The relevance of social capital and sense of coherence for mental health of refugees

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ARTICLE INFO

ABSTRACT

Introduction: Migration puts refugees in a completely new social context when simultaneously some have to deal with previously experienced traumatic events and post-migration stressors. Social capital and sense of coherence could be key resources to improve mental health of refugees. This study aims to examine the interplay between social capital (structural and cognitive), sense of coherence and mental health of refugees in the Netherlands.
Objective: The present study was conducted to i) examine if social capital (structural and cognitive) and mental health are related in a population of Dutch refugees, and ii) test if sense of coherence has a moderating and/or a mediating effect on this relation.
Method: Data were collected through questionnaires (n = 154) in a cross-sectional survey at different locations throughout the Netherlands. The data were analysed with multiple regression analyses and nonparametric bootstrapping using SPSS.
Results: Social capital (structural and cognitive) was positively related to mental health. In addition a positive relation between sense of coherence and mental health of refugees was found. The relationship between cognitive social capital and mental health was completely mediated by sense of coherence. No moderation effect of sense of coherence on the relation between social capital and mental health was found.
Conclusions: The current study contributed to understanding the social mechanism that determines refugee mental health: participating in social groups (structural social capital) and having supportive and trusting relationships (cognitive social capital), whilst experiencing life as comprehensible, manageable, and meaningful (sense of coherence) are positively related to better mental health of refugees. Findings indicate that preventive interventions aiming to enhance refugees' mental health may be more effective when targeting and promoting both social capital and sense of coherence, from a relatively early stage after arrival in the Netherlands.

1. Introduction

By definition a refugee is someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion (UNHCR, 1951). A refugee often suffers from an accumulation of traumatic and stressful events and losses, because of war, imprisonment, sexual violence, natural disaster or prolonged discrimination (Silove et al., 2017). After flight and arrival in a new country refugees face new stressful and adversary events, such as lengthy asylum procedures, insecure residency status, restricted access to services, work or study, discrimination, and loss of socio-economic status (Gleeson et al., 2020; Groen et al., 2019;

Hvidtfeldt et al., 2020).

In 2018 the World Health Organization (WHO) showed that these experiences during all phases of the displacement, migratory and resettlement process, are risk factors for mental health problems. According to a recent overview by the Netherlands Institute for Social Research (2019) prevalence of psychiatric illnesses is higher amongst refugee populations in comparison to native populations. According to the most recent review of Patanè et al. (2022) the estimated pooled prevalence rates for refugees were 32% for major depressive disorder and 31% for post-traumatic stress disorder (PTSD), based on data from both low and high income countries and from different cultural groups. These findings also show that a substantial amount of refugees show remarkable resilience and overcome hardship and traumatic events.

This raises the question which individual and social factors protect against the development of mental health problems. Scholars and clinicians increasingly focus on the interplay between individual and social factors that promote the mental health of refugees (Bäärnhielm, 2016; Hoge et al., 2007). Both social capital as well as sense of coherence may be of great importance to better understand these differences.

1.1. Social capital

One factor that is found to be important for differences in mental health after traumatic events is social capital (Verduin et al., 2014; Wind et al., 2011). In a systematic review of systematic reviews Ehsan et al. (2019) show that social capital predicts better mental and physical health.

Despite its broad dissemination throughout the social sciences and the seminal work of Coleman (1990) and Putnam (1993), there is no single universally accepted definition of social capital (Kawachi et al., 2013). The 'social cohesion' approach conceptualises social capital as the resources (e.g., trust, norms, and the exercise of sanctions) available to members of social groups. The 'social network' approach conceptualises social capital in terms of resources (i.e. social support, information channels, social credentials) that are embedded within an individual's social network (Kawachi, 2006). More recent debates about the conceptualization of social capital focus on social capital having individual versus collective properties. Furthermore, a distinction between bonding and bridging social capital is made. Bonding social capital highlights the connections within a community of people sharing similar characteristics or backgrounds, including interests, attitudes and demographics (Claridge, 2018). Bridging social capital may emerge from the connection people build to share their resources (Almedon, 2005a; Murray et al., 2020).

The current study follows Harpham et al. (2002) in understanding social capital to refer to the degree of connectedness and the quantity and quality of social relations in a given population. Harpham et al. (2002) follow a model of social capital that disaggregates the resource into two components: structural and cognitive (Krishna & Shrader, 2000). Structural social capital refers to the extent and intensity of community linkages; and cognitive social capital refers to the appreciation of these community linkages in terms of trust, mutual help and reciprocity (Wind & Komproe, 2018).

