PRISMA protocol (Preferred reporting items for systematic review and meta-analysis) (Moher et al., 2009).

2.1 Identification of Studies

Searches of both published and unpublished studies were conducted by the authors. The search for published studies was done comprehensively using several keywords: "coronary heart disease" OR "acute coronary syndrome" OR "heart attack" OR "hemodynamic" OR "pain", "nurse" OR "nursing care", "mind*", "body", "spirit*", "distress", "holistic", "quality of life" OR self-efficacy, and "well being." The search was carried out on various databases i.e. PubMed (Medline), Embase, CINAHL, Scopus, Springerlink, PsycInfo, ProQuest, EBSCOHost, Web of Science Clarivate Analytic and Science Direct. Unpublished studies were also searched from libraries and university repositories.

Several MeSH terms used to locate articles were heart disease, meditation, stress, yoga, catecholamines, hormones, hypnosis, guided imagery, spiritual, mindfulness, body, clinical trial, coronary artery disease, adult, and human. The search terms were formulated using the PICO framework, where P (population) was patients with coronary heart disease with acute coronary syndrome, I (intervention) was nursing intervention or nursing model consisted of mind-body spiritual, or mind-body or spiritual nursing, C (comparison) was standard care or other relevant care, and O (outcomes) was either physical, psychological, bio-molecular or quality of life. The searches were limit to publication in English or Bahasa Indonesia and year of publication of 2000 up to February 2018.

2.2 Study Selection

The titles and abstracts of citations identified by searches were examined by two reviewers independently; disagreements about the study were resolved by consensus among the authors.

2.2.1 Inclusion and Exclusion Criteria

Some criteria were imposed for study selections: 1) an experimental or observational study, 2) adult sample, 3) patients with coronary heart disease or acute coronary injury, 4) addressing bio-psycho-social-spiritual issues, 5) the intervention(s) was mind-body-spiritual or mind-body. Studies falling under these criteria were excluded from the review: 1) reviews, 3) qualitative study, and 4) the outcome measures did not relate to health.

2.2.2 Quality Assessment

Assessment of methodological quality of studies meeting the inclusion criteria was conducted using the CONSORT (consolidated standards of reporting trials) checklist (Schulz, Altman, Moher & Group, 2010) or STROBE (strengthening the reporting of observational studies in epidemiology) checklist (von Elm et al., 2008). Critical appraisal was guided by the JAMA (Journal of American Medical Association) guides for quantitative studies (Guyatt, Sackett & Cook, 1993, 1994). The critical appraisal and study quality assessment were carried out by the authors independently; and, as previously stated, any discrepancies between the authors' decisions were resolved by consensus.

2.2.3 Types of Interventions

Studies are considered eligible if the intervention given was mind-body spiritual or mind-body or spiritual care for patients.

2.2.4 Types of Outcome Measures

Outcome measures were stress reduction, spirituality enhancement, biomolecular markers, pain reduction, and regulation of hemodynamic parameters e.g. blood pressure, heart rate, oxygenation. The other outcome measures were the quality of life and perceived self-efficacy.

2.2.5 Length of Follow-up

Studies that measure the outcome shortly after the intervention or long after the intervention (up to 1 year) were both included in the review.

3 RESULTS

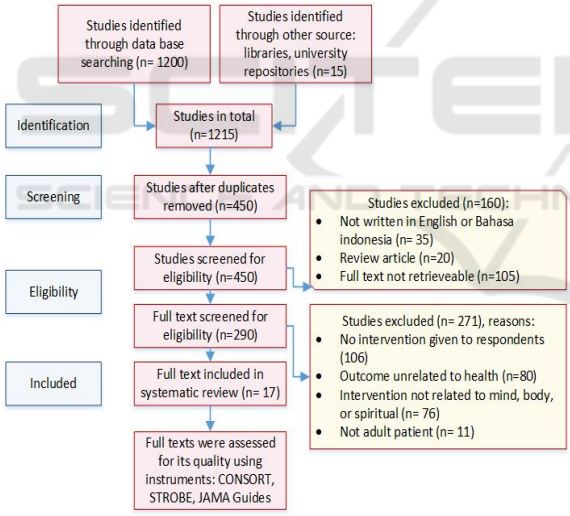

Diagram 1: Study selection based on PRISMA statement.

