



Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

Kerr, D;McCann, T;Mackey, E;Wijeratne, T

Title:

Effects of early motivational interviewing on post - stroke depressive symptoms: A pilot randomized study of the good mood intervention program

Date:

2018-01-01

Citation:

Kerr, D., McCann, T., Mackey, E. & Wijeratne, T. (2018). Effects of early motivational interviewing on post - stroke depressive symptoms: A pilot randomized study of the good mood intervention program. *International Journal of Nursing Practice*, 24 (4), <https://doi.org/10.1111/ijn.12657>.

Persistent Link:

<https://hdl.handle.net/11343/283776>

Kerr Debra (Orcid ID: 0000-0002-2956-2432)

Title Page

Project title

Effects of early motivational interviewing on post-stroke depressive symptoms: a pilot randomised study of the Good Mood Intervention program.

Short Title

Motivational interviewing after stroke

Author names and affiliations

Debra Kerr¹, BN, MBL, PhD; Associate Professor of Nursing, Discipline of Nursing, d.kerr@deakin.edu.au¹;

Terence McCann¹, BN, PhD; Professor of Nursing Research, Terence.mccann@vu.edu.au;

Elizabeth Mackey², BN, MNurs; Stroke Nurse Practitioner, Elizabeth.mackey@wh.org.au;

Tissa Wijeratne^{2,3}, MBBS; Neurologist, tissa.wijeratne@wh.org.au.

1: Victoria University, College of Health and Biomedicine, St Albans Campus, McKechnie St, St Albans, Victoria, 3021.

2: Western Health, Furlong Rd, Sunshine, Victoria, 3021.

3: The University of Melbourne, Carlton, VIC 3053.

Corresponding author (Present address)

Debra Kerr¹

Associate Professor, School of Nursing and Midwifery

Deakin University; 1 Gheringhap St, Geelong; Locked Bag 20001, Geelong, 3220.

Email: d.kerr@deakin.edu.au

Ph: 61 3 5227 2501

Acknowledgements

Erika Borkoles (expert advice, and feasibility review for the motivational interviewing technique); Elizabeth Burke (facilitator); Simon Jenkins (facilitator); Justine Mizen (assisted with development of the protocol, workshop participant); Flora McCann (research assistant responsible for collection of follow up data); Phuoung Nim (facilitator); Alfonse Montebello (workshop participant); Leanne Rhodes (project manager); and Rozit Tecele (workshop participant).

Authorship

All authors made substantial contributions to the following: (1) the conception and design of the study and analysis and interpretation of data, (2) drafting and/or revising the article for important intellectual content, and (3) final approval of the version to be submitted.

¹ Present address for Debra Kerr: Associate Professor, School of Nursing and Midwifery, Deakin University, Waterfront Campus, Geelong, Victoria, 3220

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: [10.1111/ijn.12657](https://doi.org/10.1111/ijn.12657)

Project title

Effects of early motivational interviewing on post-stroke depressive symptoms: a pilot randomised study of the Good Mood Intervention program.

ABSTRACT

Aims:

The aim of this pilot randomised study was to investigate the feasibility of early motivational interviewing, for reducing mood after acute stroke.

Background:

Depression is a frequent consequence of stroke that can adversely affect recovery.

Methods:

Design: Pilot randomised study. Intervention group patients received three, individual motivational interviewing sessions by nurses or social workers prior to hospital discharge.

Participants: Adult patients with acute stroke during 2013-2014.

Blinding: Research assistant who collected data was blind to group assignment.

Outcomes: Data were collected at three time points: baseline, one-month and three-month follow-up. Outcome measures (anxiety, depression, quality of life) were analysed by descriptive statistics.

Results:

Forty-eight patients were enrolled, and 79% retention was achieved at 3-months. Eight participants withdrew (16.7%) and two were unable to participate (death: 2.1% and new onset aphasia: 2.1%), leaving 38 participants in the final cohort (Intervention: N=18, Control: N=20). Anxiety, depression and quality of life measures did not alter significantly in the study period.

Conclusions:

Carefully designed studies are required to investigate the effectiveness of early motivational interviewing for improving mood after stroke. The therapy can be administered by nurses, but significant resources are required in terms of training and fidelity.

Trial registration: ACTRN12617000245392 Australian New Zealand Clinical Trials Registry (ANZCTR).

SUMMARY STATEMENT

What is already known about this topic?

- Depression is a frequent consequence after stroke that can adversely affect recovery. Motivational interviewing (MI), a directive, patient-centred, collaborative technique for motivating individuals to change behaviour, may be a safer alternative to antidepressants.
- Evidence suggests that MI is effective for chronic health conditions (e.g., cardiovascular disease, diabetes, hypertension, obesity) in which behaviour change is key, and the most common challenge is motivation.
- There is limited evidence of the effectiveness of MI for supporting mood adjustment after acute stroke in the acute settings.

What this paper adds:

- MI can be incorporated into usual care within the acute setting by nurses and social workers, but substantial resources are needed.
- Stroke patients had signs of anxiety and depression at baseline. However, no significant changes were observed in the intervention group for anxiety, depression and quality of life at the 3-month follow-up period.
- Future studies should be designed with larger samples, and robust fidelity testing.

