Fidelity to a motivational interviewing intervention for those with post-stroke aphasia: A small scale feasibility study

Abstract

Objective: Depression after stroke is common, and talk-based psychological therapies can be a useful intervention. Whilst a third of stroke survivors will experience communication difficulties impeding participation in talk-based therapies, little guidance exists to guide delivery for those with aphasia. We need to understand how to adapt talk-based therapies in the presence of aphasia. This study aimed to explore the feasibility of motivational interviewing (MI) in people with post-stroke aphasia.

Methods: In a small-scale feasibility study, consecutive patients admitted to an acute stroke ward were screened for eligibility. People with moderate to severe aphasia were eligible. Those consenting received an intervention consisting of up to eight MI sessions delivered twice per week over four weeks. Sessions were modified using aids and adaptations for aphasia. Session quality was measured using the Motivational Interviewing Skills Code (MISC) to assess MI fidelity.

Results: Three consenting patients identified early post-stroke took part; one male and two females ages ranging between 40s to 80s. Participants attended between five to eight MI sessions over four weeks. Aids and adaptations included visual cues, rating scales and modified reflections incorporating verbal and non-verbal behaviours. Sessions were tailored to individual participant need. Threshold MISC ratings could be achieved for all participants however, ratings were reduced when aids and adaptations were not used.

Discussion: This small-scale feasibility study suggests that it is feasible to adapt MI for people with moderate to severe post-stroke aphasia. These findings merit further exploration of adapted MI as an intervention for this patient group.

Key words: Stroke; Stroke survivors; Aphasia; Motivational interviewing; Feasibility studies.

25   Introduction

26   Stroke recovery requires emotional adjustment, and depression post-stroke is common, with a third

27   of stroke survivors experiencing symptoms [1]. Post-stroke depression is an independent predictor

28   of recovery and quality of life [2], therefore early prevention and treatment is vital. A review of

29   interventions for preventing depression post-stroke found psychotherapeutic interventions to be

30   more effective than pharmacological [3]. However, talk-based therapies may need adjusting for

31   those post-stroke, who can suffer from cognitive or communication difficulties. Whilst a third of

32   stroke survivors will experience communication difficulties [4] impeding participation in talk-based

33   therapies, little guidance exists on delivery in people with aphasia. We need to understand how to

34   adapt talk-based therapies in the presence of aphasia.

35   Motivational interviewing (MI) is a talk-based therapy that has been shown to benefit patient mood

36   post-stroke [5]. MI principles were used to increase awareness of the importance of changing what

37   people make of their situation (adjustment), through amplifying the discrepancy between their

38   current concerns and future goals or personal values and current approaches to addressing them. By

39   reducing ambivalence and strengthening motivation, therapists explore a person's reason for

40   changing what they make of their situation. Confidence to adjust to their current state is reinforced

41   through supporting self-efficacy, enabling the person to develop motivation, and creating readiness

42   to adjust [6]. Specific MI consistent techniques allow delivery of these principles; asking open

43   questions, reflecting statements, providing affirmations and summarising. MI inconsistent

44   techniques include, confronting people or giving advice without permission. Whilst data from this

45   study seemed to indicate a particular benefit for those with mild aphasia [5], it is unclear whether it

46   is possible in those with moderate to severe aphasia. Furthermore, if the delivery of MI needs

47   adjustments, it is not known whether an adapted form of MI can maintain core MI principles.

48   MI has previously been adapted for other populations including learning disabilities [7]. A pilot study

49   of people with learning disabilities and alcohol dependency who experienced communication

50   difficulties, incorporated adaptations including reading aloud materials for those unable to read, and

51   providing regular summaries of topics discussed. Visual analogue scales were used to rate the

52   importance of, or confidence in, a topic; an MI strategy usually discussed verbally. These aids and

53   adaptations improved patients' understanding. While the delivery of MI with people with learning

54   difficulties may differ to those experiencing post-stroke aphasia, some adaptations used may be

55   useful post-stroke.

56   More widely, methods to facilitate the participation of people with communication difficulties in

57   research has involved using words and/or pictures to visualise information [8], incorporating non-

58   verbal behaviour, simplifying questions, supporting comprehension and expression, checking that

59   participants have been understood correctly [9] and training communication partners [10]. Aids and

60   adaptations can facilitate communication for people who may struggle verbally, making it possible

61   for people with aphasia to participate in a talk-based therapy. To date, despite data suggesting a

62   potential benefit of MI to people with aphasia post-stroke [5], no study has explored the feasibility

63   of how to adapt MI for this group.