As can be seen from Diagram 1, 1200 studies were yielded from the electronic search while an additional 15 studies were found from the manual search. The first screening process managed to remove 765 articles because they were identified as duplicates. A first screening process based on language, type of article, and availability of its full text was able to exclude 160 articles. The remaining 290 studies were then screened for eligibility based on some inclusion and exclusion criteria, i.e. outcome measures, type of intervention, and sample characteristics. Seventeen studies were included in the review.

3.1 Study Characteristics

Table 1 summarizes articles included in the systematic review; 4 articles were published between 2000 and 2007 and the remaining were published or conducted from 2010 to 2017. Studies were conducted in diverse locations: Asia, America, and Europe. Eleven studies were RCT and the rest of them were not RCT experiments. Eight studies used standard care groups, 2 articles from the same study employed waitlist control, 2 with placebos, 1 with self-help booklet, and 2 studies not using a control group. Patients recruited in the studies vary slightly, with 3 studies recruiting CHD patients peri-operatively, 3 during acute coronary syndrome (ACS) attack, and the remaining recruited hospitalized CHD patients or CHD patients in the community.

3.2 Intervention Characteristics

It was difficult to find a specific nursing intervention or nursing care model addressing comprehensively patients' mind, body and spiritual needs. Table 1 summarizes the characteristics of intervention given to the patients to address the mind, body, or spiritual issues of the patients. There are a wide variety of interventions given to the patients, ranging from mindfulness exercises, yoga, spiritual mantram, nursing care, and other interventions.

The majority of interventions were mindfulness exercise or spiritual intervention alone, or a combination of mind and spiritual, which were delivered individually to the respondents; only one intervention involved group meetings. Additionally, most interventions were provided in healthcare settings, only 5 interventions were given for outpatients.Most included studies reported frequency and dose of intervention given to respondents. The dose ranging from 20 minutes up to 24 hours a day with frequency ranging from once a day until continuously during the day. The length of intervention and follow up ranges from 3 days to 1 year. Some interventions were provided by nurses or other healthcare professionals, the rest were done by the respondents independently. Most of these interventions were directed to tackle a single or group of patients' issues, but none of them were tailored to overcome the mind, body, and spiritual issues of patients comprehensively.

Table 1: The Study and Intervention Characteristics.

No	Study & Setting	Design	Sample	Intervention (s)	Control	Outcome (s)	Findings
1.	Bakara et al. (2013) Indonesia	Quasi experiment	42 ACS patients not in ACS attack, hospitalized ≥24 h, fully awake, with depression, anxiety, or stress; treatment group (n=23, 4 D.O), control group (n=19)	Self-emotional freedom technique 15 m in duration once only, guided by trained personnel	Standard care	Depression, anxiety, stress.	Significant difference in mean score of anxiety and stress. No significant difference at depression score
2.	Bakar (2017) Indonesia	Quasi experiment	20 ACS patients : Treatment group Control group	Islamic nursing care model characterized by maintaining confidence, compassion, and competence.	Standard nursing care.	Psychospiritual comfort and cortisol level.	The nursing care significantly enhanced patients' psychospiritual comfort but it did not attenuate the level of cortisol.
3.	Carneiro et al. (2017) Brazil	RCT, double blind	41 patients with ACS and other cardiovascular disease, allocated randomly into 3 groups (@16 patients): Spirit passé group Sham group Placebo group	• Spirits "passé" group and Sham: 10 min sessions 3 consecutive days, instructed to direct thought at Jesus with wishes of healing • Spirits group: spirit healers and respondents moved hands longitudinally from head to toe for 5 m, followed by laying hands over respondents' head and chest. • Sham: healer transmitting sincere wishes.	Placebo: 10 min sessions for 3 consecutive days receiving no intervention.	Depression, anxiety, pain intensity, physiologic parameters (HR, SpO2).	Spirit passé significantly effective in reducing anxiety, muscle tension, improving SpO2 and well-being.

