Measures and outcomes of a psychosocial group approach in Rwanda

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CHAPTER 7

IN SEARCH OF LINKS BETWEEN SOCIAL CAPITAL, MENTAL HEALTH AND SOCIO THERAPY: A LONGITUDINAL STUDY IN RWANDA

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Submitted
ABSTRACT

To date, reviews show inconclusive results on the association between social capital and mental health. Evidence that social capital can intentionally be promoted is also scarce. It has been suggested that promotion of social capital may impact post-conflict recovery both through increased social cohesion and through better mental health. However, those few studies on community interventions and social capital have relied on cross-sectional study designs. We present a longitudinal study in northern Rwanda on the effect of sociotherapy, a community-based psychosocial intervention. Sociotherapy has been shown to improve mental health. This study looked into which elements of social capital can be promoted by sociotherapy, and how these are related to mental health. We used a prospective, quasi-experimental study design with measurement points pre and post intervention and at eight months follow-up. One hundred adults in the experimental condition entered the study. We selected a control group of hundred respondents with similar age, sex and symptom score distribution from a random community sample in the same region. Mental health was assessed by use of the Self Reporting Questionnaire (SRQ-20). Social capital was assessed by use of a locally adapted version of the short Adapted Social Capital Assessment Tool (Short A-SCAT). The instrument measures three elements of social capital: cognitive social capital, support, and civic participation. Latent growth models were used to examine whether the effects of sociotherapy on mental health and social capital were related. Both mental health and civic participation improved over time in the intervention group, but not in the control group. Although mental health and civic participation were correlated at baseline, linear changes over time were not significantly correlated. Support and cognitive social capital did not show consistent changes over time. The intervention promoted both mental health and civic participation, but these effects were independent within our sample.

Keywords: Social capital, mental health, sociotherapy, latent growth modeling, Rwanda

INTRODUCTION

Social capital

Social capital is a concept based on the idea that social networks provide a basis for social cohesion and cooperation. It has been characterized as ‘the glue that holds societies together’ (McKenzie, 2002). Social capital’s most commonly adopted definition in health sciences recognizes five characteristics: community networks, civic engagement, civic identity (belonging, solidarity, equality), reciprocity and norms of cooperation, and trust in the community (Putnam, 1993). Within the literature, studies distinguish between individual and collective conceptualizations of social capital (Kawachi & Subramanian, 2006), but the definition as a community asset is currently “privileged” over individual definitions.
Social capital has been divided into two components, ‘structural social capital’ and ‘cognitive social capital’. Structural social capital refers to the existence of relationships, networks, and associations that link members together. Cognitive social capital is the ‘driving force’; it includes values, norms, civic responsibility, expected reciprocity, charity, altruism, and trust. Structural and cognitive social capital, respectively, can be characterized as what people ‘do’ and what people ‘feel’ in terms of social relations (Harpham et al, 2002).

**Promotion of social capital**

Until recently, the few existing studies on community interventions aiming to improve social capital, tended to rely on cross-sectional study designs. This implies that their ability to draw causal inferences has been limited (Macinko & Starfield, 2001; de Silva et al, 2005). Only very few longitudinal studies evidence that social capital can be fostered by interventions. Coletta and Cullen (2000) discussed changes in social capital resulting from violent conflict in their study of four conflict-affected countries (Cambodia, Rwanda, Guatemala, and Somalia); they provide clear examples of how governments and international actors promote decentralization, civic participation, social inclusion, empowerment, and the strengthening of grassroots movements. A study by Michael and colleagues (2008) showed social support and self-rated health improved, while depressive symptoms decreased, after a community-based participatory research intervention, which employed Community Health Workers who used popular education to identify and address health disparities in Latino and African American communities in a metropolitan area in the United States.

Brune and Bossert (2009) performed a longitudinal study in Nicaragua, showing that systematic interventions promoting management and leadership development were effective in improving some aspects of social capital, in particular the cognitive attitudes of trust in the communities. Interventions were also linked to higher levels of civic participation in governance processes. As in other empirical studies, they also found that higher levels of social capital were significantly associated with some positive health behaviours.

Pronyk and colleagues (2009) conducted an intervention in rural South-Africa that combined group-based microfinance with participatory gender and HIV training in an attempt to catalyze changes in solidarity, reciprocity and social group membership as a means to reduce women’s vulnerability to intimate partner violence and HIV. After two years, adjusted effect estimates indicated higher levels of structural and cognitive social capital in the intervention group than the comparison group, although confidence intervals were wide.