As a result of forced migration refugees are distanced from family members, friends and other community linkages. Increasing social capital has been identified as a key resource to give an increased control over post-migration demands. Furthermore, social capital and social cohesion have been found to be associated with the health and emotional well-being of refugees (Habib et al., 2020). This may in turn alleviate refugees' mental health problems, or at least not increase the risk of developing psychiatric disorders (De Silva et al., 2007; Hvidtfeldt et al., 2020; LeMaster et al., 2018).

1.2. Sense of coherence

A second important and related social factor for mental health is 'sense of coherence'. Sense of coherence is defined by Antonovsky (1993) as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (i) the stimuli deriving from one's internal and external environments in the course of life are structured, predictable and explicable; (ii) the resources are available to meet the demands posed by these stimuli; and (iii) these demands are challenges, worthy of investment and engagement. The construct consists of three components: comprehensibility, manageability and meaningfulness. Sense of coherence is an umbrella term that entails the idea that somebody has well-functioning social networks, is in touch with one's inner life, has an everyday life that is meaningful, and has clear "coordinates" in life (such as having an existential position) (Mittelmark et al., 2017).

Antonovsky (1987) assumed that people with a high sense of coherence would be in better general health and would experience greater well-being and less stress than people with a low sense of coherence. Many empirical studies have supported this hypothesis (Eriksson & Lindström, 2006; Mittelmark et al., 2017). It protects against anxiety, anger, depression, post-traumatic stress disorder, perceived stressors, burnout and hopelessness and is strongly and positively related to health resources such as optimism, hardiness, self-esteem, self-efficacy, acceptance of disability and social skills as well as predicts good health and quality of life from childhood to adulthood (Del-Pino-Casado et al., 2019; Eriksson & Lindström, 2006).

In the ever changing and unsafe environment of a refugee, situations are often unstructured, unpredictable and difficult to explain, and resources may be under pressure and in constant transition. In Antonovsky's (1987) terms, life has become more incomprehensible, unmanageable and meaningless, leaving refugees more vulnerable for development of mental health complaints and poor functioning (Carstens & Spangenberg, 1997; Lundberg & Peck, 1994). Accordingly, understanding the impact sense of coherence has on the relation between social capital and mental health is particularly relevant in the context of refugees.

1.3. The interplay of social capital and sense of coherence

An ever-increasing number of studies, including cross-cultural and international applications, focus on how social capital and sense of coherence are associated with mental health factors (Kimura & Yamazaki, 2016; Larm et al., 2016; Mato & Tsukasaki, 2019). This study set out to empirically explore the interplay between social capital and mental health among refugees, as understanding this social mechanism may inform policy makers and clinicians to prevent and treat refugee mental health problems.

Social capital, sense of coherence and mental health are significantly correlated with each other (Kimura & Yamazaki, 2016; Maass et al., 2014), but there are contradictory outcomes in regard to relations between social capital dimensions and sense of coherence (Larm et al., 2016; Mato & Tsukasaki, 2019). Wind and Komproe (2012) showed that structural social capital provides the resources that are necessary for collective action (Sampson et al., 1997), and cognitive social capital creates the right ambiance to engage in collective action (Eriksson, 2011). Through collective actions, community members can increase understanding and control (sense of coherence) over their lives and environment. Social capital (sense of community and social trust) may help to control the manageability of stress (sense of coherence) because a person knows they have a reliable source to overcome stress (Maulana et al., 2021). Antonovsky postulated that people with a strong sense of coherence successfully and consistently utilize the various general resources that are accessible (Mittelmark et al., 2017). By taking advantage of various resources and options, people with a strong sense of coherence may be more likely to deal with problems in a flexible and realistic manner, and may be better at coping with stress and receiving support from others (Mato & Tsukasaki, 2019). Thus, a person's sense of coherence presumably buffers the impact of stressful life events (Richardson & Ratner, 2005). Our study postulates that sense of coherence has a moderating effect on the relation between social capital (structural and cognitive) and mental health. For refugees, an increased control over post-migration demands may in turn mitigate refugees' mental health problems, suggesting a relation between social capital (structural and cognitive) and mental health, through sense of coherence (mediation effect).