4.	Delui, Yari, Khouyinezhad, Amini, & Bayazi, (2013) Mashad, Iran	Quasi-experiment	45 CHD patients with depression (18 female, 27 male), age 40-65 y, divided into: Relaxation group Meditation group Control group	• Relaxation group: 10 sessions of Jacobson's progressive muscle relaxation, @20-25 min, 3 times a day with an educational CD. • Meditation group: 10 sessions of mindfulness meditation technique, @20-25 min, 3 times a day with an educational CD.	Standard intervention.	Depression, systolic blood pressure, diastolic blood pressure, heart rate, and anxiety.	• Significant reduction in depression, BP (systolic and diastolic) and HR in meditation group. • No significant difference in BP, HR, anxiety and depression between groups. • A significant reduction in depression scores of meditation compared to control group.
5.	Ikedo, Gangahar, Quader & Smith (2007) The USA	RCT	78 CHD patients underwent cardiac surgery, divided into: Relaxation group (n=27) Prayer group (n=24) Control group (n = 27)	Given headphones connected to a CD player: 1 group listened to prayer during the surgery, the other listened to relaxation technique.	Placebo	Tension/anxiety, depression, anger,	No difference on all aoutcome measures
6.	Kim, Cho, & Cho (2017) Busan, Korea	Prospective cohort	34 female patients, mean age 52 with microvascular angina.	• Mindfullness-based stress reduction for 8 consecutive weeks, comprises 2.5 hour weekly practice of mindfulness training, body scan, sitting meditation, and hatha yoga), education (15-30 persons of group learning), and 1 hour daily practice (meditation, yoga, and awareness	Baseline value	Endothelial function, Left ventricular function, reactive brachial flow-mediated dilatation. Emotional stress.	Mindfulness based stress reduction reduces all stress parameters (somatization, phobic anxiety, paranoid ideation, and psychoticism) except hostility, systolic BP and endothelial and myocardial function.

				training). • Anti-anginal medication.			
7.	Lukman, Akbar, & Ibrahim (2012) Indonesia	Quasi experiment	42 adult with ACS	Zikr asmaul husna (Islamic spiritual mantram of the God's Holy names) repeat several times a day.	None	Anxiety	Significant reduction of anxiety level.
8.	Robert McComb, Tacon, Randolph, & Caldera, (2004) The USA	RCT	18 women (mean age 60 years) with angina, CHF, hypertension and valve disorder.	• Mindfulness based stress reduction program: 2 h at night each week over 8 w consisted of the body scan, sitting meditation, and hatha yoga. • Additional experential learning regarding stress responses.	Wait list	Stress hormones, sub-maximal stress response & physical functioning.	No significant main effect or interaction for the stress hormones and submaximal stress response. There was significant effect between group for ventilation and breathing frequency.
9.	Manchanda et al. (2000) India	RCT	42 men with angiographically proven coronary artery disease (CAD) divided equally to treatment and control group.	Yoga, control of risk factors, diet control and moderate aerobic exercise 1 year follow up.	Standard care: risk factor control and AHA's step I diet	Number of angina attacks, lipid profile, exercise capacity, body weight.	Significant different in all parameters
10.	Momeni, Omidi, Raygan, & Akbari (2016) Kashan, Iran	RCT, single blind	60 cardiac patients	8 of 2.5 h sessions of MBSR comprises structured educational program and formal meditation (mindful body scan, sitting meditation, walking meditation, and yoga).	Standard intervention, no psychological intervention.	BP, perceived stress, anger measured at pre and post intervention.	MBSR significantly reduced anxiety, stress, anger, systolic BP.