The implications of this paper for practice:

- It is important to consider prior to hospital discharge the psychological needs of patients who have experienced an illness such as stroke.

- Significant resources are required in terms of training to initiate a therapeutic technique, such as MI interviewing, which is quite different from most nurses' day-to-day work in stroke units.
- There remains a lack of strong evidence to confirm the effectiveness of MI for enhancing mood after stroke.

Keywords:

Anxiety, Depression, Motivational interviewing, Nurses, Quality of life, Stroke.

INTRODUCTION

The psychiatric complications of stroke have received limited attention compared to motor, language and intellectual problems (Robinson & Spalleta, 2010). Estimates of the prevalence of post-stroke depression (PSD) range from 19.5% to 31% (Hackett & Pickles, 2014; Robinson & Spalleta, 2010), and it is more likely to occur within 12 months (Hackett & Pickles, 2014).

PSD has adverse implications for rehabilitation; it increases morbidity and contributes to mortality (Robinson & Spalleta, 2010; Watkins et al., 2011; Williams, Ghose & Swindle, 2004; West, Hill, Hewison, Knapp & House, 2010)). In a systematic review, Kutlubaev & Hackett (2014) found a consistent negative effect of depression on stroke outcomes including worse functional outcomes, higher mortality, lower quality of life (QOL) less use of rehabilitation services, and increased need for institutional care after stroke. Several approaches have been used to treat PSD. Antidepressants have been identified as beneficial in some studies-(Antai-Otong, 2004; Farrell, 2004; Van de Meent, Geurts & Van Limbeek, 2003), but a Cochrane review (Hackett, Anderson, House & Xia, 2008) concluded that while these may improve PSD, they have side effects.

Hospital length of stay (LOS) is decreasing for the majority of patients with stroke (Frost, 2016). This reduces the time frame in which stroke survivors and families can be provided with information they will need prior to discharge home. It has been proposed that resources that could enhance the transition from hospital to home are sub-optimal, with challenges for patients in obtaining information about their condition (Anderson et al., 2000), lack of assistance in managing cognitive and behavioural problems (Grant, Glandon, Elliott,

Giger & Weaver, 2004), and poor access to community and rehabilitation services (Ski & O'Connell, 2007).

Specifically in relation to emotional needs, the Australian 'Clinical Guidelines for Stroke Management 2017' (Stroke Foundation 2017) recommend that patients are informed that mood problems are common at any stage in recovery after stroke and all patients should be assessed for mood disturbance before discharge. The diagnosis of mood disturbances after stroke can be problematic because of stroke-specific complications (e.g., aphasia, cognitive impairments). Patients may also be adjusting to impairments resulting from the stroke (e.g., upper and lower limb deficits). There is evidence to suggest that the prevalence of PSD increases after the initial weeks and up to three months after the stroke event. (Aben et al., 2003; Paolucci, Gandolfo, Provinciali, Torta, & Toso, 2006) Hence, in an era of reduced LOS, the opportunities to identify the development of a mood disturbance after stroke are reduced (Frost, 2016).

Difficulties with identifying mood disturbances, particularly after acute discharge, and no consensus regarding the most effective pharmacotherapy (Paolucci, 2017) have raised interest in alternative therapies such as motivational interviewing (MI) (Hackett et al., 2008). Brief MI, a directive, patient-centred, collaborative technique for motivating individuals to change behaviour (Miller & Rollnick, 2004; Arkowitz, Westra, Miller & Rollnick, 2008), may be a safer than antidepressants. MI was first described in 1983 as a brief intervention for problem drinking (Rollnick, Miller & Butler, 2008). Since that time, there is evidence that MI is effective for numerous chronic health conditions (e.g., cardiovascular disease, diabetes, hypertension, obesity) in which behaviour change is key.

The efficacy of MI has been assessed (Lundahl, Kunz, Brownell, Tollefson & Burke, 2010) in a meta-analysis (N=119), across a number of conditions. The reviewers concluded that the technique required minimal training for trainers, took limited time to conduct, and achieved varying rates of success in improving health outcomes. Only one randomised controlled trial (RCT) (Watkins et al., 2017; Watkins et al., 2011), conducted in the United Kingdom has incorporated MI after acute stroke. In contrast to the traditional use of MI as a therapy to encourage behaviour change, Watkins et al. (2011) study aimed to assess its effect for improvements in mood. The hypothesis was that enhanced confidence in their ability to adjust and adapt to personal goals of recovery would lead to an improved psychological state. MI was administered to patients after acute stroke through weekly sessions for four weeks. The findings showed the intervention group experienced a significant improvement in mood (at 3 months and 12 months) and reduction in mortality. MI was applied by trained nurses and psychologists in that study. Further qualitative analysis applied in that original study, found that MI facilitated healthy adjustment after stroke, which, in turn, affected mood (Auton et al, 2016). However, the authors were unable to explain how this effect was achieved and recommended further research.