Few studies have tested both the moderating and mediating role of sense of coherence. Ying et al. (2007) found that sense of coherence may be best considered both a moderator and a mediator of life stress and mental health. Gana (2001) finds a moderating and mediating effect of sense of coherence on the relation between adverse experiences and positive well-being. However, more research is needed to examine

whether sense of coherence, moderates, mediates, or moderates and mediates the impact of social capital on mental health in a refugee population. Hence, this study examines whether sense of coherence has a moderating and/or a mediating effect on the relation between social capital and mental health in a non-patient and non-clinical population of refugees in the Netherlands.

2. Method

2.1. Procedure

We conducted a cross-sectional survey in the Netherlands. A convenience sample of refugees was collected. Data collection was done in close collaboration with and through the networks of three organisations operating on the Dutch national level to promote (mental) health and societal participation of refugees, i.e. Vluchtelingenwerk Nederland (VW-NL), Pharos and ARQ Centrum'45.

The ethical approval for the study was obtained from the Board of the Faculty of Social and Behavioural Sciences of Utrecht University (October 1, 2019, description 19–087). An addendum was approved by the same committee in April 2020 after needing modification due to the Covid-19 outbreak and national lockdown procedures following Dutch national guidelines.

Five research students were trained in the administration of the questionnaires, on how to support participants and on referral when needed. All research students spoke Dutch and English fluently. One research student spoke Arabic as a native language.

Contact information of employees and key persons from the refugee community from VW-NL, Pharos and ARQ Centrum'45 were obtained after a person showed interest in the study. From the networks of these employees and key persons possible participants who met inclusion criteria were contacted. Participants who were included in the study were 18 years of age or older, resided between six months and five years in the Netherlands and had sufficient understanding of the Dutch, English or Arabic language to fill out the questionnaires. The research students assembled groups of four to six participants in relatively quiet and nearby locations in which some level of privacy and Covid-19 guidelines of the Dutch National Institute for Public Health and the Environment (2020) could be maintained (e.g. public library, classroom, meeting room in a church).

During these group meetings the research student started by giving the participant information and collecting written informed consent in Dutch, English or Arabic, depending on the preferred language of the participant. The questionnaires were filled out, whilst the research student monitored the privacy and clarified questions whenever necessary. Even though payment of research subjects can be a source of bias, participants were given a small financial compensation to increase motivation to accurately fill in the questionnaires. Data were anonymized and stored at a computerised database (Questmanager of Philips VitalHealth).

During the lockdown period due to the Covid-19 outbreak assessments in group sessions were not possible. Instead, 23 participants were assessed individually, after informed consent, through phone or video call, maintaining privacy regulations.

A total of 154 participants were included in the study from January till December 2020. Three participants withdrew their consent (2.0%). Reasons for withdrawal of consent were respectively (i) suspicion against the researchers, (ii) fear of eviction and (iii) loss of signed informed consent by the research student and inability to contact this participant.

Translations into Arabic of the questionnaires that were not available in that language, were translated and back-translated by an official translation agency, following guidelines by the International Test Commission (2017).

2.2. Measurement of variables

2.2.1. Social capital

The Short Version of the Adapted Social Capital Assessment Tool (SA-SCAT) by De Silva et al. (2006) was used to assess social capital. The SA-SCAT is a shortened version of the Adapted Social Capital Assessment Tool (A-SCAT) and consists of nine questions. We selected the SA-SCAT for our study for its limited length, its wide international use, its adequate psychometric properties in various contexts, and its distinction between structural and cognitive social capital (Andreoli et al., 2009; Verduin et al., 2014; Wind et al., 2011). The SA-SCAT is extensively validated within different settings (De Silva et al., 2006; Tuan et al., 2005).

Structural social capital includes three aspects: *group membership, social support* and *citizenship activities. Social support* is not included in this study.

Group membership measures the level of participation in community activities through membership of groups and consists of one question: 'In the last 12 months have you been an active member of any of the following types of groups in your community?' It has seven items with a 9-point response format (ranging from 0 'No active member' to 8 'Very active member'). Example items are 'work related/trade union', 'political group' and 'sports group'. In practice, the items of *group membership* are often somewhat modified to the local context (Tuan et al., 2005; Verduin et al., 2014; Wind et al., 2011). To improve the relevance of the items for the local Dutch context a focus group discussion was held. This focus group consisted of three clinicians working with refugees and a program manager familiar with community networks important to refugees. Changes were made based on consensus. Three categories were added: 'study related', 'grass roots organisation', and 'civil society groups/social organisations', leading to a total of ten items. Total sum scores on this scale can range from 0 to 80. Higher scores indicate more linkages to social groups in society and/or the community. Cronbach's alpha for group membership in the current sample was 0.65.

