Psychiatry Research 271 (2019) 200–207

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

The effect of discrimination on depression and anxiety symptoms and the buffering role of social capital among female domestic workers in Macao, China

Brian J. Hall, Cheila Alexis C. Pangan, Edward W.W. Chan, Rebecca L. Huang

Global and Community Mental Health Research Group, University of Macau, Faculty of Social Sciences, E21-3040, Avenida da Universidade, Taipa, Macau (SAR), People's Republic of China

ARTICLE INFO

Keywords:
Social capital
Depression
Discrimination
Migrant workers
Female domestic workers

ABSTRACT

Foreign migrant domestic workers experience an increased burden of mental disorders. Discrimination contributes to this burden. Social resources may buffer migrants from the effects of this discrimination. The present study explored the relationship between discrimination and common mental disorder (CMD) symptoms, anxiety and depression, and examined whether social capital (cognitive and structural) modified this association. A total of 131 female migrant Filipina domestic workers in Macao, China (M_{age} = 39.7) were sampled using snowball methods. Self-report data were obtained using tablet devices. Correlation analyses demonstrated that discrimination was significantly associated with depression (r_s = 0.43) and anxiety (r_s = 0.42). Mulitvariable regressions showed that cognitive, but not structural, social capital was significantly negatively associated with depression (β = −0.30) and anxiety (β = −0.32). Cognitive social capital modified the association between discrimination and depression (β = 0.39) and anxiety (β = 0.53). Contrary to predictions, as discrimination increased, compared to those with no cognitive social capital, those with moderate or high levels of cognitive social capital experienced worsening CMD symptoms. This finding provides greater nuance to our understanding of how and under what circumstances social resources are protective for mental health for migrant workers.

1. Introduction

Migration increases vulnerability to poor mental health (Bhugra, 2004; Carballo et al., 1998; Zimmerman et al., 2011). Discrimination from the host country population is a key social determinant that further contributes to negative health outcomes (Allen et al., 2017; Chae et al., 2012; Chen et al., 2017; Gee et al., 2007; Karlsen and Nazroo, 2002; Nadimpalli et al., 2015; Nakash et al., 2012). Migrant domestic workers are vulnerable to experiencing discrimination as they are considered low skilled workers, from poor countries, who may not be seen as equal to their employers (Hall et al., under review). Identifying naturally occurring protective factors that can mitigate the harms of discrimination and migrant stress is a key research priority to improve migrant health. The purpose of the current study was to investigate whether social capital, a social resource associated with mental health (De Silva et al., 2005b), might be negatively associated with depressive and anxiety symptom severity among migrant domestic workers in Macao, China.

1.1. Migration and migrant domestic workers

The number of international migrants worldwide reached 232 million in 2013 (United Nations Department of Economic and Social Affairs Population Division, 2013) with an estimated total of 150 million as migrant workers (International Labour Office, 2015). The ILO (2015) also estimated that, among the labor migrants, 11.5 million are employed as domestic workers across the world, of which about 73.4% or 8.5 million are women.

In Macao, China, the Public Security Police Force reported that by the end of July 2016, there were more than 24,000 domestic workers, of which over 12,000 were Filipino domestic workers (DSAL, 2016). Filipinos accounted for half of the non-resident domestic workers in Macao. As domestic workers occupy a significant part of the labor force around the world, they are confronted with challenges in their migration experiences (van der Ham et al., 2015), such as labor exploitation (International Labour Office, 2013).

E-mail address: brianhall@umac.mo (B.J. Hall).

https://doi.org/10.1016/j.psychres.2018.11.050
Received 7 March 2018; Received in revised form 14 September 2018; Accepted 21 November 2018
Available online 22 November 2018
0165-1781/

1.2. Domestic worker stressors

Limited research is available on migrant domestic workers. Generally, migration is a stressful process (Zimmerman et al., 2011) related to a wide range of physical and mental health problems (Bhugra, 2004; Carballo et al., 1998). Carballo et al. (1998) reported that a variety of health issues followed migration, including physical health problems, such as cardiovascular diseases and sexually transmitted diseases; and psychosocial problems, such as depression and anxiety. Other studies demonstrated that domestic workers have poor access to supportive networks (Mendoza et al., 2017), mental health services (Hall et al., 2018), and experience chronic separation from loved ones (Garabiles et al., 2017). Likewise, in a study by van der Ham and her colleagues (2015), Filipino domestic workers reported experiencing higher levels of stress during migration and that their main causes of stress included feelings of loneliness and homesickness as well as poor working conditions. This study also noted exposures to poor working conditions, such as experiencing conflict with employers, lack of rest, and lack of food (van der Ham et al., 2015).