To our knowledge, no Australian study has been undertaken using MI after stroke. Improving patients' mood can assist recovery from stroke and, indirectly, provide an economic saving to the healthcare system and reduce families' burden of care. Another advantage is it can be incorporated readily into usual care, with some training, by health professionals. This increases the likelihood of its adoption and long-term sustainability in settings where patients with stroke receive care. Prior to this study, concerns were raised

about low rates of documentation for mood assessment prior to hospital discharge (anecdotal evidence) at the organisation in which this was performed. It was our concern that clinicians, and in particular nurses who are at the forefront of clinical care, were not confident in speaking with patients about mood disturbances after stroke or were too busy to engage in this conversation. The time prior to hospital discharge was considered an opportunity for clinicians to intervene.

METHODS

Aims

The primary aim of this pilot randomised study was to investigate the feasibility (application, recruitment and retention) of early MI, via the 'Good Mood Intervention Program'. A secondary aim was to assess for improvement in patients' mood (anxiety and depression) and QOL after acute stroke. The study was unique in that the intervention was administered during hospitalisation. The MI intervention designed for the study was tailored to support adjustment. This differs from the traditional approach of MI which is focused on behavioural change to improve health conditions, such as smoking, diet and exercise modification for heart disease (Rollnick et al., 2008). The ability to engage in healthy adjustment is dependent on the absence of mood disturbances. (Auton et al., 2016). It has been proposed that stroke survivors should be assisted to explore their concerns, which ideally will lead to reduced ambivalence and strengthened commitment to achieving specific goals in their recovery (Quinn et al., 2009). Hence, the focus of our intervention was to support the stroke survivor to adjust to life after stroke.

Design

As far as practicable, this pilot randomised study, followed the requirements of the CONSORT 2010 statement for conducting parallel group randomised trials. A pilot study is conducted in preparation for a randomised controlled trial and is designed to test the feasibility of an intervention (Eldridge et al., 2016).

The study was conducted at an acute metropolitan tertiary adult healthcare organisation, with approximately 800 beds across three acute hospital campuses in Melbourne, Australia. During the eleven-month study period (September 2013 to August 2014), average length of stay for patients with acute stroke was 6.2 days in the 4-bed Acute Stroke unit, situated within a 20-bed Neurology/Stroke Ward.

Intervention group patients received early MI, comprising three, 30-minute individual sessions by trained nurses or social workers during hospitalisation after an acute stroke. All three sessions were performed by the same facilitator on separate days prior to hospital discharge.

Sample

Due to heavy workloads related to clinical care, the project manager was unable to keep records of the numbers of patients who may have met eligibility criteria, but did not subsequently enrol in the study. Hence, Figure 2 describes those patients who were enrolled in the study. There were 752 admissions with stroke in 2013, and 890 in 2014.

Based on the Lancaster, Dodd and Williamson (2004) recommendation for sample size in pilot studies, and an expected attrition rate of 20%, a final sample of 30 participants (intervention: n=15, control: n=15) was sought. Inclusion criteria were: acute presentation after acute stroke (cerebral infarction/intracerebral haemorrhage); cognitively alert; and at

least 18 years of age. Exclusion criteria were: subarachnoid haemorrhage; subdural haematoma; severe communication problems (e.g., significant dysphasia or aphasia); mental health conditions, including depressive symptoms requiring professional support within one month; concurrent neurological disease/trauma; and myocardial infarction. Resources limited participation to patients who could speak and read English.

A project manager was enrolled to coordinate the study. Clinicians alerted the project manager of any patient meeting the study criteria. After confirmation of eligibility criteria, the project manager initiated the recruitment process.

A computer-generated block randomisation list equally divided all numbers between one and 60 into either treatment or control groups. Allocation to the intervention or control arms was concealed from participants until after recruitment and baseline data collection. Envelopes were prepared by the Principal Investigator and stored in a locked cupboard in the ward. The envelopes were numbered sequentially, indicating the order in which participants were enrolled into the study (e.g., the first participant received the envelope labelled 'Number 1', the second participant received the envelope 'Number 2', etc). A note in the envelope indicated the allocation (to intervention or control group), concealed by coloured paper to protect the identity of the allocation group. The project manager opened the randomisation envelopes after baseline data collection.

Training

Intervention group patients received early MI, provided by facilitators. Facilitators underwent formal MI training through completion of an online course ('Motivational Interviewing in Healthcare Online' - accredited by the Australian Psychological Society). In addition, all

facilitators participated two formal workshops (8 hours in total). This gave facilitators an opportunity to practice delivery of the Good Mood Intervention program in a simulated environment.

Unlike the Watkins et al. (2017) study, no formal measures of the quality of the MI technique were performed. Measurement of implementation fidelity was performed by an informal evaluation of an audio-recorded patient-facilitator interview. The selected interview was the first conducted by each facilitator. The academic reviewed the recording, and in cases where the intervention was not delivered according to MI principles or as prescribed in the protocol, additional training was provided on an individual basis.

The intervention

Initially, six clinicians (four nurses and two social workers) enrolled in the program. There were two rationales for nurses and social workers delivering the intervention. First, their ability to empathise with patients in this situation is more important than specialist knowledge of MI (Lundahl & Burke, 2009). Second, assuming that MI has beneficial outcomes for patients with stroke, and to ensure its long-term adoption and sustainability, it is important the technique is incorporated within usual care, primarily, by nurses and allied health clinicians in the acute setting.