64   A systematic review of interventions to prevent and treat depression in those with post-stroke

65   aphasia [11] found various interventions that could be considered for those with sub-threshold to

66   mild depression. However, the review highlighted a need to strengthen the evidence base and adapt

67   preventative and treatment interventions. In order to do this, trials must be reported in a way that

68   allows study replication and comparisons [11, 12]. However when adapting talk-based therapies, it is

69   important that the adapted intervention maintains fidelity to the core principles of the therapy.

70   Treatment fidelity builds confidence that changes to the dependent variable are attributable to the

71   independent variable, in this case the talk-based therapy. This can be measured using various factors

72   (design, training, delivery, receipt and enactment) [12].

73   This small-scale study aimed to explore the feasibility of delivering MI to people with moderate to

74   severe post-stroke aphasia. This was achieved through two objectives, i) documenting the aids and

75   adaptations utilised, and ii) observing how the utilisation of aids and adaptations affects MI fidelity.

76   The study did not explore the impact of MI on mood outcomes.

77

78   Methods

79

80   Ethical approval was granted (August 2012) from National Research Ethics Service: North-West –

81   Preston. The feasibility study was nested within a larger study, performed on an acute stroke unit

82   (ASU). The larger study explored delivering MI in patients with no or mild communication difficulties

83   post-stroke and not those with moderate to severe aphasia. Consecutive people with suspected

84   stroke admitted to the ASU May-December 2013 were screened for eligibility. People were eligible

85   if: aged 18 or over; diagnosis of stroke; medically stable; moderate to severe aphasia based on the

86   Communication Observational Assessment Tool, (COAT) [13], capable of consent; and living within

87   the hospital catchment. Patients were ineligible if they were receiving psychological input (receiving

88   treatment from a psychology professional) or had no verbal expression. Patients with mild

89   communication difficulties were excluded but would have been eligible for the larger study.

90   Formal screening for communication ability was not standard practice on the ASU. To screen for the

91   study, an observational tool was required which was i) non-invasive to the patient, ii) for clinical

92   team use, and iii) able to categorise communication ability through routine observations. The COAT

93   was used (See Appendix 1), based on Speech and Language Therapist (SLT) guidance allowing clinical

94   staff (therapy or nursing) to screen to rate communication using five levels (none/ mild/ moderate/

95   moderately severe/ severe communication difficulties).

96   Purposive sampling was utilised to recruit patients with a range of communication abilities. We

97   aimed to select 6-12 people across the three communication levels (*Severe/ Moderately severe/*

98   *Moderate)*, with equal numbers from each. People meeting eligibility criteria were approached by

99   the stroke research nurse or research assistant. Aphasia-friendly study information and consent

100   forms (Appendices 2 and 3) were provided , based on guidance [14,15]. Consent was taken by the

101   stroke research nurse, with written informed consent provided, or witnessed consent for those

102   unable to write.

103   Participant demographic and stroke details were recorded. Baseline measures of functional

104   dependence (Barthel, [16]),communication and mood were completed. Communication was

105   assessed using the Frenchay Aphasia Screening Test (FAST, [17]) and the Comprehensive Aphasia

106   Test (CAT, [18]), the results of which guided the choice of aids and adaptations to tailor

107   communication and MI delivery. Mood was measured using two participant self-report tools, the

108   DISCS [19] and Yale [20] with a score of 2 or more and 1 respectively indicating low mood. Where

109   possible, carer-rated mood measures were administered using the Stroke Aphasic Depression

110   Questionnaire-10 [21] and Signs of Depression Scale [22], with cut-points of 14 and 2 respectively

111   indicating low mood.

112   Intervention design
113   Participants received up to eight sessions of MI, two half-hour sessions per week for four weeks.

114   Session duration and frequency were adapted from the four one-hour sessions in the original trial of

115   MI in stroke [5] to lessen the cognitive demand and fatigue from engaging in MI. Sessions were video

116   and audio-recorded, allowing therapists to later reflect on the session, prepare for the next session,

117   and monitor consistency of technique. MI sessions were delivered by the same therapist, in hospital

118   or at home according to participant choice post-discharge. Post-intervention, participants received

119   usual care.

120   MI therapists
121   Three Therapy Assistants (TAs) from the ASU multi-disciplinary team received training covering:

122   stroke foundations, core research principles, theoretical background to MI and the psychological

123   mechanisms that effect change, and practical MI training, delivered by MI therapists from the

124   original MI post-stroke trial [5], who also provided supervision.. The training lasted one day per week

125   for nine weeks, including independent learning sessions. This was followed by a minimum of ten

126   practice MI sessions with volunteers. Therapists delivered MI with patients with no or mild

127   communication difficulties post-stroke, until confidence and threshold competency were achieved,

128   assessed with the MI Treatment Integrity (MITI) Code [23]. Therapists were provided with an

129   intervention manual, allowing them to monitor their delivery and increase the likelihood that the

130   intervention was delivered as intended.