Domestic workers are a vulnerable migrant population (El-Hilu et al., 1990; Lau et al., 2009; van der Ham et al., 2015; Zahid et al., 2003). According to the International Labor Organization ILO (2013), they are often not recognized as workers by host governments and therefore are frequently excluded from the same labor and social protections that other workers have. This exposes domestic workers to less than favorable working conditions which in turn affects their well-being (Holroyd et al., 2001; Lau et al., 2009). They may work long hours and have few holidays and rest periods (Hall et al., under review). In addition to the stress of migration and the challenges that their work presents, domestic workers encounter discrimination that may influence their psychological well-being.

1.3. Perceived discrimination and depression and anxiety

As a minority group, female Filipino domestic workers are exposed to discrimination, which may negatively impact their mental health. Depression and anxiety are debilitating common mental health disorders (CMDs) that can have a significant impact on both the individual and society. Both disorders are related to impaired work performance (Beck et al., 2011; Bokma et al., 2017; Ford et al., 2011; Kessler and Bromet, 2013), and to considerable economic burden (Cuijpers et al., 2007; Kessler and Greenberg, 2002). Depression is reportedly associated with reduced functional abilities and quality of life (Spijker et al., 2004); and anxiety is negatively associated with physical, psychological, and health-related behaviors (Ford et al., 2011). Depression and anxiety are also linked to migration (Bhugra, 2004; Carballo et al., 1998; Lindert et al., 2009), and the migrants' increased susceptibility to CMDs is attributable to the concept of loss (of status and social support) and acculturative stress (Bhugra, 2004).

Greater exposure to perceived discrimination affects health (Allen et al., 2017; Bogart et al., 2011; Chae et al., 2012; Gee et al., 2007; Karlsen and Nazroo, 2002; Nadimpalli et al., 2015; Nakash et al., 2012). Karlsen and Nazroo (2002) stated that interpersonal as well as perceived racism both have negative health consequences among ethnic minority groups in lower socioeconomic status. Likewise, studies showed that discrimination contributes to negative mental health among ethnic minorities (Cano et al., 2016; Gee et al., 2007), and that perceived discrimination predicts depressive symptoms among migrants (Chou, 2012).

1.4. Social capital

The association between social support and mental health is mixed in studies of Filipino domestic workers. Van der Ham and her colleagues (2014) showed that social resources played an important role in alleviating stress among migrant domestic workers. However, in another study of 261 female Filipino domestic workers in Macao, higher levels of social support were associated with greater CMD symptom severity (Mendoza et al., 2017). In addition to social support, social capital is the subject of recent studies aimed at identifying the benefits that may be accrued through social relationships. This concept is broader than social support and encompasses the resources available through group membership and the beliefs about whether you might be able to access those resources.

Social capital is multidimensional, consisting of structural, cognitive, bonding, bridging, and linking components (De Silva et al., 2005a, 2005b, 2007; McKenzie et al., 2002; Szreter and Woolcock, 2004). Structural social capital refers to the number of social relationships, such as the size of the social network or the number of groups a person is a member. Cognitive social capital is the perception of the quality of social relationships as defined by the norms of trust and reciprocity, sharing and support (De Silva et al., 2005b; Szreter and Woolcock, 2004). As illustrated by De Silva et al. (2005b) as well as Szreter and Woolcock (2004), concerning linkages and perceptions, structural and cognitive social capital may bond individuals within their own community (bonding social capital), bridge people of different communities or of different social identities (bridging social capital), or link groups of different levels of power and influence in the society (linking social capital).