**Social capital and mental health**

Social capital may play a role in the incidence and prevalence of mental illness (McKenzie et al, 2002). The assumed relevance of social capital for mental health has been underscored by national and international policies to develop social capital in disaster- or war-affected communities (Hobfoll et al, 2007; Norris et al, 2008). Over the last decade literature on the salutary association between social capital and mental health is growing (Kawachi & Berkman, 2001; Almedom, 2005; De Silva et al, 2005; Engström
et al, 2008; Berry & Welsh, 2010; Hamano et al, 2010; Suzuki et al, 2010; Wind et al, 2011). However, systematic reviews of quantitative studies examining the association between social capital and mental illness have shown inconclusive results (De Silva et al, 2005; Islam et al, 2006). Especially studies that conceptualized social capital as a community asset (as opposed to an individual asset) found ambiguous associations with individual mental health outcomes (De Silva et al, 2005; Eriksson, 2011). There has been little empirical research to assess whether social capital at community level is associated with individual mental health (Hamano, 2010). At the individual level, several studies have observed positive associations with better mental health (Veenstra 2000, 2002; De Silva et al, 2005; Whitley & McKenzie, 2005; Almedom, 2005; Irwin et al, 2008; Patel, 2010). Various scholars (Wang et al, 2009; Nakhaie & Arnold, 2010; Wind & Komproe, 2012) assert that the time has come to shed more light on possible associations between mental health and social capital, and which specific starting points are most important for interventions.

**The present study**

The study presented here was performed within the framework of a psycho-social community intervention (community based sociotherapy) aimed to enhance social bonding (Richters et al, 2005). Sociotherapy has been shown to establish a significant improvement in mental health in Byumba, Rwanda (Scholte et al, 2011a).

Byumba province is located in the north of Rwanda, bordering Uganda. The invasion by the Rwanda Patriotic Front (RPF) from Uganda into Rwanda on 1st October 1990 started a civil war in the north of the country. The RPF went into Rwanda as an army of liberation but was perceived by the majority of the population as an army of occupation. Low intensity fighting was interrupted by several massacres, including one in Byumba. During the 1994 genocide, social capital atrophied as the country, communities and families fell prey to hatred and violence (Colleta & Cullen, 2000). The war (1990-1994) and genocide (1994) related problems affected men and women of all ages. The population experienced atrocities like killings, sexual violence, torture, intimidation, robbery, destruction of property, and social rejection, leaving the community in a state of trauma. A relatively large part of the population came to consist of widows, widowers, orphans, physically handicapped, prisoners and ex-prisoners (Richters et al, 2005; Richters et al, 2008).

Clearly, after years of war and genocide, Rwanda is a context where social fabric has been seriously damaged, which implies low social capital. Before the genocide, potential bridging social capital existed in the form of exchange, mutual assistance and reciprocity (Colleta & Cullen, 2000). The ‘success’ of the genocide depended in part on civilians’ sense of civic duty and on the historical strength of the central government. Vertical social capital, manifested in almost absolute state power, had historically penetrated Rwandan society so deeply as to supersede horizontal relations or loyalties. The violent conflict destroyed whatever broad-based forms of social capital had existed.

To our knowledge, this is the first study aiming to establish possible links between social capital and mental health by use of a longitudinal design. We measured social capital at the individual level, and looked into what elements of social capital were promoted by the community-based sociotherapy program in Rwanda, and if these elements
were salutary for mental health. First, we performed a factor analysis of the scores on the instrument used to measure social capital, in order to distinguish the relevant elements of social capital. Then we explored the change over time in these elements, and examined the relationship between the changes in mental health and social capital. Latent growth models (LGM) were used to examine whether the effects of sociotherapy on mental health were related to the effects of sociotherapy on social capital.

METHODS

Data were collected at the start of the intervention (October 2007: T0), directly after (January 2008: T1), and at eight months follow-up (September 2008: T2). Demographic data (sex, age, education level and socio-economic status) were documented.

Intervention

The sociotherapy programme was set up in collaboration with the Episcopal Church of Rwanda (ECR), funded by the development organization Cordaid and technically supported by the Dutch agency Equator Foundation. Approval was given by regional and national authorities in Rwanda. Wide support on community level was gained through public acclamation by the ECR (Richters et al, 2008). Sociotherapy is a therapeutic group intervention aiming at social bonding and mental health recovery (Scholte et al, 2011b). The programme was open to any adult (≥16 years old) wanting to participate. Groups contained ten to twenty participants and were mostly mixed: both sexes, various ethnic backgrounds, wide age distribution. Forty-five groups ran simultaneously, having weekly meetings over a period of fifteen weeks, lasting three hours each. Group leaders were local people, familiar with the region’s history and current living situation; they had received a three months’ training from Equator staff and were regularly supervised. They were allowed to attune the working methods to the characteristics of their groups (e.g., degree of trust, nature of problems) and to their own affinity and experience, putting different emphases on elements like rules, role plays, and spirituality.