Citizenship activities measures involvement in citizenship activities. It consists of two questions with a 2-point response format ('0 = no' and '1 = yes'). The two questions are 'In the last 12 months, have you joined together with other community members to address a problem or common issue?' and 'In the last 12 months, have you talked with a local authority or governmental organisation about problems in this community?'. Total sum scores on this scale can range from 0 to 2, with higher scores indicating higher levels of citizenship activities.

The two questions of the SA-SCAT that measure *social support* were not included in this study. Social capital is conceptualized as having community linkages, and trustworthy and reciprocal interactions between community members. Our research focus is on this. Social support, as meant by Harpham et al. (2002) as part of the conceptualization of structural social capital, was considered as an individual factor within these social structures. Therefore it is decided to operationalize structural social capital only as 'group membership' and 'citizenship activities' which both are community factors. Beyond this conceptual argument of redundancy, community-level social capital interventions are likely to reach a wider audience than individual-level interventions, and following Villalonga-Olives et al. (2022) it is considered that (multi-level) interventions targeting a group have more impact on functioning and mental health status of refugees.

Cognitive social capital comprises trust, social harmony, perceiving fairness and sense of belonging. Cognitive social capital is measured by four questions. Three contain a 2-point response format ('0 = no' and '1 = yes'). One item is inversely recoded ('1 = no' and '0 = yes'). Example questions are 'In general, can the majority of people in this community be trusted?' and 'Do you feel as though you are really a part of this community?'. Total sum scores on this scale can range from 0 to 4, with higher scores indicating higher levels of cognitive social capital.

2.2.2. Sense of coherence

Sense of coherence was assessed with the short version of Antonovsky's Sense of Coherence Scale (SOC-13). Sense of coherence is a multidimensional construct, consisting of the dimensions *Comprehensibility, Manageability* and *Meaningfulness*. All three dimensions constantly interact with each other and together form one common overarching factor. Antonovsky maintains that on theoretical grounds, one should avoid lifting out individual dimensions in order to examine them separately (Mittelmark et al., 2017). On this basis it was decided to use the total score of the SOC-13 for the analyses.

The SOC-13 questionnaire consists of 13 questions that have to be answered on a 7-point scale ranging from 1 to 7. Example questions are 'Are you surprised by the behaviour of people whom you thought you knew well?' (1 is 'Never' and 7 is 'Always') and 'How often do you have the feeling that there's little meaning in the things you do in your daily life?' (1 is 'Very often' and 7 is 'Very seldom or never'). Total sum scores on the SOC-13 can range from 13 to 91, with higher scores indicating higher levels of sense of coherence. The Cronbach's alpha of the SOC-13 in the study of Getnet and Alem (2019) within a refugee population was between 0.67 and 0.74. In the current sample the Cronbach's alpha is 0.59.

2.2.3. Mental health

To assess mental health the Mental Health Continuum - short form (MHC-SF) was conducted. It addresses emotional, psychological and social dimensions of well-being (Keyes et al., 2008). The MHC-SF has been shown to have good psychometric properties in adults within various cultural contexts, including the Dutch context (Lamers et al., 2011). The MHC-SF is a relatively brief questionnaire based on the 40-item Mental Health Continuum (Keyes, 2002). Keyes introduces an operationalization of mental health as a syndrome of symptoms of positive feelings and positive functioning in life.

The MHC-SF consists of 14 questions that address how often the respondents have felt a specific phenomenon during the past month, rated on a 6-point scale ranging from 0 'Never' to 5 'Every day'. Every question starts with 'During the past month, how often did you feel … '. Example questions are 'satisfied with life' and 'that you liked most parts of your personality'. Total sum scores on the MHC-SF can range from 0 to 70, with higher scores indicating higher levels of mental health. The Cronbach's alpha in the current sample is 0.89.

2.3. Statistical analyses

One participant was omitted from the analyses as an outlier (0.7%), because the predictor variable in relation to the outcome variable was more than three standard deviations from the mean. This is in accordance with recommendations by Field (2018). The amount of missing data varied between 2 and 4 cases (between 1.3% and 2.6%). Due to missing data varying between different questionnaires, in combination with listwise deletion as the missing data handling procedure, the number of total participants in the different analyses varied between 138 and 143 (between 91.4% and 94.7% of the total sample).