131

132   Aids and adaptations

133   Aids were physical prompts used to facilitate conversation, whilst adaptations were alterations to

134   the delivery of spoken information. The aids utilised included a communication framework Talking

135   Mats® [24] a simple low-tech method of facilitating communication; a set of cards each with a

136   written word and a corresponding picture. Nine category cards provide a starter topic of

137   conversation (domestic life, relationships, work and education, leisure, learning and thinking, ways

138   of coping, communication, mobility, and self-care). For each category, an accompanying set of cards

139   allows further exploration of each topic. Cards are used (thumbs up, thumbs down, unsure) to

140   indicate response. People may include their own cards (e.g. picture of an activity or relative).   The

141   "ways of coping" cards reflecting different emotions, were used to respond to other category cards.

142   Cards are moved around the mat to express thoughts on a topic. While Talking Mats® may not be

143   suitable for all participants; it has previously been used successfully in people with post-stroke

144   aphasia [25], and was a useful resource to initiate conversations. Ahead of MI sessions, a single

145   Talking Mats® training session was provided by the researcher; however tailoring this to patient

146   needs was guided by the SLT.

147   A second aid utilised was the visual rating scale (VRS); a vertical scale where participants rated a

148   response from 0-10. This was used to establish the level of importance or confidence around an

149   issue. Finally, a photo-book was used as a conversation starter, and pen and paper were available for

150   participants or therapists to use as necessary.

151

152   Data analysis

153   Video and audio footage were uploaded and synchronised in NVivo 10. Data were analysed to

154   document the use of aids and adaptations, incorporating verbal and non-verbal information. Video

155   footage was annotated and audio data was transcribed and coded. The MI Skills Code (MISC, Version

156   2.1, [26]) was used instead of the MITI to evaluate therapist MI competence and fidelity (MI

157   consistency), participant behaviours (patient engagement), and the interaction between the two

158   (therapist and patient collaboration), thus offering a more detailed analysis than the MITI as the

159   latter two are not included in the MITI.

160   The MISC was developed to analyse specific therapist behaviours, evaluating therapist adherence to

161   MI principles (fidelity). Two aspects of MI delivery are assessed: Global ratings and individual

162   utterances. Global ratings take a holistic view of MI sessions, establishing more broadly whether

163   there is adherence to the 'spirit' of MI. MISC global ratings reflect MI spirit, empathy, acceptance,

164   egalitarianism, genuineness and warmth. Scores range from 0-7 (higher scores indicating greater

165   adherence) and provide an overview of MI principles demonstrated in each session. Global ratings

166   allow evaluation of i) the therapist's performance, ii) the person's involvement, and iii) the

167   collaboration between therapist and person. This indicates the therapeutic alliance established.

168   Therapist's individual utterances are used to calculate the proportion of MI consistent responses. A

169   second researcher independently coded half of the sessions for global MISC ratings to validate

170   interpretation. To calculate the overall proportion of MI consistent utterances per session, each

171   therapist utterance was coded as MI consistent (MICO) or MI inconsistent (MIIN). Therapist

172   competence is established following MISC guidelines [26] which recommends minimum therapist

173   proficiency levels to achieve 'expert' or 'threshold' scores (for experienced or novice therapists

174   respectively). To reach threshold competency, therapists must achieve over five in global ratings and

175 80% MICO utterances. Expert level should achieve over six for global ratings and 90% MICO

176 utterances .

177

Results

179 Between May-December 2013, 201 patients with suspected stroke were screened for eligibility.

180 Eleven were eligible and three consented to participate. A summary of screening and recruitment

181 data is presented in Figure 1.

182 >>>>Insert Figure 1 here<<<<

183 Due to staff attrition, one therapist was the sole provider of MI to the study. The therapist divided

184 her time between her role as MI therapist and therapy assistant supporting SLT and dietetics stroke

185 teams. The therapist had experience of working with people with aphasia utilising aspects of

186 supported conversation, however formal communication training was not provided.

187
188

189 Demographic information and baseline measures
190

191 Demographic information for the three participants is presented in Table 1. At baseline, participants

192 varied in level of aphasia, with participant 1 scoring considerably lower than other participants 2 on

193 all communication measures. Participants differed in functional ability, level of social support

194 (separated/married/widow), and post-stroke role change (working/social/family). No participant

195 screened as having low mood, as seen in Table 2.