Cognitive social capital is associated with CMDs (De Silva et al., 2005b; Stafford et al., 2008). In a systematic review of social capital and all mental disorders, De Silva et al (2005b) showed a consistent inverse association between CMDs and cognitive social capital. In a separate study, cognitive social capital was associated with reduced odds of CMDs among people in low income countries (De Silva et al., 2005a). These findings suggest that social capital, specifically cognitive social capital, may be associated with fewer mental health problems. Structural social capital was not linked to fewer mental health symptoms, so it is not clear whether this form of social capital would provide benefit among migrants. However, to our knowledge, no previous study demonstrated this effect among migrant workers.

Although ample research has provided evidence on the positive relationship between social capital and mental health (De Silva et al., 2005b), there is a dearth of research on social capital as a mitigating factor on mental health implications of stressors relating to migrants. In host countries, social capital may function as a protective buffer against the discrimination migrants experience. An investigation of the effect of social capital among Filipino domestic workers in Macao would provide a test of the benefit of bonding social capital within a context where there are few supports available from the host country.

Based on previous research, we tested the following hypotheses:

1 Discrimination is positively associated with anxiety and depressive symptom severity.
2 Cognitive social capital is negatively associated with depression and anxiety symptom severity whereas structural social capital is not.
3 Cognitive but not structural social capital modifies the association between discrimination and depression and anxiety, such that as discrimination increases, those with higher levels of cognitive social capital would report lower depression and anxiety symptom severity.

2. Method

The present study was conducted from March to October 2016 in Macao, China. Participants were recruited using snowball sampling methods through a local nongovernmental organization (NGO) in Macao.

2.1. Participants

All participants were female Filipina domestic workers living and

working in Macao at the time of the study. The total sample size was $N = 131$ with a mean age of 39.7 ($SD = 8.3$, range 21 to 59).

2.2. Methods

Survey data were collected at the local NGO study site through tablet devices, or at another convenient and private location where the domestic worker felt comfortable. The Research Ethics Panel at the University of Macau provided ethics approval. Informed consent was obtained from all participants prior to their participation. Participants were remunerated with a small amount of cash (equal to ~12USD) when they finished.

2.3. Measures

Translated Filipino versions of the Patient Health Questionniare-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) available from Pfizer Inc. were used. The everyday discrimination scale and the SASCAT tools both underwent rigorous translation procedures into Filipino (Van Ommeren et al., 1999). Items were forward translated by two people, reconciled, and back translated by two people, and reconciled again, before undergoing cognitive testing to ensure the items were understood by the participants (Collins, 2003), and finally pilot testing before administration.

2.3.1. The patient health questionnaire (PHQ-9)

The PHQ-9 is a self-administered questionnaire used to assess depressive symptoms and consists of the 9 items found within DSM-5 diagnostic system (Kroenke et al., 2001). The scale is rated from 0 (not at all) to 3 (nearly everyday), and the severity of depression is measured with scores with a potential range from 0 to 27. Higher total scores indicated higher depression symptom severity. Depressive symptoms that occurred in the past two weeks were assessed. Previous studies established construct and criterion validity for the scale among Filipino domestic workers (Garabiles et al., under review; Mordeno et al., 2018). Reliability of the scale was excellent in the current study (Cronbach's alpha = 0.78).

2.3.2. Generalized anxiety disorder 7-item scale (GAD-7)

The GAD-7 was used to measure anxiety symptoms (Spitzer et al., 2006). It consists of seven items, scored from 0 (not at all) to 3 (nearly every day), with an anxiety symptom severity score that can be measured from 0 to 21. Crierion validity of this scale was established in a previous study (Garabiles et al., under review). Its reliability in the present study was excellent (Cronbach's alpha = 0.82).

2.3.3. The everyday discrimination scale (EDS)

The EDS was used to evaluate chronic and regular experiences of unfair treatment (Williams et al., 1997). This is the most widely used scale to assess discrimination. The 9-item scale included experiences such as 'You are treated with less courtesy than other people,' 'You receive poorer service than other people at restaurants or stores,' rated on a 6-point Likert-type scale of its frequency, ranged from "0″ (Never) to "5″ (Almost everyday). Higher scores indicate greater perceived discrimination. Reliability of the scale was excellent in the current study (Cronbach's alpha = 0.87).