Given the moderate sample size, only a limited number of predictors was included in each regression model. Consequently the decision was made to combine the three categories of citizenship activities into one dummy variable. It was dichotomized into 'no citizenship activities' (total score is 0) and 'some form of citizenship activities' (total score is 1 or 2). For the same reason and because of low endorsement (7.9%) of the first response category, cognitive social capital was dichotomized into low (scored as 0–2) and high (scored as 3–4). This dichotomy classification followed Flores et al. (2014), as initially proposed by De Silva et al. (2006).

Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 27. A 95% significance level was used. The data were randomly checked for inaccuracies and response patterns that indicated an unreliable response pattern. No abnormalities were found.

Multiple regression analysis in which variables were added to the model in separate steps was used to test whether social capital was related to mental health and whether this relation was moderated by sense of coherence. Each step added a new concept to evaluate the unique contribution of the different concepts (structural social capital (group membership and citizenship activities), cognitive social capital and sense of coherence) in relation to mental health. Regression models were evaluated by testing if adding one or more predictors to the regression model led to a significant increase in R^2, and by testing if the individual predictors were significantly related to the outcome variable mental health.

The first hypothesis, 'there is a relation between social capital and mental health' was tested through a multiple regression model. In the first step, structural social capital factors, group membership and citizenship activities were added to the model. In the second step, cognitive social capital was added to this regression model.

The second hypothesis, 'sense of coherence has a moderating effect on this relationship' was tested through three multiple regression models with five predictors: the main-effects of social capital (predictor variable with three subscales – group membership, citizenship activities and cognitive social capital) and sense of coherence (moderator variable) and one interaction effect between one of the social capital subscales and the moderator sense of coherence. The significance of three interaction effects were tested. A significant interaction effect would indicate that the relation between social capital (structural and/or cognitive) and mental health was moderated by sense of coherence. Because of the moderate sample size, it was not considered feasible to test all interaction effects in a single regression model.

For the analysis of the third hypothesis 'sense of coherence has a mediating effect on this relationship', first three regression models were used to test which constructs (social capital, sense of coherence and mental health) were related to each other, as a requirement for testing a mediation effect. If one of the singular relations between the predictor (three social capital subscales) and outcome variable (mental health), predictor (three social capital subscales) and mediator (sense of coherence), or mediator (sense of coherence) and outcome variable (mental health) was not significant, no mediation-effect could exist. When this was the case, the indirect-effect was not tested. The mediation analysis was conducted using the PROCESS macro version 3.5 by Hayes (2020). First, the three singular relations were tested between the predictor (cognitive social capital) and outcome variable (mental health), predictor (cognitive social capital) and mediator (sense of coherence), and mediator (sense of coherence) and outcome variable (mental health). Second, statistical mediation analysis was conducted using nonparametric bootstrapping with 5000 replications to calculate bias-corrected bootstrapped 95% confidence intervals (CIs). An indirect effect was considered significant if the 95% CI did not include zero. When the indirect effect was significant, there was a significant mediation effect.

3. Results

The final sample (N = 151) consisted of a slight majority of women (56%). The average participant was 36 years old. The majority of participants came from Syria (58%), were between four and five years in the Netherlands (38%), and had a residence permit for the Netherlands (84%). Most participants were married (64%). Education levels were varied with larger groups being 'High school' (25%) and 'University' (25%). Table 1 provides further participant characteristics.

In comparison to data from the Central Bureau for Statistics (2022) on asylum seekers entering the Netherlands between 2015 and 2020 it is concluded that our final sample was reasonably representative for a group of refugees in the Netherlands, although single men and some nationalities (e.g. Iraq, Afghanistan, Eritrea) seemed to have been underrepresented. Groups that were more difficult to reach were more actively approached (e.g. Eritreans, refugees without status). Data were gathered in all provinces in the Netherlands to reach a national coverage

Table 1
Demographics (N = 151).

	Mean (standard deviation)	N	Percentage
Sex			
Male		67	44%
Female		84	56%
Age	36.2 (10.8) years	151	
Nationality			
Middle East		17	77%
Syria		88	58%
Iran		12	8%
Africa		15	20%
Eritrea		15	10%
Other		4	3%
Years in the Netherlands	3.2 (1.3) years	151	
Residence permit in the Netherlands			
Yes		127	84%
No		24	16%
Marital status			
Single		38	25%
Married		97	64%
Divorced		9	6%
Other		7	5%
Education level			
No diploma		8	5%
Primary school		28	19%
High school		38	25%
Lower professional education		18	12%
Higher professional education		20	13%
University		38	25%
Other		1	1%

of participants.

3.1. Relation between social capital and mental health

Results of the multiple regression analyses testing the relation between social capital (structural and cognitive) and mental health are presented in Table 2.