After study allocation, the project manager assigned one of the six certified facilitators to intervention group participants. Facilitator selection was based on their availability, in that they had to be rostered to work on the subsequent two days to administer the second and third sessions. Facilitators were not involved in the recruitment process, they only delivered the Good Mood Intervention program. The rationale for using multiple

sessions was that a significant positive relationship exists between the amount of MI a person receives and treatment outcomes (Lundahl & Burke, 2009). A written guide for each session was provided to facilitators to support delivery of the program and enhance fidelity. The written guide for Session 1 is attached as Figure 1 (Session Guide). As we were interested in application in a 'real' clinical setting, clinicians were expected to deliver the intervention within their standard shift.

The over-arching principle of the intervention was to support the stroke survivor to adjust to life after stroke. The purpose of Session 1 was to set the agenda and encourage the patient to talk about adjustment to stroke. In Session 2 the patient was encouraged to identify realistic goals for recovery, and identify barriers to achieving goals. In Session 3, the goal was to identify any ambivalence ~~for~~ the patient had about achieving goals; support the patient's optimism and self-efficacy, and assist identification of solutions to solve problems. Participants were encouraged to summarise their goals and commitment, and clarify any information from the first two sessions.

The sessions were scheduled for 30 minutes. The shorter duration, when compared to the approach by Watkins et al. (2007), was designed so that clinicians had adequate time to devote to the session in tandem with their clinical responsibilities, and it was not too long after an acute illness. The control group received routine care provided by nursing, medical and allied health staff. On an ad-hoc basis, and usually only if patients were identified as having a mood disorder, referral for psychiatric assessment and provision of professional stroke brochures, such as those produced by the Stroke Foundation, were provided during

hospital admission. We did not collect data regarding referral for assessment and distribution of brochures for either group.

Data Collection

Data were collected at three time points: baseline, one-month and three-month follow-up.

Details of participant characteristics included: age; gender; marital status; living status; country of birth; ethnicity; and language spoken at home. Medical history details included type of stroke (ischaemic or haemorrhage) and past history of stroke or transient ischaemic attack. The Barthel Index (Maloney & Barthel, 1965) was measured at all three time points to assess ability to perform activities of daily living.

Depression and anxiety was measured by the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). This self-assessment scale measures levels of depression, anxiety and emotional distress for patients who are hospitalised. Normal range is between 0 and 7 (Ingvar, Dahlb, Tangen & Neckelmann, 2002). The scale has shown high internal consistency with Cronbach's alpha for anxiety of 0.83 and depression of 0.82 (Bjelland, Dahl, Haug & Neckelmann, 2002).

Depression was further measured by the Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer & Williams, 2001). This instrument is used for measuring the severity of depression; absence of depression is determined by a score less than 5. In a stroke population, the PHQ 9 had excellent discriminatory power for subjects with any depression, with an area under the curve of 0.96 (Williams et al., 2005).

QOL was measured by the QOL Index – Stroke Version (Ferrans & Power, 1985). The scale has a total QOL Index score and four sub-scales: Health and functioning, Social

and economic, Psychological and spiritual, and 4) Family. Survey responses are used to determine a score out of 30. Hence, a score of 30 would suggest high satisfaction for that domain. High validation of the QOL Index - Stroke Version has been confirmed (Buck, Jacoby, Massey & Ford, 2000). These tools are not used in clinical practice for identification of mood disorder.

The project manager collected data at baseline. The research assistant, a nurse with significant research experience, was employed to collect data at the two follow-up time points. Although intentionally blinded, the research assistant may have become aware of the allocation in conversation with the participant. Information was recorded on a hard-copy data-form and later transferred to an electronic database.

Ethical considerations

After confirming eligibility, participants were provided with written information about the study. After written consent was obtained, baseline data were collected from each participant. Ethics committee approval was obtained from the institution in which the study was conducted (HREC/13/WH/9).

Data Analysis

Retention rate was defined as the proportion of participants who completed baseline questionnaires and 3-month follow-up. This study was designed to generate descriptive statistics that could be used to evaluate the feasibility of the proposed methods and the effectiveness of the interventions. Hence, summary statistics were used to describe demographic characteristics and baseline and follow-up time-point measures. Intention-to-

treat principles were used: all participants who had completed at least one follow were included in the analysis. Analysis was performed using SPSS version 22 (IBM Corp, 2013).

RESULTS

All intervention group participants received three MI sessions prior to hospital discharge. Of the six clinicians who undertook online training and participated in the workshops, five (three nurses, two social workers) were selected to apply the MI intervention.

Forty-eight patients were recruited during the 11-month study period (Figure 2). Eight patients either withdrew or could not be contacted at 1-month follow-up. One patient died after enrolment in the study, and a further patient deteriorated and was unable to participate due to aphasia. Three participants withdrew prior to the 3-month period; however, 1-month follow-up data were included. The final sample included 38 participants who received the intervention (18 participants) or standard treatment (20 participants): a retention rate of 79.2%.