196 >>Insert Table 1 here<<

197 Insert Table 2 here

198   Details of the MI intervention received are shown in Table 3. Participants began MI within 2-12

199   weeks post-stroke, attending between 5-7 sessions.

200   Insert Table 3 here

201   Aids and adaptations utilised in MI sessions
202

203   Aids and adaptations used to facilitate communication, incorporating both verbal and non-verbal

204   information were identified. Talking Mats® was particularly useful for enabling open questions and,

205   through moving the appropriate card on to the mat, the participant was able to respond without

206   relying on verbal or written communication alone. Talking Mats® was introduced to all participants,

207   however only the participant with severe aphasia utilised this aid frequently. Talking Mats® cards

208   were supplemented with pictures relevant to the participant in order to illustrate an idea, for

209   example, using a picture of a care home the participant had recently visited.

210   The VRS, although initially intended for use in establishing the participant's level of importance or

211   confidence of an issue was also employed by participants to respond to open questions. For

212   example, to demonstrate how they felt about staying in hospital (low for dislike, higher indicating

213   positivity).

214   Each participants' photo-book showed key aspects of their life, including family, pets, or holidays.

215   The photo-book acted as a conversation starter for participant 1 in particular (severe aphasia),

216   prompting discussion of home life and family. The participant with moderately severe aphasia used

217   an aid of pen and paper, providing her with multiple routes to communicate.

218   SLT guidance included supportive conversation techniques, such as employing a slow pace of

219   conversation, and allowing adequate time for participants' responses. The therapist also used aids to

220   enhance the patient's understanding, including pointing to pictures or words that were being

221   discussed to reinforce the message such as writing key words as they are discussed. Gesture was

222 used by both therapist and participants, providing multiple methods to convey the same

223 information. MI adaptations involved using increased reflections, including reflections of non-verbal

224 information e.g. information conveyed through gesture. Summaries allowed participants to maintain

225 focus on the conversation whilst simultaneously providing an opportunity for the therapist to ensure

226 they had understood the participant. Table 4 highlights the MI strategies used.

227 >>Insert Table 4 here<<

228 The impact of adaptations on MI fidelity
229

230 A second researcher independently coded half of the sessions for global MISC ratings to validate

231 interpretation. Full agreement of ratings or a one-point difference was achieved for 93%. A two-

232 point difference occurred in 7% of ratings, and each was discussed until a consensus was reached.

233 Therapist levels of MI fidelity varied across sessions from sub-threshold to expert level. This variation

234 in MI fidelity was most prominent in sessions delivered with participant 1, who had severe aphasia.

235 A higher level of MI fidelity was applied with participants 2 and 3; with most sessions reaching

236 expert level.

237 The MI ratings are displayed in Table 5. It was expected that the therapist should reach a minimum

238 of threshold level (over five in global ratings / 80% MICO utterances) however for participant 1

239 (severe aphasia), therapist MI ratings varied from below threshold to expert level.

240 Participant 2 (moderately severe aphasia) therapist MISC ratings were good, with all sessions

241 reaching threshold level and many sessions reaching expert level (over six for global ratings / 90%

242 MICO utterances). Participant MISC ratings reached expert level for all sessions except one session

243 which achieved threshold level indicating strong engagement.

244 Participant 3 (moderate aphasia) therapist MISC ratings for participant were also good, with the

245 therapist reaching threshold level in all sessions, and some sessions reaching expert levels. All

246   patient MISC ratings reached expert level, indicating both therapist and participant were positively

247   engaged with a strong therapeutic alliance.

248   >>Insert Table 5 here<<

249   To draw attention to the potential impact of aids and adaptations on the MI content, a summary of

250   sessions with participant 1 (severe aphasia) is shown in Table 6.

251   >>Insert Table 6 here<<

Discussion

253   MI has previously been used to prevent depression post-stroke [5]; however, this is the first study to

254   provide support for the feasibility of delivering MI adapted for those with moderate to severe post-

255   stroke aphasia. While involving only a small number of participants, this study has demonstrated

256   that when MI sessions were adapted to meet the needs of those with aphasia, MI principles and

257   fidelity can be achieved. The MI therapist was able to reach threshold levels of MI fidelity, which was

258   demonstrated through both MI consistent utterances and global ratings. Expert levels were achieved

259   in some sessions, as is highlighted in Tables 4 and 5.