In the first step group membership and citizenship activities – both representing structural social capital – were added to the model, accounting for 4.7% of the variance in mental health. Group membership was significantly and positively related to mental health. The association between citizenship activities and mental health was not significant.

As a second step cognitive social capital was added to the model, accounting for an additional 4.1% of the variation in mental health. There was a significant and positive association between cognitive social capital and mental health.

These outcomes suggest that the first hypothesis can be accepted. Both structural social capital (group membership) and cognitive social capital were positively related to the mental health of refugees in the Netherlands.

Table 2
Associations between social capital predictors group membership (GM), citizenship activities (CA) and cognitive social capital (CSC) and mental health (N = 141), expressed in change in R squares and Betas.

	B	SE B	β	Δ R²	R²
Step 1				0.047[a]	0.047
Constant	41.87	2.07			
GM	2.30[a]	0.94	0.21		
CA	1.15	2.39	0.04		
Step 2				0.041[a]	0.088
Constant	39.90	2.18			
GM	2.23[a]	0.92	0.20		
CA	0.64	2.35	0.02		
CSC	5.77[a]	2.32	0.20		

[a] p < 0.05.

3.2. Sense of coherence (SOC) as a moderator

To test whether the association between social capital and mental health was moderated by sense of coherence, three multiple regression analyses were conducted. Results are presented in Table 3.

The three models each consisted of three steps. The first two steps were the same in each of these models. In the first step the social capital variables were added to the model and in the second step SOC was added. The difference between the regression models was introduced in the third step, in which each time a different interaction variable was added to the model to test the interaction between one of the social capital variables and SOC.

Adding the social capital variables to the model in step 1 accounted for 8.9% of the variation in mental health. Group membership and cognitive social capital were positively and significantly associated with mental health, whereas the relation between citizenship activities and mental health was not significant.

Adding SOC to the model in step 2 accounted for an additional 25.2% of the variation in mental health. Group membership and SOC were positively and significantly associated with mental health, whereas the relation between citizenship activities and mental health, as well as cognitive social capital and mental health were not significant.

When in step three the three interaction variables 'GM x SOC', 'CA x SOC' and 'CSC x SOC' were added to the model, they respectively accounted for an additional 0.7%, 0.5% and 0.2% of the variation in mental health. In all three cases group membership and SOC were positively and significantly associated with mental health, whereas the relation between citizenship activities and mental health as well as cognitive social capital and mental health were not significant. Furthermore, the relation of the three interaction variables and mental

Table 3
Associations between social capital predictors group membership (GM), citizenship activities (CA) and cognitive social capital (CSC) and mental health, with sense of coherence (SOC) as a moderator variable (N = 138), expressed in change in R squares and Betas.

	B	SE B	β	Δ R²	R²
Step 1				0.089[a]	0.089
Constant	44.11	1.69			
GM	2.40[a]	0.93	0.22		
CA	0.04	2.37	0.00		
CSC	5.41[a]	2.35	0.19		
Step 2				0.252[a]	0.341
Constant	45.97	1.47			
GM	1.88[a]	0.80	0.17		
CA	−0.07	2.03	−0.00		
CSC	0.97	2.10	0.03		
SOC	0.69[a]	0.10	0.53		
Step 3a				0.007	0.348
Constant	46.18	1.48			
GM	2.07[a]	0.81	0.19		
CA	−0.05	2.02	−0.00		
CSC	0.74	2.10	0.03		
SOC	0.68[a]	0.10	0.52		
GM x SOC	−0.09	0.08	−0.09		
Step 3b				0.005	0.346
Constant	45.90	1.47			
GM	1.91[a]	0.80	0.17		
CA	−0.06	2.03	−0.00		
CSC	1.26	2.12	0.04		
SOC	0.75[a]	0.11	0.58		
CA x SOC	−0.21	0.20	−0.09		
Step 3c				0.002	0.343
Constant	46.06	1.48			
GM	1.81[a]	0.81	0.16		
CA	0.04	2.04	0.00		
CSC	1.11	2.12	0.04		
SOC	0.74[a]	0.13	0.57		
CSC x SOC	−0.12	0.20	−0.06		

[a] p < 0.05.

health were not significant.

In conclusion these results suggest that sense of coherence did not moderate the relation between social capital and mental health. Thereby, the second hypothesis is rejected.