2.3.4. Adapted social capital assessment tool

The scale has been shown to be a valid tool to assess cognitive and structural forms of social capital (De Silva et al., 2006). It consists of 38 items that examine three aspects of structural social capital (group membership, support from individuals in the community, and citizenship activities) as well as cognitive social capital items (trust, social harmony, perceived fairness, and sense of belonging). The measure was adapted for the domestic workers by including specific group membership items (e.g., Filipino associations), we learned about in formative work (Hall, et al., under review). Responses are reported dichotomously (Yes or No), and responses are summed to create an index of social capital.

2.3.5. Demographic information

Demographic information obtained consisted of sex, age, educational level, years working in Macao, language proficiency in Cantonese (oral and listening).

2.4. Statistical analysis

Descriptive statistics were used to establish frequencies of variables. Spearman correlation analyses were conducted to examine interrelationships between depression, anxiety, and perceived discrimination since the variables were non-normally distributed. Robust regression analyses were conducted to determine which domain(s) among social capital had significant associations with depression and anxiety (Li, 1985). Multiple regression models were then tested for main and moderating effects of the social capital domains for depression and anxiety in separate analyses. Demographic characteristics including age, educational level, marital status, number of years working as a domestic worker in Macao, ability to understand and speak Cantonese, were included as confounding variables in all models due to their theoretical association between social resources and well-being (Chen and Yang, 2014; van der Ham et al., 2014). Significance level was set at $p < 0.05$ for all analyses.

Demographic characteristics were included in Model 1 for each analysis. Dummy variables indicating educational level and marital status were added. Perceived discrimination was entered in Model 2. The related social capital domains were incorporated into Model 3. Interaction terms representing the interaction between social capital and perceived discrimination were included in Model 4.

3. Results

3.1. Description of participants

Among 131 participants, 41.2% were between 35–44 years old (mean age 39.7). More than 40 participants (35.1%) were married and 39 participants (29.8%) were single. The majority of the participants (58.0%) reported attending some college or graduating from college. The median working years of the participants in Macao was 4.00 (range 0–19 years, mean 5.1, SD 3.6). Language level was assessed from a self-report rating of 1 to 10 (1 being completely unable to understand and 10 being extremely fluent), and most of the participants (65.7%) reported their level of understanding Cantonese at 2 or below. Using standard cut scores of 10 or higher for screening on the PHQ-9 and GAD-7, the prevalence of depression and anxiety was 14.5% and 17.6%, respectively. See Table 1 for participant characteristics.

3.2. Correlation results

Spearman correlation analyses were used to analyze the relationships among perceived discrimination, depression, and anxiety (Table 2) because distributions of all varaibles violated the normality assumption (Shapiro-Wilk's test; all $ps < 0.005$). Results showed depression and anxiety were significantly positively correlated with each other ($r_s = 0.72$, $p < 0.0001$), and perceived discrimination was significantly positively associated with depression ($r_s = 0.43$, $p < 0.0001$) and anxiety ($r_s = 0.42$, $p < 0.0001$) symptom severity. Educational attainment was significantly negatively associated with depression ($r_s = -0.20$, $p = 0.023$). A negative association was found to be significant between local language comprehension (i.e., ability to understand Cantonese) and depression ($r_s = -0.23$, $p = 0.010$) as well as anxiety ($r_s = -0.20$, $p = 0.019$). But local language fluency (i.e., ability to speak Cantonese) was not significantly associated with any

Table 1
Participant characteristics.

	M	*SD*
Age	39.7	8.3
Understanding Cantonese	2.4	1.8
Speaking Cantonese	2.3	1.6
Years of working as a domestic worker	5.1	3.6
	N	%
Educational attainment		
High school	30	22.9
Technical/Vocational	25	19.1
College Undergraduate	39	29.8
Bachelor's Degree	37	28.2
Marital Status		
Single, never married	39	29.8
Married	46	35.1
Separated	29	22.1
Widow	10	7.6
Living with partner	7	5.3

Note. *M* = mean; SD = standard deviation; Understanding and speaking Cantonese range was from 1 to 10.