260   The therapist was able to maintain high levels of MI fidelity with participants with less severe

261   aphasia (participants 2 and 3), however, struggled to maintain this level across sessions with

262   participant 1 (severe aphasia). This is evident when comparing individual sessions for participant 1

263   (Table 5). Session 3 is the highest rated for MI consistency and spirit. The visual rating scale (VRS)

264   was used 14 times, which may have facilitated 17 open questions. Closed questions were used 49

265   times; however, these are often required for people unable to provide more in-depth verbal

266   responses. Therapist and participant MISC global ratings and overall MI fidelity both reached expert

267   level, and MI inconsistent responses are low (n=3) indicating a successful session. In contrast, session

268   5 has a sub-threshold level of MI. The VRS was used five times, with only 2 open questions

269   facilitated, and 131 closed questions used. Ratings for participant engagement and collaboration are

270   low, with a higher number of MI inconsistent responses (n=17).

271   Aids and adaptations may have facilitated MI techniques, such as open questions and reflections,

272   and consequently the delivery of MI. When aids and adaptations were not used, participants were

273   limited in the information they could communicate. The therapist's ability to tailor sessions for

274   participant 1 (severe aphasia) appeared to impact on MI fidelity as well as participant engagement.

275   However, it may not be that the use of aids and adaptations were responsible for the change in the

276   ability to maintain MI principles. Other factors, including changes in circumstance experienced may

277   have impacted on sessions. The participants experienced varying degrees of life changes post-stroke,

278   including level of physical disability, social support, role change, and consequently had different

279   issues to adjust to. Participant 1, who had multiple significant changes following the stroke, may

280   have been more challenging for the therapist to engage with, than those with fewer or less

281   significant issues to adjust to.

282   Previous MI trials were often limited by their lack of documentation to explain what intervention

283   was delivered [27], reducing validity and replicability. In order to adequately demonstrate treatment

284   fidelity [12, 27, 28] in this study, a range of issues were considered and documented, including:

285   session number, duration and content; therapist background, training and support; MI delivery and

286   adherence to MI principles. The accurate reporting of delivering adapted MI may be particularly

287   important to ensure transparency of what intervention has truly been delivered. Failure to do so,

288   particularly in MI trials, has been highlighted as problematic [29].

289   The small number of participants limited the study, restricting our understanding of the impact of

290   adaptations and a more informative analysis may have been possible with participants with a

291   broader range of communication difficulties. A larger scale study may wish to investigate this

292   further, and may consider using multiple therapists to deliver MI to further our knowledge of the

293   impact of the therapist in this complex relationship.

294   The feasibility study indicates that the delivery of MI to those with post-stroke aphasia has potential

295   for future development. This study has implications for talk-based therapies post-stroke, in

296   particular for those who may struggle to engage in standard talk-based therapies. Adapted MI could

297   offer a form of psychological support that is not currently delivered.

298

Conflict of interest

300   None declared

References

1. Hackett, M.L. and K. Pickles, Part I: Frequency of Depression after Stroke: An Updated Systematic Review and Meta-Analysis of Observational Studies. *International Journal of Stroke*. 2014; 9(8): 1017-1025.

2. Donnellan C, Hickey A, Hevey D, and O'Neill D. Effect of mood symptoms on recovery one year after stroke. I*nt J Geriatr Psychiatry.* 2010*;* 25(12): 1288-1295.

3. Hackett ML, Anderson CS, House A, Halteh C. Interventions for preventing depression after stroke. *Cochrane Database of Systematic Reviews*. 2008;(3).

4. Kauhanen ML, Korpelainen JT, Hiltunen, P, et al. Aphasia, depression, and non-verbal cognitive impairment in ischaemic stroke. *Cerebrovasc Dis.* 2000; 10(6): 455-461.

5. Watkins CL, Auton MF, Deans CF, et al. Motivational interviewing early after acute stroke: a randomized, controlled trial. *Stroke.* 2007; 38(3): 1004-1009.

6. Miller W and Rollnick R. The effectiveness and ineffectiveness of complex behavioral interventions: Impact of treatment fidelity. *Contemp Clin Trials.* 2014; 37: 234-241.

7. Mendel E and Hipkins J. Motivating learning disabled offenders with alcohol-related problems: a pilot study. Brit J Learn Disabil. 2002; 30(4): 153-158.

8. Pearl G and Wade R. Facilitating the Involvement of People with Aphasia in Stroke Research by Developing Communicatively Accessible Research Resources. *Top Lang Disorders.* 2017; 37(1): 67-84.