11.	Mufarokhah, Putra, & Dewi (2016) Indonesia	Quasy experiment Pre-post test	28 ACS patients	5 sessions of health education 2x/w @ 30 m, followed by individual counselling at patients' home for 1 week.	None	Coping, medication adherence.	Significant difference for coping and medication adherence.
12.	Nyklíček, Dijksman, Lenders, Fonteijn, & Koolen (2014) The Netherlands	RCT	114 adults (94 male and 20 female), mean age of 55 y.o patient underwent primary coronary intervention.	• A brief mindfulness training: 90–120 m weekly: (1) psycho-education: role of behavior, bodily sensations, emotions, and thoughts (2) psycho-education: role of mindfulness and non-judgmental acceptance in stress reduction, (3) mindfulness practices (4) discussion of one's experiences while doing the practices. • Daily practice	Self-help booklet	Anxiety, depression, stress, vitality, mindfulness.	No significant effect on stress & anxiety, depression, and vitality. Significant effect on psychological QOL, but not the physical QOL.
13.	Parswani, Sharma, & Iyegar (2013) Bangalore, India	RCT	30 male CHD patients allocated randomly to MBSR and control group	• MBSR: 1-1.5h/w for 8 respective weeks of mindfulness meditation. • 30 m daily exercise of mindfulness meditation and body scan meditation, guided by audio cassette with recorded instruction. • Instructed to maintain health behavior, i.e. regular exercise, diet.	Usual treatment: Instructed to maintain health behavior, i.e. regular exercise, and maintain diet.	Hospital anxiety and depression, stress, BP, BMI measure at pre, post-test and 3 months follow up.	Significant reduction of anxiety, depression, BMI, systolic BP.

14.	Schneider et al., (2012) Fairfield, Iowa, The USA	RCT	201 black CHD patients of both sexes with angiographic evidence of coronary artery stenosis.	• A 7-step course instruction: 1.5-2-h of transcendental meditation. • Transcendental meditation: 20 m twice a day. • Follow up and maintenance meetings up to average of 5.4 years	Cardiovascular health education 20 m a day heart-healthy behavior.	Time to first mortality BP psychosocial stress factors; and lifestyle behaviors.	Significant reduction of mortality risk, MI, and stroke in CHD patients. These changes were associated with lower BP and psychosocial stress factors.
15.	Stein et al. (2010) The USA	RCT	43 CABG or CABG plus valve replacement patients: TG (n=25) divided into 2 groups: 14 in the guided imagery group, 11 in the music-only group, CG (n=18)	Asked to listen to audiotapes at least once a day, every day, for 1 week throughout the preoperative preparation and more often if they desired and intraoperatively, and again 6 months postoperatively.	Standard care	Anxiety, depression, mood disturbance, anger, fatigue, confussion, and bewilderment.	No significant difference in post operative or 6 month follow up of any aoutcome measures.
16.	Tacón, McComb, Caldera, & Randolph (2003) The USA	RCT	18 heart disease women (angina, hypertension, valve disorder).	Kabat-Zinn's mindfulness-based stress reduction program: 2 h per week plus additional homework practice for respective 8 weeks.	Wait list control	Anxiety, emotional control, coping styles, and health locus of control.	Significant reduction of anxiety, emotional control and coping.
17.	Warber et al. (2011) Michigan, the USA	RCT	58 ACS patients with depression, recruited from advertisement and enrolled, 41 of which completed the	• Four day workshop: Group 1: A spiritual retreat (imagery, meditation, drumming, journal writing, and nature-based activities). Group 2:	Standard care	Depression, spiritual well-being, perceived stress, and hope.	Depression was not significantly different among groups, hope was significantly higher in the intervention group.

			treatment course.	Lifestyle Change Program (nutritional education, exercise, and stress management). • Bi-weekly follow up phone calls-3 consecutive months.			

Note: ACS: Acute coronary syndrome, AHA: American Heart Association, BP : Blood pressue, CHD: coronary heart disease, HR: heart rate, h: hour(s), m: minute(s), MBSR: Mindfulness-based stress reduction program, MI: myocardial infarction, w: week(s), y: year(s).