Instruments

Mental health

To measure mental health we used the Self Reporting Questionnaire (SRQ-20), an instrument developed by the World Health Organization (WHO) for screening for common mental disorders in primary health care settings. It consists of twenty yes/no questions about mood, thinking capacity, feelings of anxiety and physical well-being. ‘Yes’ answers result in a higher score, meaning a poorer mental health condition. Cut-off points vary considerably depending on setting and culture. A cut-off point of 7/8 is
widely used (Harpham et al, 2003). We (back-) translated the SRQ-20 to the local language, Kinyarwanda, and validated it for the actual context (Verduin et al, 2010). The capacity of the SRQ-20 to identify probable psychopathology proved to be sufficient for men (AUC=0.74) and women (AUC=0.76). Reliability was considered to be good (Cronbach’s $\alpha$=0.83). The optimal cut-off point was 7/8 for men and 9/10 for women. We also validated the SRQ-20 for its capacity to assess change in symptom severity over time. The instruments factor structure proved to be time invariant; the number of factors, factor loadings and covariances of factors remained equal over time (Scholte et al, 2011b).

**Social capital**

There is a large variety in the elements of social capital studied in the various research projects published, depending on which distinction or element of social capital is considered most important. We chose to make use of the short version of the Adapted Social Capital Assessment Tool, (Short A-SCAT; Tuan et al, 2005), because of its proven validity in various contexts, its limited length and the presumed relevance of its items for the Byumba context. Items of the Short A-SCAT address received support from groups or individuals, whether and how people connect with leaders, how they feel connected to others in their living area and how they get along.

The Short A-SCAT has been extensively validated in two resource-poor settings (Vietnam, Peru). Due to time and financial constraints, we could not validate our Rwandan version in the same scrupulous way. However, before we used the Short A-SCAT, it was discussed in focus groups, tested and discussed with our interviewers. There was overall agreement on the changes to be made in the phrasing of items in order to capture the intended meaning in an easy to understand way for local respondents. For example: the word ‘community’ was changed to ‘area, neighbourhood or hill’; the word ‘majority’ was changed to ‘many people’, as the term had been contaminated during ethnic polarisation; in the question ‘are you an active member of any group?’ the word ‘active’ was discarded because it appeared to be too ambiguous and would probably bias responders towards answering ‘yes’.

After a pilot study, we added some new items in order to raise the instrument’s psychometric qualities, providing more response options for giving and receiving support and for manifestations of civic participation. Also, Likert scales were used instead of yes/no options, which allowed for a more differentiated response (see Annex) (Verduin et al, 2010).

**Participants**

**Experimental group**

Out of forty-five sociotherapy groups simultaneously starting sessions, ten groups which in total contained an equal number of men and women, were selected in rural as well as urban areas. We then formed our experimental study group by randomly selecting 100 out of the total of 133 participants of these ten groups.
**Control group**

We applied the following procedure to compose a control group that was equivalent at baseline with regard to our main outcome measure, the SRQ-20 score. During our pilot study, 2.5 times more respondents in the experimental group had baseline scores above cut-off than in the control group (Scholte et al, 2011a). For this study we therefore aimed to interview 2.5 times (n=250) more respondents than in the experimental group, to later select 100 out of these to compose a control group. We identified regions within Byumba district where the programme was not or had not been running so far, or for practical reasons would not start over the upcoming eight months. Here, we selected respondents through convenience sampling; 251 respondents were interviewed. After analysis of the data collected, we selected a group of 100 out of these for which the distribution of SRQ-20 scores matched that of the intervention group. For this purpose we used eight clusters of scores (0-1, 2-3, 4-5, 6-7, 8-9, 10-12, 13-15, 16-20) and from each cluster randomly selected a number of respondents equal to the corresponding cluster in the experimental group. This final selection of 100 constituted our definite control group.

**Interviews**

Eight local interviewers were recruited; all were sociology students at the ‘Institut Polytechnique de Byumba’ in Byumba. Their one-week training addressed the principles of a longitudinal study design, interviewing techniques and our measuring instrument (Verduin et al, 2010; Scholte et al, 2011a). Informed consent was obtained from respondents by use of an explanatory text, which because of the high illiteracy rate was read aloud. In case of refusal, demographic data and reasons for refusal would be requested and documented, but no-one refused.

**Statistical analysis**

All psychometric and validation analyses were performed using SPSS 18. AMOS was used to conduct latent growth modelling.