9. Dalemans R, Wade DT, van den Heuvel WJ, and de Witte LP. Facilitating the participation of people with aphasia in research: a description of strategies. *Clin Rehabil.* 2009; 23(10): 948-959.

10. Simmons-Mackie N, Raymer A, Cherney L. Communication Partner Training in Aphasia: An Updated Systematic Review. *Arch Phys Med Rehabil.* 2016; 97: 2202-2221.

11. Baker C, Worrall L, Rose M, Hudson K, Ryan B, and O'Byrne L. A systematic review of rehabilitation interventions to prevent and treat depression in post-stroke aphasia. *Disabil Rehab.* 2017. http://dx.doi.org/10.1080/09638288.2017.1315181

12. Borrelli B, Sepinwall D, Ernst D, Bellg AJ, Czajkowski S, Breger R, DeFrancesco C, Levesque C, Sharp DL, Ogedegbe G, Resnik B and Orwig D. A new tool to assess treatment fidelity and evaluation of treatment fidelity across 10 years of health behavior research. *J Consult Clin Psychol*. 2005;73(5):852–60.

13. Holland EJ. *The feasibility of delivering motivational interviewing those with communication difficulties following a stroke*. Unpublished PhD thesis. University of Central Lancashire. 2009.

14. *Engaging with people who have aphasia. A set of resources for stroke researchers*. National Institute for Health Research. Clinical Research Stroke Network (NIHR CRN: Stroke). 2014.

15. Rose TA, Worrall L, Hickson LM, and Hoffman TC. Aphasia friendly written health information: content and design characteristics. *Int J Speech Lang Pathol*. 2011; Aug;13(4):335-47. doi: 10.3109/17549507.2011.560396.

16. Wade DT and Colin C. The Barthel ADL Index: a standard measure of physical disability? *Int disabil Stud.* 1988; 10(2): 64-7.

17. Enderby PM, Wood VA, Wade DT, and Hewer RL. The Frenchay Aphasia Screening Test: a short, simple test for aphasia appropriate for non-specialists. *Int Rehabil Med* 1987; 8(4): 166-170.

18. Swinburn K, Porter G, and Howard D. *CAT: comprehensive aphasia test.* Psychology Press: Hove; 2004.

19. Turner-Stokes L, Kalmus M, Hirani D, and Clegg F. The Depression Intensity Scale Circles (DISCs): A first evaluation of a simple assessment tool for depression in the context of brain injury. *J Neurol, Neurosurg Psychiatry.* 2005; 76(9): 1273-1278.

20. Mahoney J, Drinka TJ, Abler R, Gunter-Hunt G, Matthews C, Gravenstein S and Carnes M. Screening for depression: single question versus GDS. *J Am Geriatr Soc.* 1994; 42(9): 1006-1008.

21. Sutcliffe L and Lincoln N. The assessment of depression in aphasic stroke patients: the development of the Stroke Aphasic Depression Questionnaire. *Clin Rehabil*. 1998; 12(6): 506-513.

22. Hammond MF, O'Keeffe ST, and Barer DH. Development and validation of a brief observer-rated screening scale for depression in elderly medical patients. Age Ageing. 2000; 29: 511–15.

23. Moyers T, Martin T, Manuel JK, and Miller WR. *The Motivational Interviewing Treatment Integrity (MITI) Code: Version 2.0.* University of New Mexico: Center on Alcoholism, Substance Abuse and Addictions; 2005.

24. Murphy J. Talking Mats: speech and language research in practice. *Speech and Language Therapy in Practice.* Autumn 1998: 11–14.

25. Murphy J. Enabling people with aphasia to discuss quality of life. *BJTR.* 2000*;* 7(11): 454-458.

26. Miller WR, Moyers TB, Ernst D, Amrhein P. *Manual for the motivational interviewing skill code (MISC) Version 2.1*. 2008. Retrieved from http://casaa.unm.edu/download/misc.pdf.

27. Rollnick S. Comments on Dunn et al's "The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review". Enthusiasm, quick fixes and premature controlled trials. *Addiction.* 2001:96(12):1769–1770.

28. Hinckley JJ, and Douglas NF. Treatment fidelity: its importance and reported frequency in aphasia treatment studies. *Am J Speech Lang Pathol*. 2013; 22: S279-S284

29. Miller WR and Rollnick S. The effectiveness and ineffectiveness of complex behavioural interventions: Impact of treatment fidelity. Contemp Clin Trials. 2014; 37: 234–241.