CMDs (all *ps* > 0.05). Results from Spearman correlation analyses between cognitive and structural social capital and depression, anxiety, and discrimination revealed thatcognitive social capital was significantly and negatively associated with depression ($r_s = -0.019$, $p = 0.03$) but not anxiety ($r_s = -0.016$, $p > 0.05$) (Table 3).

3.3. Regression results

Moderated multiple regression analysis was used to examine the effect of the moderator variables–cognitive and structural social capital–on the relationship between perceived discrimination and depression and anxiety. Results of Shapiro–Wilk's W test of normality suggested residuals were unlikely normally distributed (S–$W = 0.97$, $p = 0.002$). Robust regression was thus conducted with incremental predictors added to each model (Li, 1985). In Model 1, age, educational level, marital status, number of years of working as a domestic worker in Macao, and local language comprehension were included as independent variables. Perceived discrimination was added to Model 2, which was retained along with potentially confounding variables in the following models. Adding perceived discrimination in Model 2 resulted in a significant increase in R^2 ($p < 0.001$). Cognitive and structural social capital domains were added to Model 3 but yielded no significant difference in incremental variance from Model 2. Finally, interaction terms (perceived discrimination × cognitive social capital and perceived discrimination × structural social capital) were added to Model 4. Results showed that a total of 30.0% of the variance was explained by all hypothesized predictors, $R^2 = 0.29$, F (15, 114) = 6.19, $p < 0.0001$.

Table 3
Spearman correlations between depression, anxiety, perceived discrimination, and social capital.

	PHQ-9	GAD-7	EDS
Cognitive social capital	−0.19*	−0.16	−0.13
Structural social capital	0.02	−0.01	0.02

Note. PHQ-9 = patient health questionnaire; GAD-7 = generalized anxiety disorder; EDS = everyday discrimination scale.
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Incremental variance explained by the interaction terms in Model 4 was significant ($\Delta R^2 = 0.03$, $p < 0.001$). The perceived discrimination × cognitive social capital interaction was significant for depressive symptoms (β = 0.39, $p = 0.016$), whereas the interaction between perceived discrimination and structural social capital was not ($p = 0.826$) (Table 4).

Similar results were found for the anxiety model (Table 5). Significant incremental variance was explained in Models 2 and 4 when perceived discrimination and interaction terms were respectively included in the analyses (both *ps* < 0.001). A total of 28.0% of the variance was explained, $R^2 = 0.28$, F (15, 114) = 4.54, $p < 0.0001$. Cognitive social capital modified the relationship between anxiety and perceived discrimination (β = 0.53, $p = 0.004$). The interaction terms in both sets of analyses indicated that as social capital increased, those who experienced higher levels of discrimination reported greater CMD symptom severity (see Figs. 1 and 2).

4. Discussion

The current study investigated the association between discrimination and anxiety and depressive symptoms, and tested whether social capital modified this relationship, among Filipino migrant domestic workers in Macao, China. Discrimination was associated with higher levels of depression and anxiety in this sample. Cognitive social capital was significantly associated with less depressive and anxiety symptoms, and modified the association between perceived discrimination and depression and anxiety, but not in the way expected.

Consistent with our first hypothesis, higher levels of perceived discrimination were associated with greater depressive and anxiety symptoms. This finding is consistent with established literature in which perceived discrimination is associated with poorer mental health, particularly among migrant and ethnic minority groups (Allen et al., 2017; Bogart et al., 2011; Cano et al., 2016; Chou, 2012; Gee et al., 2007; Nakash et al., 2012). This is among the first tests of this association within a Chinese society (see also Tonsing, 2013) where the source of discrimination is a Chinese host population towards another Asian ethnic group. This finding broadens the foundation for future investigations of intergroup discrimination within an East Asian context

Table 2
Intercorrelations between demographic variables, depression, anxiety, and perceived discrimination.