Before descriptive analysis (means, SD, t-tests, chi square tests, correlations), data were screened for normality in distribution; skewness and kurtosis values were between -2 and 2. Missing values were handled using full information maximum likelihood (FIML) estimation (N=200 for all analyses). It has been shown that under ignorable missing data conditions, FIML estimates are unbiased (Enders & Bandalos, 2001).

**Factor analysis**

Factor analysis was performed to distinguish which elements of social capital were measured by the Short A-SCAT in our Rwandan context. Principal component analysis was done to derive independent subscales. A scree plot and eigen values over 1 were considered to determine the optimum number of factors representing the different domains of social capital.
**Descriptive analyses**
We used descriptive analyses (means, SD, correlations) to evaluate possible changes over time in elements of social capital.

**Latent growth modeling**
We applied latent growth models to variables that showed possible changes over time. LGM models can be extended to include structural parameters as predictors (Duncan et al, 2006). Thus, we examined the relationship between predictor variables (i.e., socio-therapy), baseline level, and linear change in each variable separately. We then examined the association of components of social capital and mental health over time using associative LGMs. Associative LGMs allow researchers to examine the correlations among development parameters for pairs of behaviors. We added sociotherapy as a predictor variable to the associative LGM to examine the effects of sociotherapy on mental health and civic participation simultaneously. We evaluated model fit using the discrepancy $\chi^2$, comparative fit index (CFI), non-normed fit index (NNFI / TLI), root-mean-square error of approximation (RMSEA), and Akaike information criterion (AIC). Models that fit very well [adequately] are indicated by CFIs and NNFIs $\geq .95$[≥ .90] and RMSEAs $\leq .06$ [≤ .08] (Hu & Bentler, 1999).

**RESULTS**

**Baseline characteristics**
The two study groups matched on SRQ-20 score distribution, sex and age at baseline (see Table 1). We compared study participants who completed all three assessments with those who dropped out after the first or second assessment on all variables assessed at T0.

Drop out did not differ significantly between the experimental and the control group ($p=0.79$). Drop-outs at T1 or T2 from either study group did not differ significantly in sex, age or level of education. Neither was there a difference in sex, age, level of education, SRQ-20 scores and scores on Short A-SCAT between actual respondents and drop-outs at T1 and T2. We concluded that there were no indications of meaningful nonresponse bias.

**Reliability and factor analysis of the Short A-SCAT**
Our adapted version of the Short A-SCAT had reasonable psychometric qualities. Using the total sample at baseline and after reversing question 19, Cronbach’s alpha was 0.75 for the instrument as a whole; it did not improve if any item was deleted. Earlier factor analyses of the Short A-SCAT in Peru and Vietnam (by de Silva and colleagues) yielded three factors: cognitive social capital, group membership/(social) support and citizenship (Harpham, 2002; Tuan et al, 2005; de Silva et al, 2005).

From principal component analysis item 1 was omitted because it had a different response format (yes/no question) and therefore did not load on one factor specifically.
Our version of the Short A-SCAT fell apart into similar components as described above:
– Cognitive social capital (items 11 and 14, 15, 16, 17, 18, 19; Cronbach’s alpha = 0.86);
– Support (items 2, 3, 4, 5, 6, 7, 8; Cronbach’s alpha = 0.68);
– Civic participation: items 9, 10, 12, 13. Cronbach’s alpha = 0.63).
These three factors accounted for 44.8% of the total variance. The items can be catego-
rized in three sections; cognitive social capital and two elements of structural social
capital: support manifestations and civic participation. The term support represents dis-
tinct manifestations of received support; help from groups or individuals in comforting/
encouraging in good or bad situations, in improving one’s economic situation and in
knowing and doing things (see Annex). We prefer the term civic participation over citi-
zenship (De Silva et al, 2005), as it entails an active attitude towards one’s community.
The items in our scale of civic participation address joining elections and actively dis-
cussing and solving problems with local leaders or in groups, respectively (see Annex).

Descriptive analyses of mental health and social capital
Table 2 shows mean scores, standard deviations, and bivariate correlations of the three
measurements of mental health (SRQ-20 scores), cognitive social capital, support and
civic participation, for both the experimental and the control group. Mean scores did not
appear to change consistently over time, except mental health and civic participation in
the experimental group.

LGM results
Table 3 shows model fit indices of subsequent LGMs. Each individual model showed a
good fit. Results of the final associative LGM of mental health and civic participation
with sociotherapy group membership as a predictor variable are reported in Figure 1 and
Table 4. The results showed a significant effect of sociotherapy on both linear change
in mental health and civic participation. In addition, civic participation at baseline was
lower in the sociotherapy group than in the control group. Although mental health and
civic participation were correlated at baseline, linear changes in mental health and civic
participation over time were not significantly correlated.