The characteristics of the participants are shown in Table 1. Patients were broadly similar for age, gender, nationality and marital status. Capacity to perform activities of daily living were similar, according to the Modified Barthel Index.

Study outcomes are shown in Table 2. The two groups were broadly comparable. However, depression scores varied slightly between the intervention group and control group depending on the scale used. For example, the intervention group had scores indicative of depression according to the PHQ-9 but normal values as measured by the HAD.

Regarding anxiety, participants in the control group had elevated anxiety scores (mean: 7.9) at baseline. Although a reduction in anxiety scores was observed at 1-month

Author Manuscript

follow-up for the intervention group, scores were similar to baseline at 3-month follow-up. In contrast, whilst anxiety scores were stable for the control group at 1-month follow-up, there was a slight decrease 3-month follow-up.

Depression scores increased slightly for both groups at 3-month follow-up, as measured by two separate scales (HADS, PHQ9).

The QOL - Index total score was high for both groups at 3-month follow-up, with no significant change across the three time-points. In addition, no differences were observed for the four-subcales.

DISCUSSION

Recruitment was slower than anticipated, and was largely driven by the availability of the project manager. Hence, during times of her absence, recruitment stalled significantly. There were times when allocation of a facilitator and completion of the three sessions-were challenged. On allocation, the facilitator had to be rostered to work on the subsequent two days to administer the subsequent sessions. There was also a need for the anticipated discharge to be at least two days from enrolment in the study. This may have affected recruitment and outcomes. In comparison, the LOS for intervention group participants in the study by Watkins et al. (2007) was significantly longer (median: 16 days) than this study (mean: 6.1. days). Hence, in acknowledgement of short LOS, it may be more feasible to conduct the intervention across the hospitalisation and post-hospitalisation periods.

Inconclusive evidence was found for the effect of MI on depression, anxiety and QOL measures. The positive effect on mood at 3-months found in the original Watkins et al.

(2007) study was not confirmed in this study. Arising from lack of resources, actual application of MI was not formally measured. Hence, there is a possibility that the MI technique was not strictly applied. Also, we did not analyse conversations for evidence of healthy adjustment after the stroke event. Auton et al. (2016) identified that stroke survivors who engaged in a MI conversation within six weeks (Watkins et al. 2007) focused on getting well and the implications of their stroke. In the current study, MI conversations occurred within a week of the stroke. At this acute stage, it is possible that the patient is focused on physical deficits, rather than considering adjustments to enhance recovery. The long term impact of these conversations on behavioural change and psychological state were not measured. Intervention patients may not have fully engaged in the MI conversations in the short period after the stroke, and this could have affected psychological adjustment after discharge. Future research should incorporate high-quality fidelity testing and analysis of MI transcripts to measure the quality of the technique.

In general, there were only slight variations across all mood scores. A small reduction in anxiety at 1-month follow-up for the intervention group was observed. However, the 3-month measurement was slightly higher than baseline. These findings should be viewed with caution when compared with previous work (Watkins et al., 2007). As highlighted, the conduct of this study was severely affected by resources for fidelity testing, content analysis of MI technique and recruitment. It is possible that the intervention had no real effect. Pilot studies commonly are at risk of type two errors error related to small samples and lack of power (Thabane et al., 2010). Regardless, this pilot study provides information to other researchers about the practicalities and feasibility of the study protocol, which should reduce

the need for duplication of efforts. Evidence of heightened levels of anxiety and depression were found at baseline in this study, and strategies are required to address these negative psychometrics.

The clinicians who provided the MI intervention in this study were either nurses or social workers. Nurses work in therapeutic and professional relationships with individuals, who may have health issues related to physical or mental illness and/or health challenges. They are expected to engage in therapeutic relationships. Likewise, the social worker adapts communication form and style to effectively communicate with a diverse range of people. Hence, the professional expectations for the nurse and social worker align strikingly with the philosophy of MI and the three underlying spiritual characteristics: collaborative, evocative, and honouring patient autonomy (Rollnick et al., 2008). MI is a relatively new technique in the prevention of PSD. To enable clinicians in this study to perform MI, they were required to complete an online training course which cost approximately \$450 (AU), attend two half-day workshops facilitated by a clinician with expertise in MI, and undertake a fidelity assessment. Training requirements were much higher in the Watkins et al. (2007) study. This resource requirement will need to be considered for application in the real-life clinical setting.

Study Limitations

This study had several limitations. There was moderate attrition which may have been a factor related to recovery or the study protocol (e.g., lengthy questionnaires and prolonged follow-up period). It is possible that some patients had returned to their normal activities (e.g., work, care-giving and leisure activities), which restricted their time to participate in the study. Extensive exclusion criteria limits generalisability of the findings, and in particular to

those patients who do not speak English or have dysphasia. -The intervention applied in this study varied from the original approach by Watkins et al. (2007) in several ways. In their study, the intervention was applied after hospital discharge for four weeks, the MI sessions lasted approximately 60 minutes, there were only four and there was more extensive training, high-quality supervision and fidelity testing. In addition, the sample size was significantly larger and they performed between-group analysis. Lack of resources precluded our ability to replicate all components of the Watkins et al. (2007) study, and collect robust data demonstrating eligibility, recruitment and referral for formal assessment. These factors may have affected application of the intervention and study outcomes. Hence, caution should be exercised when comparing the findings.