	PHQ-9	GAD-7	EDS	Age	Education	Years in Macao	Speaking Cantonese	Understanding Cantonese
PHQ-9	1.00							
GAD-7	0.71***	1.00						
EDS	0.43***	0.42***	1.00					
Age	−0.02	0.02	−0.07	1.00				
Education	−0.19*	−0.05	0.07	0.07	1.00			
Years in Macao	0.07	0.04	−0.00	0.34***	−0.05	1.00		
Speaking Cantonese	−0.16	−0.18	−0.09	−0.02	0.10	0.00	1.00	
Understanding Cantonese	−0.23**	−0.21*	−0.16	−0.04	0.14	−0.04	0.70***	1.00

Note. PHQ-9 = patient health questionnaire; GAD-7 = generalized anxiety disorder; EDS = everyday discrimination scale.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 4
Hierarchical linear regression models predicting depressive symptom severity Social Capital on Discrimination and Depression: Main effect and Moderating Models.

	Model 2		Model 3		Model 4	
	B (SE)	β	*B (SE)*	β	*B (SE)*	β
Age	0.02 (0.04)	0.05	0.02 (0.04)	0.03	0.02 (0.04)	0.05
Years in Macao	0.11 (0.10)	0.09	0.14 (0.11)	0.11	0.10 (0.10)	0.08
Educational level						
Technical/vocational	0.38 (1.34)	0.03	0.43 (1.36)	0.04	0.40 (1.34)	0.04
Some college	−1.74 (1.06)	−0.18	−1.60 (1.05)	−0.16	−1.63 (1.02)	−0.17
College (Bachelor's Degree)	−1.34 (0.96)	−0.14	−1.23 (0.96)	−0.12	−1.15 (0.98)	−0.12
Marital Status						
Married	0.66 (0.86)	0.07	0.77 (0.87)	0.08	0.93 (0.87)	0.10
Separated	0.80 (1.04)	0.07	0.89 (1.07)	0.08	1.20 (1.07)	0.11
Widow	−2.77**(0.95)	−0.16	−2.48* (1.01)	−0.14	−2.61*(1.15)	−0.15
Living-in with a partner	3.01 (2.36)	0.15	3.27 (2.33)	0.17	3.49 (2.33)	0.18
Ability understanding Cantonese	−0.37* (0.18)	−0.14	−0.35 (0.19)	−0.14	−0.38* (0.18)	−0.15
Perceived discrimination	0.20*** (0.05)	0.30	0.20*** (0.05)	0.29	0.00 (0.13)	0.00
Cognitive social capital			−0.50 (0.36)	−0.11	−1.33** (0.47)	−0.30
Structural social capital			−0.01(0.06)	−0.01	−0.00 (0.08)	−0.00
EDS × Cognitive social capital					0.13* (0.05)	0.39
EDS × Structural social capital					−0.00 (0.01)	−0.04
R^2	0.26		0.27		0.30	
Adjusted R^2	0.19		0.19		0.21	
F-test for model	9.64***		8.22***		6.84***	

Note. SE = standard errors. EDS = everyday discrimination scale.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 5
Hierarchical linear regression models predicting anxiety symptom severity.

	Model 2		Model 3		Model 4	
	B (SE)	β	B (SE)	β	B (SE)	β
Age	0.05 (0.05)	0.09	0.04 (0.05)	0.08	0. 05 (0.05)	0.10
Years in Macao	0.11 (0.13)	0.09	0.12 (0.13)	0.10	0.06 (0.13)	0.05
Educational level						
Technical/vocational	0.26 (1.28)	0.02	0.31 (1.26)	0.03	0.27 (1.22)	0.02
Some college	−1.47 (1.03)	−0.15	−1.38 (1.01)	−0.14	−1.41 (0.98)	−0.14
College (Bachelor's Degree)	−0.37 (1.10)	−0.04	−0.29 (1.11)	−0.03	−0.15 (1.11)	−0.02
Marital Status						
Married	−0.16 (0.98)	−0.02	−0.10 (0.99)	−0.01	0.11 (0.95)	0.01
Separated	−0.21 (1.18)	−0.02	−0.15 (1.18)	−0.01	0.24 (1.15)	0.02
Widow	−2.23 (1.18)	−0.13	−2.06 (1.20)	−0.12	−2.24 (1.26)	−0.13
Living-in with a partner	0.67 (1.47)	0.03	0.78 (1.44)	0.04	1.08 (1.45)	0.05
Ability understanding Cantonese	−0.21 (0.22)	−0.08	−0.21 (0.22)	−0.08	−0.24 (0.23)	−0.09
Perceived discrimination	0.26*** (0.05)	0.38	0.25*** (0.05)	0.38	0.01 (0.13)	0.02
Cognitive social capital			−0.26 (0.40)	−0.06	−1.39* (0.54)	−0.32
Structural social capital			−0.01 (0.07)	−0.02	0.01 (0.08)	0.01
EDS × Cognitive social capital					0.18** (0.06)	0.53
EDS × Structural social capital					−0.00 (0.01)	−0.09
R^2	0.22		0.22		0.28	
Adjusted R^2	0.15		0.14		0.18	
F-test for model	4.77***		3.82***		4.54***	