3.3. Sense of coherence (SOC) as a mediator

Results of the regression analyses testing whether SOC mediates the relation between social capital and mental health are presented in Table 4. First, three separate regression analyses were conducted to analyse the relations between social capital and mental health, SOC and mental health, and social capital and SOC. These relations were a precondition for a possible mediation effect.

In the first model, the social capital variables were regressed on mental health and explained 8.8% of the variance in mental health. There was a significant and positive relation between mental health and group membership as well as cognitive social capital. The second model tested if SOC is related to mental health. SOC explained 30.3% of the variance in mental health. There was a significant and positive relation between sense of coherence and mental health. In the third model group membership, citizenship activities and cognitive social capital were regressed on SOC and together they explained 8.9% of the variance in SOC. There was a significant, positive relation between cognitive social capital and SOC.

Based on the precondition and these outcomes, a mediation analysis was conducted to test whether the relation between cognitive social capital and mental health is mediated by SOC. There was a significant indirect effect between cognitive social capital and mental health through SOC, indicating that the relation between cognitive social capital and mental health is completely mediated by SOC.

These results suggest that the third hypothesis can be partially accepted, since there was no mediation effect of SOC on the relation between structural social capital and mental health.

Analyses of the variables of interest were performed to ensure no violation occurred of the assumptions of normality, linearity, and homoscedasticity. It was found that the data showed heteroscedasticity. To check whether this impacted the results heteroscedasticity was reduced by removing outliers and transforming the mental health score into a natural logarithm. These actions resulted in homoscedasticity of the residual. As a next step the regression analyses were repeated with the transformed mental health score. In comparison to the original analyses, there were no differences between the results. Based on that, the conclusion was drawn that violations of the regression assumptions did not have a noteworthy influence on the results. For this reason the results of the original model are presented.

4. Discussion

This study showed a modest positive relationship between structural (group membership) and cognitive social capital and mental health, and a strong positive relationship between sense of coherence and mental health. The explained variance of sense of coherence was higher than that of social capital, which highlights the importance of sense of coherence in mental health and the contribution of sense of coherence to differences in mental health (Johnson et al., 2017).

It has been debated which moderating and mediating factors contribute to the relation between social capital and mental health (Wind & Komproe, 2018). Our findings suggest that sense of coherence plays a key role in this relationship: structural social capital (being part of a social network) was directly related to mental health, but cognitive social capital (having trustworthy, reciprocal and supportive relationships) in itself was indirectly related to mental health, via sense of coherence.

In other words, refugees who perceive and value their environment as trusting and supportive, may consequently perceive their environment as more manageable and feel more sense of direction in their lives (i.e. have a higher sense of coherence), may ultimately have better mental health. This mediation effect further supports the idea of Maulana et al. (2021) that having trustworthy, reciprocal and supportive relationships and control in a stressful situation reinforces one's self-confidence in managing future risks and stresses, contributing to a better mental health.

Antonovsky (1996) hypothesized a moderating or buffering effect of sense of coherence on the relationship between social capital and mental health. However, we found no support for this moderating relationship, suggesting that sense of coherence did not enhance the relationship between social capital (structural and cognitive) and mental health. Additionally, according to Schäfer et al. (2019) an initially high sense of coherence may function in a protective manner since it may give a refugee confidence in their ability to cope with the enduring adversity as well as it may create an opportunity to return to their prior assumptions of a structured and controllable world.

Our findings suggest that strengthening social capital and in particular sense of coherence may contribute to a better mental health in refugees. This means that social ties and networks, although rarely visible, are an incredibly powerful and valuable resource (Elliot et al., 2012). When people have a high level of sense of community and trust their community members, they can rely on community sources to overcome stressors. For a refugee a sense of understanding, manageability and meaning of one's life and actions has a strong positive influence on the possibility to form trusting relationships and to enhance mental health. This mechanism further supports the idea that having control in a stressful situation and trusting in other people reinforces one's self-confidence in managing future risks and stressors (Ahadzie et al., 2016; Almedon, 2005b; Mittelmark et al., 2017).

Schölmerich and Kawachi (2016) recommended adopting a socio-ecological perspective into public health practices. Connecting different levels (intrapersonal, interpersonal, organisational, community, and policy) could lead to an increased impact of a public health intervention. As both individual and community interventions may impact mental health of an individual, a multilevel approach needs to be adopted (Villalonga-Olives et al., 2022; Wind & Villalonga-Olives,

Table 4

Regression models of social capital predictors group membership (GM), citizenship activities (CA), cognitive social capital (CSC), sense of coherence (SOC) and mental health (expressed in R squares and Betas), and a mediation analyses with SOC as mediator.