CONCLUSION

MI can be incorporated into usual care within the acute setting by health professionals, but substantial resources are required in terms of training and fidelity testing to initiate a therapeutic technique which is quite different for most clinicians. This study found evidence of anxiety and depression for stroke patients prior to hospital discharge. In an era where there is significant pressure to reduce LOS, it is important to consider the psychological needs of patients who have experienced an illness such as stroke. Future studies should consider alternative and robust recruitment strategies, a larger sample size and comprehensive fidelity testing.

ACKNOWLEDGEMENTS

Erika Borkoles (expert advice, and feasibility review for the motivational interviewing technique); Elizabeth Burke (facilitator); Simon Jenkins (facilitator); Justine Mizen (assisted with development of the protocol, workshop participant); Flora McCann (research assistant responsible for collection of follow up data); Phuoung Nim (facilitator); Alfonse Montebello (workshop participant); Leanne Rhodes (facilitator, workshop participant); and Rozit Tecle (workshop participant).

DISCLOSURE

This work was supported by the Stroke Foundation Research Grant (Australia) and [...] University. The authors declare no conflict of interest.

REFERENCES

- Aben, I. , Verhey, F. , Strik, J. , Lousberg, R. , Lodder, J. , & Honnig, A. (2003). A comparative study into the one year cumulative incidence of depression after stroke and myocardial infarction. *Journal of Neurology and Neurosurgical Psychiatry*, 74, 581-5.
- Andersen, G. , Vestergaard, K. , & Riis, J. (1994). Incidence of post-stroke depression during the first year in a large unselected stroke population determined using a valid standardized rating scale. *Acta Psychiatrica Scandinavica* 90, 190-5.
- Anderson, H. E, Schultz-Larsen, K. , Kreiner, S. , Forchhammer, B. H, Driksen, K. & Brown, A. (2000) Can readmission after stroke be prevented? Results of a randomized clinical study: A postdischarge follow-up service for stroke survivors. *Stroke*, 31, 1038-45.
- Antai-Otong, D. (2004) Poststroke depression: Psychopharmacological considerations. *Perspectives in Psychiatric Care*, 40, 167-70.
- Arkowitz, H. , Westra, H. A, Miller, W. R. , & Rollnick, S. (2008) *Motivational interviewing in the treatment of psychological problems*. New York: The Guilford Press.
- Australian Association of Social Workers. (2013) *Practice Standards*. Retrieved from <https://www.aasw.asn.au/practitioner-resources/practice-standards>.
- Auton, M. F. , Patel, K. , Carter, B. , Hackett, M. , Thornton, T. , Lightbody, C. E., Leathley, M. J. , & Watkins, C. L. (2016). Motivational Interviewing Post-Stroke: An Analysis of Stroke Survivors' Concerns and Adjustment. *Qualitative Health Research*, 26, 264-72.

- Banks, J. L. , & Marotta, C. A. (2007) Outcomes validity and reliability of the modified Rankin scale: implications for stroke clinical trials: a literature review and synthesis. *Stroke*, 38, 1091-6. doi: 10.1161/01.STR.0000258355.23810.c6.
- Bjelland, I. , Dahl, A. A. , Haug, T. T. , & Neckelmann, D. (2002) The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of Psychosomatic Research*, 52, 69-77.
- Buck, D. , Jacoby, A. , Massey, A. , & Ford, G. (2000) Evaluation of measures used to assess quality of life after stroke. *Stroke*, 31, 2004-10.
- Cheng, D. , Qu, Z. , Huang. , J. , Xiao, Y. , Luo, H. , & Wang, J. (2015) Motivational interviewing for improving recovery after stroke. *Cochrane Database of Systematic Reviews*, Issue 6. Art. No.: CD011398. DOI: 10.1002/14651858.CD011398.pub2.
- Eldridge, S. , Lancaster, G. A. , Campbell, M. , Thabane, L. , Hopewell, S. , Coleman, C. & Bond, C. M. (2016). Defining feasibility and pilot studies in preparation for randomised controlled trials: Development of a Conceptual Framework. *PLOS One*, 1-22.
- Farrell, C. (2004) Poststroke depression in elderly patients. *Dimensions of Critical Care Nursing*, 23, 264-9.
- Ferrans, C. E. , & Powers, B. R. (1985) Quality of Life Index: development and psychometric properties. *Advances in Nursing Science*, 8, 15-25.
- Frost, P. (2016) Hospital Performance: Length of Stay. Victorian Auditor-General's Report.