Table 1. Demographic information and baseline scores of communication, cognition and functional dependence

	Participant 1	Participant 2	Participant 3
Sex	Male	Female	Female
Age	44	65	87
Screening measure			
Level of communication difficulty (COAT)	Severe	Moderately Severe	Moderate
Communication: FAST (max. 30)	1	23	16
CAT expression: Repetition	0/50, 0/74	27/50, 54/74	20/50, 38/74
Naming	0/29, 0/58	16/29, 29/58	13/29, 24/58
Reading	0/35, 0/70	26/35, 56/70	27/35, 54/70
Written Language	0/76	54/76	49/76
CAT Comprehension of written language	10/62	52/62	46/62
Comprehension of spoken language	15/66	52/66	56/66
CAT Cognitive screen	9/38	37/38	30/38
Functional dependence: Barthel (max 20)	4	20	19

*COAT= Communication Observational Assessment Tool, FAST=Frenchay Aphasia Screening Test,

CAT=Comprehensive Aphasia Test,

Table 2. Baseline mood scores

Mood tool	Participant 1	Participant 2	Participant 3
Yale single-item	0	0	0
DISCs (max. 5)	0	1	1
SODS	Not available	1	1
SADQ-10	Not available	8	12

Yale single-item (cut-off 1), DISCs=Depression Intensity Scale Circles (cut-off 2), SODS=Signs Of Depression

Scale (cut-off 2)), SADQ-10=Stroke Aphasic Depression Questionnaire-10 (cut-off 14).

Table 3. Details of Motivational Interviewing intervention received

	Participant 1	Participant 2	Participant 3
Number of MI sessions received	5	8	7
Time from stroke to first MI session (weeks)	12	2.5	4
Duration of intervention (weeks)	7	5	5
Length of sessions in minutes Mean (range)	21 (16-30)	23 (18-29)	29 (13-40)

1 Table 4. Session communication strategy and MISC code ratings

Participant	Total no. of sessions	Use of VRS Median (range)	Open questions: Median (range)	Closed questions: Median (range)	Summaries: Median (range)	Reflections: Median (range)	Affirmations: Median (range)	Overall MI consistency** (%) range
1	5	5 (2-14)	8 (2-17)	72 (49-131)	1 (0-7)	19 (10-28)	6 (2-12)	71-95
2	8	1.5 (0-6)	4.5 (3-12)	26 (18-78)	2 (0-7)	21 (10-26)	2 (0-8)	93-100
3	7	1 (0-4)	2.5 (0-8)	21.5 (6-28)	2.5 (1-9)	10 (3-14)	2.5 (0-8)	88-100

2 **MI consistent utterances scored 0-100%, with over 80% reaching threshold level and over 90% for expert level.

3

4   Table 5. Patient MISC and overall MI consistency ratings

Participant	Total no. of sessions	Therapist MI spirit rating*: Median (range)	Patient engagement rating*: Median (range)	Therapist & Patient collaboration rating*: Median (range)	Overall MI consistency** (%) (range)
1	5	4 (4-6)	6 (4-6)	5 (3-5)	71-95
2	8	6 (5-6)	6 (5-6)	5 (5-6)	93-100
3	7	5.5 (5-6)	6 (6-7)	5.5 (5-6)	88-100

5   *Global ratings scored from 0-7, with scores over 5 reaching threshold level and over 6 for expert level

6   **MI consistent utterances scored 0-100%, with over 80% reaching threshold level and over 90% for expert level.

7

Sess.	Use of VRS	Open questions	Closed questions	Reflections	Summaries	Therapist MI spirit rating*	Patient engagement rating*	Therapist & patient collaboration rating*	MI inconsistent responses ** %	MI consistent responses ** %	Overall MI consistency ** %
1	3	8	72	19	7	4	5	4	5	38	88
2	7	13	59	18	0	4	6	5	5	44	90
3	14	17	49	25	1	6	6	5	3	52	95
4	2	5	99	10	0	4	6	5	15	37	71
5	5	2	131	28	4	4	4	3	17	44	72

Sess.= Sessions, VRS=Visual rating scale. * Global ratings scored from 0-7, with scores over 5 reaching threshold level and over 6 for expert level.**MI consistent utterances scored 0-100%, with over 80% reaching threshold level and over 90% for expert level.