	B	SE B	β	R^2
Model 1 – Outcome variable mental health (N = 141)				0.088[a]
Constant	39.90	2.18		
GM	2.23[a]	0.92	0.20	
CA	0.64	2.35	0.02	
CSC	5.77[a]	2.32	0.20	
Model 2 – Outcome variable mental health (N = 143)				0.303[a]
Constant	5.57	5.27		
SOC	0.72[a]	0.09	0.55	
Model 3 – Outcome variable SOC (N = 141)				0.089[a]
Constant	52.74	1.68		
GM	0.82	0.72	0.09	
CA	−0.53	1.82	−0.02	
CSC	6.16[a]	1.81	0.28	

	B	SE B	Bootstrapped 95% CI	
			Lower	Upper
Test of indirect effects (N = 143)				
GM – SOC – Mental health	N.A.	N.A.	N.A.	N.A.
CA – SOC – Mental health	N.A.	N.A.	N.A.	N.A.
CSC – SOC – Mental health	4.28	1.28	1.94	6.92

N.A. = not applicable; nonparametric bootstrapping with 5000 replications to calculate bias-corrected bootstrapped 95% confidence intervals (CI).

[a] p < 0.05.

2019). Within this discourse, our study contributes to a better understanding of how an interplay between factors can help to comprehend which existing preventive mental health interventions are most efficient and meaningful (Aguirre-Molina & Gorman, 1996; LeMaster et al., 2018; Villalonga-Olives et al., 2018; Ying et al., 1997): interventions that focus on strengthening connections to social networks or that enhance a feeling of comprehensibility and/or manageability and/or meaningfulness over one's life.

For example, interventions that bolster resilience by addressing sense of coherence could increase the receptiveness to benefit from resources, such as interpersonal supportive relationships. At the same time, structural social capital could be increased by promoting group membership and citizen activities. We argue that at a community level, policy makers should be especially aware of the detrimental effect of a lengthy asylum procedure on social capital or sense of coherence. Earlier studies showed that lengthy asylum procedures may contribute to mental deterioration, despair and a higher risk of psychiatric disorders amongst refugees (Hvidtfeldt et al., 2020; Procter et al., 2018), and that social capital increases with acculturation (Valencia-Garcia et al., 2012). Our empirical framework indicates that a prompt asylum procedure and acculturation are ways to boost sense of coherence and thus mental health among refugees.

4.1. Limitations

This study suffered from several shortcomings. First, the cross-sectional design did not allow for the establishment of a causal relationship between social capital, sense of coherence and mental health. It is recommended to further confirm the outcomes in a future prospective longitudinal study. Second, this is a convenience sample, whose participants may have had higher structural and cognitive social capital than the average refugee. Third, representativeness of the group was hampered. For instance, because questionnaires were available only in Dutch, English and Arabic, it was not possible to include illiterate refugees or those who speak other languages (e.g. Tigrinya, French, Farsi). Fourth, due to the limited sample size, only a restricted number of variables and no confounders could be included in the analyses and generalisation of conclusions are limited. In a future study it is recommended to include demographic variables (i.e. education, marital status, age and gender) to see their effect on the main findings, as this can be important both for research and intervention purposes. Fifth, the internal consistency of the SOC-13 and group membership of the SA-SCAT were low, indicating that these particular scales may be unreliable for this population. As a result the analyses including sense of coherence and group membership should be interpreted with caution. A possible explanation could be that participants found it difficult to understand the complex and conceptual nature of the questions.

5. Conclusion

This study contributes to the literature by demonstrating the beneficial interplay between social capital, sense of coherence and mental health of refugees (Hoge et al., 2007; Arnetz et al., 2013). Our findings may guide policy makers and clinicians to focus on preventive interventions aiming to enhance refugees' mental health. Existing mental health interventions may gain in effectiveness by including resiliency factors and strengthening social mechanisms (Aguirre-Molina & Gorman, 1996; Schölmerich & Kawachi, 2016; Ying et al., 1997). Given the large numbers of refugees in the world today, this study is an invitation to dissect the individual and the social mechanisms that determine mental health. More research is needed to understand these multifactor mechanisms to provide a more nuanced picture of how previously experienced trauma, post migration stressors, social capital and sense of coherence affect mental health outcomes of refugees.

Ethical statement

None.

Author statement

Declaration of compting interest

The authors declare no conflict of interest.

Data availability

Data will be made available on request.

Acknowledgements

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