- Grant, J. S. , Glandon, G. L. , Elliott, T. R. , Giger, J. N., & Weaver, M. (2004) Caregiving problems and feelings experienced by family caregivers of stroke survivors the first month after discharge. *International Journal of Rehabilitation Research*, 27, 105-11.
- Hackett, M. L. , Anderson, C. S. , House, A., & Xia J. (2008) Interventions for treating depression after stroke. *Cochrane Database of Systematic Reviews*, 4. doi: 10.1002/14651858.CD003437.pub3.
- Hackett, M. L. & Pickles, K. (2014). Part I: frequency of depression after stroke: an updated systematic review and meta-analysis of observational studies. *International Journal of Stroke*, 9, 1017-25.
- IBM Corp. (2013). *IBM SPSS Statistics for Windows, Version 22.0*. New York: Armonk.
- Ingvar, B. I. , Dahlb, A. A. , Tangen H. T. , & Neckelmannd, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of Psychosomatic Research*, 52, 69-77.
- Kroenke, K. , Spitzer, R. L. , & Williams, J. B. (2001) The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16, 606-13.
- Kutlubaev, M. A. , & Hackett, M. L. (2014). Part II: predictors of depression after stroke and impact of depression on stroke outcome: an updated systematic review of observational studies. *International Journal of Stroke*, 9, 1026-1036.
- Lancaster, G. A. , Dodd, S., & Williamson, P. R. (2004) Design and analysis of pilot studies: recommendations for good practice. *Journal of Evaluation in Clinical Practice*, 10, 307-12. doi: 10.1111/j.2002.384.doc.x.

- Lundahl, B. W. , & Burke, B. L. (2009) The effectiveness and applicability of motivational interviewing: A practice friendly review of four meta-analyses. *Journal of Clinical Psychology*, 65, 1232-45. doi: 10.1002/jclp.20638.
- Lundahl, B. W. , Kunz, C. , Brownell. C. , Tollefson, D. , & Burke, B. L. (2010) A meta-analysis of motivational interviewing: Twenty-five years of empirical studies. *Research on Social Work Practice*, 20, 137-60. doi: 10.1177/1049731509347850.
- Mahoney, F. I, & Barthel, D. W. (1965) Functional evaluation: the Barthel Index. *Maryland State Medical Journal*, 14, 61-5.
- Miller, W. R. , & Rollnick, S. (2004) Talking oneself into change: Motivational interviewing, stages of change, and therapeutic process. *Journal of Cognitive Psychotherapy*, 18: 299-308. doi: <https://doi.org/10.1891/jcop.18.4.299.64003>.
- Paolucci, S. , Gandolfo, C. , Provinciali, I, Torta, R. , Toso, V. DESTRO study group. (2006). The Italian multicenter observational study on post-stroke depression. *Journal of Neurology*, 253, 556-62.
- Paolucci, S. (2017). Advances in antidepressants for treating post-stroke depression. *Expert Opinion on Pharmacotherapy*, 18, 1011-17.
- Quinn, T. J. , Paolucci, S. , Sunnerhagen, K. S. , Sivenius, J. , Walker, M. F. , Toni, D. , & Lees, K. R. (2009). Evidence-based stroke rehabilitation: An expanded guidance document from the European Stroke Organisation (ESO) guidelines for management of ischaemic stroke and transient ischaemic attack 2008. *Journal of Rehabilitation Medicine*, 41, 99-111.

- Robinson, R. G. , & Spalletta, G. (2010) Poststroke depression: A review. *Canadian Journal of Psychiatry*; 55, 341-9. DOI:10.1177/070674371005500602.
- Rollnick, S. , Miller, W. R. , & Butler, C. C. (2008) *Motivational Interviewing in health care. Helping patients change behaviour*. New York: The Guilford Press.
- Ski, C. , & O'Connell, B. (2007) Stroke: The increasing complexity of carer needs. *Journal of Neuroscience Nursing*, 39, 172-9.
- Stroke Foundation. (2017) *Clinical Guidelines for Stroke Management*. Melbourne, Australia.
- Thabane, L. , Ma, J. , Chu, R. , Cheng, Ji. , Ismaila, A. , Rios, L. P. , Robson, R., Thabane, M. , Giangregorio, L. , & Goldsmith, C. H. (2010) A tutorial on pilot studies: the what, why and how. *BMC Medical Research Methodology*, 10, 1-10. doi: 10.1186/1471-2288-10-1.
- Van de Meent, H. , Geurts, A. C. H., & Van Limbeek, J. (2003) Pharmacologic treatment of poststroke depression: A systematic review of the literature. *Topics in Stroke Rehabilitation*, 10, 79-92.
- Watkins, C. L. , Auton, M. F. , Deans, C. F. , Dickinson, H. A. , Jack, C. I. A. , Lightbody, C. E. , & Leathley, M. J. (2007). Motivational interviewing early after acute stroke: A randomized controlled trial. *Stroke*, 38, 1004-9.
- Watkins, C. L. , Wathan, J. V. , Leathley, M. J. , Auton, M. F. , Deans, C. F. & Dickinson, H. A. (2011) The 12-month effects of early motivational interviewing after acute stroke: A randomized controlled trial. *Stroke*, 42, 1956-61. doi: 10.1161/STROKEAHA.110.602227.

Williams, L. S. , Ghose, S. S. & Swindle, R. W. (2004) Depression and other mental health diagnoses increase mortality risk after ischemic stroke. *American Journal of Psychiatry*, 161, 1090-5. doi: 10.1176/appi.ajp.161.6.1090.