Note. SE = standard errors; EDS = everyday discrimination scale.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

and contextualizes this as a key and potentially modifiable social determinant of mental ill health among migrant Filipino domestic workers.

Our second hypothesis was partially supported. Cognitive social capital was negatively correlated with depression (but not anxiety) whereas *structural* social capital was unrelated to both of these symptoms. These findings are consistent with a recent systematic review demonstrating this association (De Silva et al., 2005b). De Silva et al. (2007) argued that the nature of social capital depends on the cultural context, it can also be argued that the lack of association between cognitive social capital and anxiety depends on the norms of behavior and networks that characterize the setting of female domestic workers in Macao. Unlike structural social capital, which can be quantified and observed, cognitive social capital is more appraisal-based and not easily observable. This means that individuals may perceive themselves to have low levels of cognitive social capital, and these perceptions may be influenced by the symptoms of common mental disorders (Hall et al., 2014b). Future research should investigate these associations utilizing longitudinal data to better tease apart temporal precedence of social capital and CMDs.

Structural social capital was unrelated to depression and anxiety symptoms. This is consistent with several previous studies. Chang et al. (2016) found that, compared to Westerners, belonging to multiple groups was less beneficial to the psychological well-being of

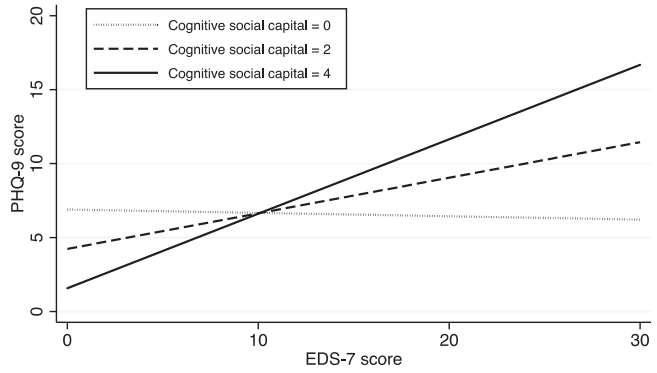

Fig. 1. Cognitive social capital modifies the association between perceived discrimination on depressive symptom severity.

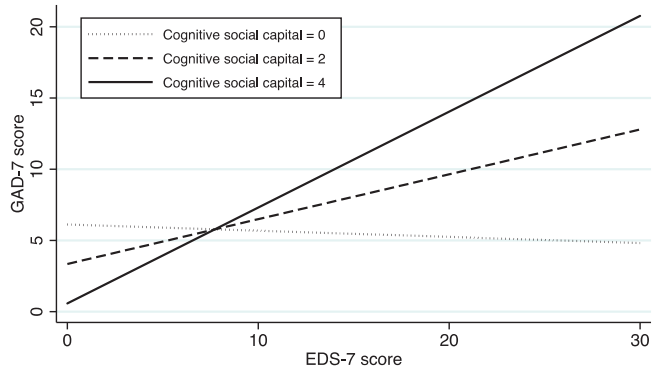

Fig. 2. Cognitive social capital modifies the association between perceived discrimination on anxiety symptom severity.

Asians, specifically those who were least reluctant to seek social support due to concerns about burdening others. An alternative explanation showed that the protective effects of social support may not be uniform across society (Kawachi and Berkman, 2001). Kawachi and Berkman (2001) contended that social connections may increase symptoms of mental disorder among women with low resources, particularly if such connections involve role strain–*emotional labor*–associated with responsibilities to provided social support to others.