3.3 Outcomes

Most studies have proven the effectiveness of the interventions included in the systematic review, including psychological or biological parameters. The positive psychological results reported in the studies were reducing anxiety, depression, stress (Bakara et al., 2013; Carneiro et al., 2017; Delui, Yari, Khouyinezhad, Amini & Bayazi, 2013; Ikedo, Gangahar, Quader & Smith, 2007; Lukman, Akbar & Ibrahim, 2012; Momeni, Omidi, Raygan & Akbari, 2016a; Nyklíček, Dijksman, Lenders, Fonteijn & Koolen, 2014; Parswani, Sharma & Iyegar, 2013; Stein et al., 2010; Tacón, McComb, Caldera & Randolph, 2003; S L Warber et al., 2011), increasing psycho-spiritual comfort (Bakar, 2017), coping (Mufarokhah, Putra & Dewi, 2016), spiritual wellbeing (Warber et al., 2011), and anger, confusion, fatigue (Ikedo et al., 2007) and hope (Warber et al., 2011). The reported positive biological parameters include stress hormones (Robert McComb, Tacon, Randolph & Caldera, 2004), hemodynamic parameters (Carneiro et al., 2017; Delui et al., 2013; Momeni et al., 2016a; Parswani et al., 2013), myocardial infarction attack and cardiac revascularization (Schneider et al., 2012) and cardiovascular function (Kim et al., 2013).

4 DISCUSSION

To the best of our knowledge, this is the first systematic review of mind, body and spiritual nursing care aimed at improving CHD patients' mind, body, and spiritual wellness. This systematic review followed the PRISMA statement as a guideline in conducting the systematic review. Seventeen articles from 16 studies were included in the review.

This review confirmed the findings of previous systematic reviews assessing psychological intervention both for a healthy or sick individual of various medical conditions that for mindfulness alone, mind-body combination, mindfulness or spiritual intervention alone or in combination showed positive results for CHD patients with various conditions (perioperative, hospitalized, at home).

The strengths of the studies included in the review were the clarity of reporting in terms of the intervention provided for the respondents and the ability for the examination of the study quality by the authors.

Despite the aforementioned strengths of the studies under review, there are some weaknesses of the available studies, specifically the study designs and the types of intervention given to the patients under study.

Only eleven of 17 articles included in the review employed the research design of randomized control trial (RCT). Because the reviewed studies examine the effectiveness of an intervention or group of interventions, the most appropriate study design is RCT; another study design may lead to bias because the maturation effect cannot be examined. Not all reviewed papers used a control group. This may lead to outcome bias because it cannot be compared with others.

Another issue is the rigorous approach to conducting and analyzing findings of the studies. Some RCT studies failed to conceal from the respondents, or the investigators, or both, the group

to which the respondents had been allocated. This may lead the investigator to tend to overestimate the effect of the treatment. The small sample size used in some studies (Bakar, 2017; Mufarokhah et al., 2016; Robert-McComb et al., 2004; Tacón et al., 2003) also poses a generalizability issue of the studies' findings. It was difficult to specify the correct number for a sample size because the authors did not report the power calculation to set the sample size used in their studies.

Among the studies that used a comparator group, some used a placebo, a standard treatment group, a self-help intervention, and a waitlist. The standard treatment group is the best choice for the type of intervention (related to mind-body or mind-body-spiritual) because it is ethically acceptable and appropriate to the CHD patients. The use of a waitlist as control group (Robert-McComb et al., 2004; Tacón et al., 2003) may also carry the potential for bias because the author might overestimate the effect size, the other problem with waitlist control is that the generalizability of the study is limited only to the population who agreed to wait for the intervention.

Finally, determining what is and is not a mind-body-spiritual nursing care is impossible because there is no study that demonstrates the comprehensive mind, body, spiritual nursing care found to be reviewed.

4.1 Implication for Practice

This systematic review enabled us to conclude on a specific nursing intervention addressing mind, body, and spiritual issues experienced by CHD patients due to the limited supporting evidence gathered from the review.

4.2 Implication for Research

Further study to examine a nursing care that is tailored to address CHD patients' mind, body, and spiritual issues is warranted.

4.3 Limitation

The limitations of this systematic review related to the study quality. Some reviewed studies failed to report the randomization process, the blinding process or others.

4.4 Conflict of Interest

The authors declare that there is no conflict of interest.

5 CONCLUSIONS

The study examined a comprehensive mind, body, and spiritual nursing care for CHD patients that is yet available. Although all reviewed papers reported positive results, there were a wide variety of interventions provided by various professionals, making it difficult to conclude on a certain nursing care model and its effectiveness for the CHD patients.

Further study is required to develop the best nursing care model for coronary heart disease patients and to examine its effectiveness in alleviating patients' issues.

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