Williams, L. S. , Brizendine, M. S. , Plue, L. , Bakas, T. , Tu, W. , Hendrie, H. , & Kroenke, K. (2005) Performance of the PHQ-9 as a screening tool for depression after stroke. *Stroke*, 36:635-638. Doi: 10.1161/01.STR.0000155688.18207.33.

Zigmond, A. S. , & Snaith, R. P. (1983) The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, 67, 361-70.

Table 1: Participant Characteristics

Baseline Characteristics	Intervention (n=18)	Control (n=20)
Male: N (%)	11 (68.8%)	9 (50.0%)
Age: Mean (years) (SD)	66.4 (14.9)	69.9 (12.8)
Australian-born: N (%)	10 (62.5%)	11 (61.1%)
English 1 st language: N (%)	13 (81.3%)	15 (83.3%)
Married/Partner: N (%)	11 (68.8%)	9 (50.0%)
Modified Barthel Index – Slight dependence or Independence	12 (75.0%)	13 (72.2%)

Table 2: Comparison of 1- and 3-Month Mood Outcomes

Psychometric Measures:	Intervention (n=18)			Control (n=20)		
	Baseline N=18	1-M N=17	3-M N=17	Baseline N=20	1-M N=20	3-M N=18
HADS (Anxiety) [‡]	6.7 (5.0)	5.4 (4.2)	7.1 (6.0)	7.9 (5.7)	7.9 (4.5)	6.8 (5.9)
HADS (Depression) [‡]	4.7 (3.9)	4.9 (2.7)	5.6 (5.5)	5.4 (3.6)	6.2 (4.0)	6.1 (4.0)
PHQ9 (Depression) [§]	5.8 (5.4)	4.3 (4.9)	4.6 (6.5)	6.4 (6.8)	5.7 (6.5)	4.9 (6.1)
QLI Total [¶]	22.4	28.2	27.9	21.3	26.5	27.7
QLI	- (3.3)	(3.0)	(3.4)	(5.7)	(4.1)	(3.7)
Health/Functioning	19.3	27.6	26.9	18.6	24.9	26.5
QLI – Social/Economic	(5.4)	(3.5)	(4.9)	(7.3)	(5.9)	(5.6)
QLI	- 25.2	28.9	29.1	23.6	27.9	28.5
Psychological/Spiritual	(3.1)	(2.1)	(1.7)	(5.7)	(2.9)	(2.3)
QLI - Family	24.0	28.2	27.5	22.8	26.7	28.4
	(4.2)	(4.6)	(4.3)	(6.5)	(4.8)	(3.4)
	27.0	29.1	29.8	24.9	29.6	29.6
	(3.1)	(1.9)	(0.4)	(7.1)	(1.2)	(1.1)

[‡] Hospital Anxiety and Depression Scale (HADS) (0-21, Normal range: 0-7, 2 Subscales); [§] Patient Health Questionnaire (PHQ-9) (measures depression) (0-27, Normal range: 0-4); [¶] Quality of Life Index (QLI) (measures satisfaction and importance of QOL domains) (0-30, Higher scores)

Figure 1: Session Guide

Author Manuscript

Figure 2: Consort Diagram

SESSION 1

Setting agenda and adjustment to stroke

INTRODUCTION

- Introduce yourself.
- Thank the patient for agreeing to take part in the study, and tell the patient about your role in the study.
- Give a brief but simple explanation about the study:
 - This study is about helping you to recover from stroke.*
- Explain the patient's role in the study:
 - You will come and talk to the patient on three separate occasions;
 - A different person will assist you to complete a questionnaire on three separate occasions;
 - Mention that the patient has already completed the questionnaire once.
- Tell the patient that you are about to start Session 1 of the study.

INTERVENTION

SESSION 1 - Explore how they are feeling about having a stroke

Outline	Strategies	Open questions
<ul style="list-style-type: none"> ▪ Encourage patient to talk about adjustment to stroke including physical, functional disability, social support. ▪ Discuss concerns about functional and physical disability. 	<ul style="list-style-type: none"> ▪ Encourage the patient to talk openly ▪ Listen ▪ If the patient is hesitant to talk, try using silence to encourage him/her to talk ▪ Probe answers, as necessary 	<ul style="list-style-type: none"> ▪ Can you tell me what happened leading up to the stroke? ▪ Can you tell me how you are feeling about having a stroke? ▪ You obviously have experienced some changes after the stroke; Can you tell me about these changes?; What do you expect it will be like in the future" ▪ It is common for patients in your situation to have concerns or worries after having a stroke. ▪ Do you have any concerns you want to talk about after having a stroke? (If so, ask the patient to tell you more) ▪ How do you feel about these concerns? ▪ In what way, if any, do you think these concerns might make it more difficult for you to recover from stroke?

CLOSURE

- Ask the patient if he/she has any questions he/she wants to ask.
- Thank the patient.
- Tell the patient that you will visit him/her again to complete sessions 2 and 3 of the study.

Figure 2: Consort Diagram