DISCUSSION

This study aimed to establish the effects of a sociotherapy program in Rwanda on both
mental health and social capital, and whether these effects were correlated. We measured
three elements of social capital: cognitive social capital, support, and civic participation.
We found a positive effect of the intervention on mental health and civic participation;
support and cognitive social capital did not change over time. No correlation was found
between over time changes in mental health and civic participation.
Civic participation refers to an active attitude towards one’s community, and to particip-
ating in collective actions within that community. The concept is easily linked to that
of collective efficacy, which Sampson and colleagues (1997) defined as ‘social cohesion
among neighbors combined with their willingness to intervene on behalf of the common good’. They added that whereas social capital embodies the resource potential of social networks, it should not be overlooked that the process of activating or converting social ties to achieve desired outcomes is particularly salutary. Collective efficacy refers to a community’s capacity to deal adequately with environmental demands and to achieve goals through its social organization that cannot be achieved by individuals alone. De Silva and colleagues (2007) hypothesised that through collective actions community members can increase control over their lives and environment, and that this increased control over post-disaster demands may in turn mitigate individual mental health problems. Wind and colleagues (2011, 2012) found that high social capital may foster collective efficacy and decrease the employment of coping strategies and social support by individuals, and that social capital exerts its effect on mental health outcomes via collective efficacy. In our study a positive effect of the intervention was found on both mental health and civic participation, a concept akin to collective efficacy. We could not show a correlation between these effects, which was contrary to what might be expected considering the findings of Wind and colleagues. This may be because our analyses did not include respondents’ individual appraisal of current and past experiences or their coping behavior, both of which may mediate the association between social capital and mental health (Wind et al, 2011).

The intervention may also just have raised civic participation without affecting the other elements of social capital we measured: cognitive social capital and support. In their study on the promotion of social capital in Nicaragua, Brune and Bossert (2009) already pointed to indications that in non-western cultures cognitive and structural components may be disconnected. In the highly complex sociocultural setting of post-genocide Rwanda, elements of cognitive social capital like trust, sense of belonging and solidarity are not easily discussed openly. Therefore, items of our questionnaire addressing such sensitive issues may not have elicited valid responses. Especially men tend not to trust others easily and to keep problems inside. Qualitative information consistently pointed out that men in Rwanda generally do not share and seek support for emotional problems (Richters et al, 2005; Richters et al, 2008a; Richters, 2010; Verduin et al, 2010).

In turn, lack of trust may impact mutual support. The use of credit in exchanges was common in preconflict Rwanda (Colleta & Cullen, 2000). This practice has diminished over time, in part due to decreased levels of trust as a consequence of war, but also because of increasing poverty and the value placed on money and individualism. In general, people have become more reluctant to give gifts, for they are less confident that these acts will be reciprocated. This should be taken into consideration when addressing the issue of support in countries as poor as Rwanda (Verduin et al, 2010). In our study, scores on items of the Short A-SCAT addressing support were not consistent, and no change over time was established. This may be due to insufficient validity of the items concerned. A systematic cognitive validation of the instrument’s version used in this study, performed in accordance with a method described by De Silva and colleagues (2006), revealed that responders did not seem to differentiate between the various kinds of support mentioned in the respective items: comforting, encouraging, or economic support (Verduin et al, 2010). In this very poor region, all support seemed to be expressed in material forms. If no goods were received or given, no comfort or encouragement was
experienced or provided. De Silva and colleagues (2006) describe similar misunderstandings in respondents’ interpretation of items addressing support when using the A-SCAT in Peru and Vietnam.

This study has some potential limitations. First, a larger sample might have increased the validity of the multilevel models. Second, investigating individual factors like appraisal and coping behavior and including these in our analyses might have led to a clearer understanding of the relation between mental health and social capital. Finally, the use of categories to record answers may mask nuances in definitions and understanding of complex concepts. Even though qualitative research and extensive validation of the Short A-SCAT was performed in various countries, and despite our adaptation of the instrument to the local context, responders may not have interpreted all items in their intended meaning.

Further research is required to confirm the sensitivity of the Short A-SCAT as a measure of social capital in complex sociocultural settings like Rwanda. In particular, the validity of items addressing structural social capital and support needs attention (Verduin, 2010). Future studies also need tot determine which specific elements of social capital can intentionally be promoted in different settings, and what is the nature of possible links with mental health.

CONCLUSION

This study suggests that indeed it is possible to promote social capital through a community intervention. The same intervention was shown to improve mental health. Although no indication was found that both outcomes were related, earlier studies indicate that links between social capital and mental health may exist. Whether or not this is the case, from our work it may be concluded that community interventions aiming to raise the level of social capital may also positively impact mental health, and therefore be most appropriate to implement in post-conflict situations.