Appendix 1. The Communication Observation Assessment Tool

Communication Observation Checklist (Please Tick One)

WS2	Please Tick		Please Tick
Level 1: **No Observed Difficulties**		Level 2: **Mild Communication Problems** -reduced verbal expression and fluency -speaks in sentences -may have occasional word finding difficulties -able to have a conversation -engages in turn taking	
WS3			
Level 3: **Moderate Aphasia** -may speak in phrases -may be able to use longer sentences -may have occasional word finding difficulties -sound substitution errors may occur		Level 4: **Moderately Severe Aphasia** -poor expression using only short phrases or single words	
Level 5: **Severe Aphasia** -unable to speak in phrases -severe word finding difficulties -reduced expression due to dysarthria only -someone who relies purely on gesture or a communication chart to communicate			

14 *It should be noted that only categories 3-5 were relevant to the nested feasibility study, and levels 1 and 2
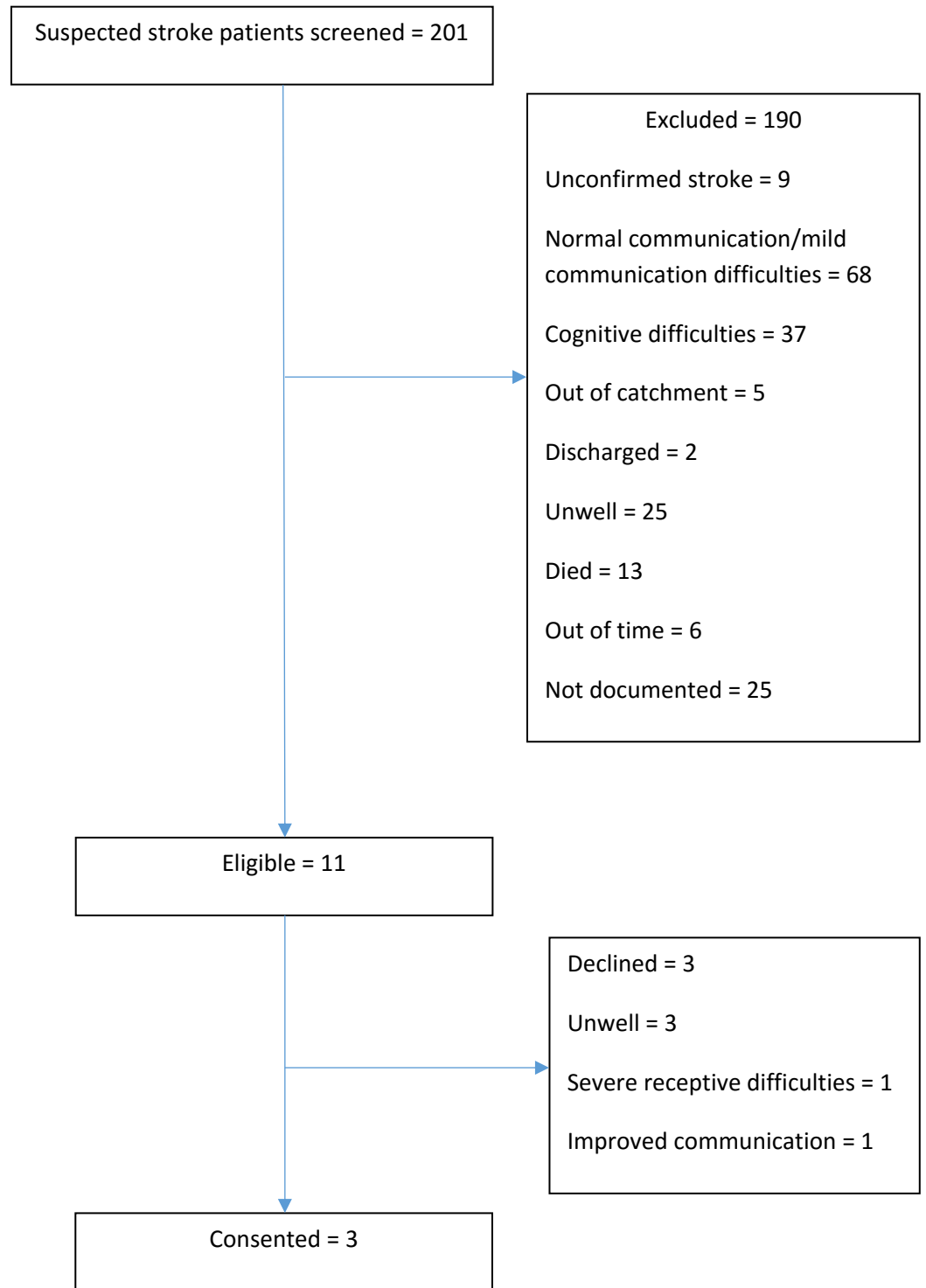
15 pertained to the larger scale study.*

Figure 1: Screening and recruitment to the feasibility study