The intervention studied here impacted one element of social capital in particular: civic participation. If social capital and mental health would solely be linked through civic participation, the latter might serve as the specific target of choice for future interventions. Such a possible one-off relation, however, has to be established by further research. As yet, it may be appropriate in any post-conflict setting to identify the elements of social capital which correlate with mental health, and subsequently target community interventions particularly at these elements.
Annex: Short A-SCAT, readapted version for Rwanda
Scholte & Verduin (2007), adapted from Tuan, Harpham et al. (2005)

1 Are you a member of any group?
   1. Yes   2. No

2 In the last 12 months did you receive from the group(s) any help in comforting/encouraging you?
   1. No   2. Yes, once   3. Yes, a few times   4. Yes, often

3 In the last 12 months did you receive from the group(s) any help in improving your economic situation?
   1. No   2. Yes, once   3. Yes, a few times   4. Yes, often

4 In the last 12 months did you receive from the group(s) any help in knowing and doing things?
   1. No   2. Yes, once;  3. Yes, a few times   4. Yes, often

The following questions have nothing to do with any group.

5a In the last 12 months did you receive any help or support from any one, in the sense of comforting when something bad happened? (e.g.: losing a loved one)
   1. No   2. Yes, once   3. Yes, a few times   4. Yes, often

   If no, go to question 6a.

5b If yes, from whom? You can tick more than one option.
   O Family members
   O Neighbours
   O Friends
   O Religious people
   O Leaders
   O Others

6a In the last 12 months did you receive any help or support from any one, in the sense of encouraging when something good happened? (e.g.: a wedding)
   1. No   2. Yes, once   3. Yes, a few times   4. Yes, often

   If no, go to question 7a.

6b If yes, from whom? You can tick more than one option.
   O Family members
   O Neighbours
   O Friends
   O Religious people
   O Leaders
   O Others
7a. In the last 12 months did you receive any help or support from any one, in the sense of improving your economic situation?
   1. No  2. Yes, once  3. Yes, a few times  4. Yes, often

   If no, go to question 8a.

7b. If yes, from whom?
   ○ You can tick more than one option.
   ○ Family members
   ○ Neighbours
   ○ Friends
   ○ Religious people
   ○ Leaders
   ○ Others

8a. In the last 12 months did you receive any help or support from any one, in the sense of any help in knowing and doing things?
   1. No  2. Yes, once  3. Yes, a few times  4. Yes, often

   If no, go to question 9.

8b. If yes, from whom?
   ○ You can tick more than one option.
   ○ Family members
   ○ Neighbours
   ○ Friends
   ○ Religious people
   ○ Leaders
   ○ Others

9. In the last 12 months have you joined together with other people of your area/neighbourhood to address a common problem/issue?
   1. No  2. Yes, once  3. Yes, a few times  4. Yes, often

10. In the last 12 months have you talked with or informed leaders about problems in this area/neighbourhood you live in?
    1. No  2. Yes, once  3. Yes, a few times  4. Yes, often

11. In general, are many people in this area/neighbourhood satisfied with local leaders?

12. In the last 12 months have you joined others in choosing your local leaders?
13 In general do you join others in attending meetings called by local leaders?

14 In general, can many people in this area/neighbourhood be trusted?

15 In general, do many people in this area/neighbourhood get along with each other?

16 Do you really feel part of this area/neighbourhood?

17 In general, do you feel safe in this area?
   1. Not at all  2. A little;  3. Most of the time;  4. Completely

18 In your area/neighbourhood do people have a culture of visiting each other?
   1. Not at all/ no one  2. Only few people  3. Most of the people;  4. Everyone/All

19 Do you think that many people in your area/neighbourhood would try to take advantage of you if they got the chance?
   1. No one  2. Only few people  3. Many people;  4. Everyone
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### Table 1  Socio-demographic characteristics of experimental and control group at baseline

<table>
<thead>
<tr>
<th></th>
<th>Experimental group</th>
<th>Control group</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=100</td>
<td>n=100</td>
<td>Indep. T-tests/ Chi²</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45 (45%)</td>
<td>47 (47%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Female</td>
<td>55 (55%)</td>
<td>53 (53%)</td>
<td></td>
</tr>
<tr>
<td>Mean age (min-max)</td>
<td>34.9 (16-76)</td>
<td>38.5 (16-73)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>Sd 15.8</td>
<td>Sd 14.1</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
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<tr>
<td>Nil</td>
<td>48 (48%)</td>
<td>54 (54%)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Primary</td>
<td>42 (42%)</td>
<td>34 (34%)</td>
<td></td>
</tr>
<tr>
<td>Secondary 1-3</td>
<td>9 (9%)</td>
<td>9 (9%)</td>
<td></td>
</tr>
<tr>
<td>Secondary 4-7</td>
<td>1 (1%)</td>
<td>3 (3%)</td>
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<tr>
<td>SES</td>
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<td></td>
</tr>
<tr>
<td>Marginal</td>
<td>6 (6%)</td>
<td>13 (13%)</td>
<td>χ²(2) = 0.022</td>
</tr>
<tr>
<td>Poor</td>
<td>83 (83%)</td>
<td>66 (66%)</td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>11 (11%)</td>
<td>21 (21%)</td>
<td></td>
</tr>
<tr>
<td>Mean SRQ-20 score</td>
<td>8.41</td>
<td>8.26</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sd</td>
<td>5.05</td>
<td>4.83</td>
<td></td>
</tr>
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</table>
Table 2  Descriptive analyses of mental health and three elements of social capital $^{a,b}$

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mental Health T0</td>
<td>0.67 ***</td>
<td>0.64 ***</td>
<td>-0.16</td>
<td>-0.19</td>
<td>-0.06</td>
<td>-0.06</td>
<td>0.08 **</td>
<td>-0.05 **</td>
<td>-0.18</td>
<td>-0.35 **</td>
<td>-0.14</td>
<td>8.26</td>
<td>(4.84)</td>
<td></td>
</tr>
<tr>
<td>2 Mental Health T1</td>
<td>0.61 ***</td>
<td>0.73 ***</td>
<td>-0.25 *</td>
<td>-0.25 *</td>
<td>-0.07</td>
<td>-0.05</td>
<td>0.13</td>
<td>-0.13</td>
<td>-0.10</td>
<td>-0.30 **</td>
<td>-0.37 **</td>
<td>8.15</td>
<td>(5.69)</td>
<td></td>
</tr>
<tr>
<td>3 Mental Health T2</td>
<td>0.66 ***</td>
<td>0.47 ***</td>
<td>-0.34 **</td>
<td>-0.34 **</td>
<td>-0.25 *</td>
<td>-0.12</td>
<td>0.03</td>
<td>-0.08</td>
<td>-0.13</td>
<td>-0.40 **</td>
<td>-0.38 **</td>
<td>7.27</td>
<td>(4.86)</td>
<td></td>
</tr>
<tr>
<td>4 Cognitive T0</td>
<td>-0.20 *</td>
<td>-0.01</td>
<td>-0.16</td>
<td>0.41 ***</td>
<td>0.36 **</td>
<td>0.08</td>
<td>0.02</td>
<td>-0.05</td>
<td>0.15</td>
<td>0.13</td>
<td>0.25 *</td>
<td>13.61</td>
<td>(4.03)</td>
<td></td>
</tr>
<tr>
<td>5 Cognitive T1</td>
<td>-0.14</td>
<td>-0.06</td>
<td>-0.14</td>
<td>0.36 **</td>
<td>0.32 *</td>
<td>0.29 **</td>
<td>0.14</td>
<td>0.12</td>
<td>0.18</td>
<td>0.34 **</td>
<td>0.25 *</td>
<td>13.09</td>
<td>(4.13)</td>
<td></td>
</tr>
<tr>
<td>6 Cognitive T2</td>
<td>-0.15</td>
<td>-0.03</td>
<td>-0.27 *</td>
<td>0.33 **</td>
<td>0.24 *</td>
<td>0.15</td>
<td>0.06</td>
<td>-0.14</td>
<td>0.21</td>
<td>-0.04</td>
<td>0.32 **</td>
<td>14.71</td>
<td>(4.25)</td>
<td></td>
</tr>
<tr>
<td>7 Support T0</td>
<td>-0.16</td>
<td>-0.08</td>
<td>-0.11</td>
<td>-0.04</td>
<td>0.01</td>
<td>0.01</td>
<td>0.15</td>
<td>0.09</td>
<td>0.30 **</td>
<td>0.22 *</td>
<td>0.00</td>
<td>3.09</td>
<td>(3.48)</td>
<td></td>
</tr>
<tr>
<td>8 Support T1</td>
<td>-0.16</td>
<td>-0.06</td>
<td>-0.20</td>
<td>0.06</td>
<td>-0.14</td>
<td>0.17</td>
<td>0.23 *</td>
<td>0.13</td>
<td>0.19</td>
<td>0.12</td>
<td>0.17</td>
<td>3.47</td>
<td>(4.03)</td>
<td></td>
</tr>
<tr>
<td>9 Support T2</td>
<td>-0.13</td>
<td>-0.02</td>
<td>-0.21</td>
<td>0.15</td>
<td>0.16</td>
<td>-0.09</td>
<td>0.01</td>
<td>-0.01</td>
<td>-0.08</td>
<td>0.19</td>
<td>0.11</td>
<td>4.26</td>
<td>(4.29)</td>
<td></td>
</tr>
<tr>
<td>10 Civic Participation T0</td>
<td>-0.07</td>
<td>0.01</td>
<td>-0.16</td>
<td>0.25 *</td>
<td>0.22 *</td>
<td>0.19</td>
<td>0.08</td>
<td>0.05</td>
<td>0.16</td>
<td>0.31 **</td>
<td>0.37 **</td>
<td>7.74</td>
<td>(2.37)</td>
<td></td>
</tr>
<tr>
<td>11 Civic Participation T1</td>
<td>-0.29 **</td>
<td>-0.11</td>
<td>-0.24 *</td>
<td>0.15</td>
<td>0.40 ***</td>
<td>0.19</td>
<td>0.31 **</td>
<td>0.14</td>
<td>0.12</td>
<td>0.49 ***</td>
<td>0.30 *</td>
<td>7.67</td>
<td>(2.76)</td>
<td></td>
</tr>
<tr>
<td>12 Civic Participation T2</td>
<td>-0.19</td>
<td>-0.08</td>
<td>-0.07</td>
<td>0.07</td>
<td>0.09</td>
<td>0.01</td>
<td>0.11</td>
<td>0.08</td>
<td>0.05</td>
<td>0.36 **</td>
<td>0.47 ***</td>
<td>8.03</td>
<td>(2.39)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>8.41</td>
<td>7.28</td>
<td>6.31</td>
<td>12.55</td>
<td>12.33</td>
<td>13.80</td>
<td>3.05</td>
<td>3.86</td>
<td>4.05</td>
<td>6.59</td>
<td>7.12</td>
<td>7.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>(5.05)</td>
<td>(4.64)</td>
<td>(3.91)</td>
<td>(4.35)</td>
<td>(4.45)</td>
<td>(4.08)</td>
<td>(3.02)</td>
<td>(4.10)</td>
<td>(4.02)</td>
<td>(2.99)</td>
<td>(2.96)</td>
<td>(1.82)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*  p<.05, **  p<.01, ***  p<.001

$^a$ Sociotherapy group: below diagonal; control group: above diagonal.

$^b$ Numbers represent correlations unless otherwise indicated.
Table 3  Model Fit Indices

| Table 3 Model Fit Indices |
|-------------------------|-----------------|-------------|-------------|-------------|-------------|-------------|
|                         | df  | $\chi^2$ | p  | RMSEA | CFI | NNFI | AIC |
| Model 1 Civic Participation LGM | 1   | 0.03     | .859 | 0.00  | 1.00 | 1.10 | 16.03 |
| Model 2 Civic Participation LGM with predictor | 2   | 0.39     | .824 | 0.00  | 1.00 | 1.13 | 24.39 |
| Model 3 Mental Health LGM     | 1   | 0.14     | .711 | 0.00  | 1.00 | 1.03 | 16.14 |
| Model 4 Mental Health LGM with predictor | 2   | 0.61     | .736 | 0.00  | 1.00 | 1.04 | 24.61 |
| Model 5 Mental Health Civic Participation Associative LGM | 8   | 14.79    | .063 | 0.07  | 0.97 | 0.93 | 52.79 |
| Model 6 Mental Health Civic Participation Associative LGM with predictor | 9   | 14.51    | .105 | 0.06  | 0.98 | 0.94 | 66.51 |

Table 4  Mental Health and Civic Participation: Effects of Sociotherapy

<table>
<thead>
<tr>
<th>Table 4 Mental Health and Civic Participation: Effects of Sociotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociotherapy group</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mental Health</td>
</tr>
<tr>
<td>Baseline Level</td>
</tr>
<tr>
<td>Linear Change a</td>
</tr>
<tr>
<td>Civic Participation</td>
</tr>
<tr>
<td>Baseline Level</td>
</tr>
<tr>
<td>Linear Change a</td>
</tr>
</tbody>
</table>

*** p<.001

a Linear change estimates are per month.
Figure 1  Associative LGM involving Sociotherapy As A Predictor of Change

For the model: $\chi^2(9)=14.51$, p = .105, RMSEA = .06, CFI = .98, NNFI = .94, AIC = 66.51.

Observed variables are shown as rectangles, factors as ovals. Covariances are shown as dotted lines with correlations.
Paths are shown as arrows with standardized regression coefficients or fixed regression weights (without decimal places).
Endogenous variables are shown with $R^2$, * p < .05, ** p < .01