Structural forms of capital vary by the community under study. Not all community members are engaged in religious groups, or livelihood groups for example, and adaption is needed to tailor the measurement of social capital to a specific community being studied (De Silva et al., 2005b, 2007). Consistent with these recommendations, we did adapt our social capital measure to include group membership in a variety of associations that domestic workers suggested were important during our formative research (Hall et al., under review). However, it appears that membership in these groups may not be associated with better mental health, nor did group membership buffer the experiences of discrimination. This suggests that interventions aimed to increase membership in social groups may not be sufficient to improve mental health for all communities (Gotlib and Joormann, 2010), and further highlights the need to evalaute the influence of social networks and supports among migrants in particular (e.g., Mendoza et al., 2017). Further research is needed to understand whether group membership and which particular groups membership, might be useful for this population.

Our third hypothesis was not supported, and an unexpected and paradoxical effect emerged from the analyses. Results showed that as discrimination increased, those with higher levels of cognitive social capital reported higher levels of depression and anxiety. This finding invites several possible explanations that could be explored in future research. First, perceived discrimination may have undermined the quality of social capital (Brondolo et al., 2012). In the current sample, reported cognitive social capital may not be associated with the benefits usually enjoyed by those that possess it. This may be a function of being a member of a migrant population. For example, if migrants experienced high levels of social capital in their home countries, they still might think this is the case in their migration destination. However, this belief might not match the reality of their current relational circumstances, and therefore, reflect illusory beliefs.

A second explanation is that migrants may have a cognitive bias towards believing in just systems. For example, Priest et al. (2014) found that among those who report having direct experiences of being discriminated against, migrants who have high levels of motivated fairness (i.e., positive attitude toward a fair system) are at greater risk of experiencing depressive symptoms. This might explain our finding that those with moderate or high levels of cognitive social capital, as discrimination increases, they tend to experience high levels of CMD symptom severity.

Cognitive social capital measures attitudes toward the community they live in (e.g., trust, belongingness). Migrant domestic workers are vulnerable minorities. It is not difficult to imagine among those who intend to settle in the new environment tend to have a stronger prospect that the community they live in is fair and just. However, as this personal value conflicts with their daily experience from outgroup members, cognitive dissonance ensues, and psychological distress accumulates. It may also be possible that resources being invested in creating social capital in the host society comes at a cost of losing contact with, or reducing the salience of social capital from friends and family members in their home country. This loss of social capital and the gain of less potent capital in the host community might also be an intriguing future research direction to explore.

Finally, this finding is similar to research showing social support increased rather than decreased distress as exposure to migration stress increased in a different sample of migrant domestic workers from the Philippines (Mendoza et al., 2017). Given that this community is disadvantaged, social connection itself may act as an exposure to stress, which cannot be proactively managed due to lack of control and agency in the host society. Challenges experienced due to migration, including problems with their families left behind, the demands of their work schedule, and adjusting to their employers' requirements, is typically shared within the community. Social capital within a marginalized group may have the unintended effects of increased implicit acknowledgment of shared helplessness to confront discrimination, which exacerbates symptoms. Further investigation is needed to tease apart this novel finding.

A growing literature suggests that social resources are not universally beneficial. The match between culture, context, adversity experiences, social resource availability, and provider of social resources is key (De Silva et al., 2007; Hall et al., 2014a, Hall et al., 2016; Mendoza et al., 2017; Stafford et al., 2008; Wu et al., 2016). Social capital and social resources are generally are not a one size fits all proposition (Daoud et al., 2016). Additional work is needed with larger samples, longitudinal data, and more nuanced approaches to social network measurement in order to more fully conceptualize this complexity.

5. Limitations and conclusion

This is the first study to measure the association between discrimination, social capital, and common mental disorders among migrant domestic workers. The sample is unique and the findings add to a growing literature demonstrating the potential limits of social resources in ameliorating distress. Limitations in the study must also be noted. First, a convenience sample may not generalize to the entire population of female Filipino domestic workers in China, or globally. The snowball sampling technique may have introduced sampling bias, in which some members of the domestic worker network are less likely to be included

than others. A more precise sampling technique is required as well as a larger sample size to provide more comprehensive data to explore the study hypotheses among diverse sub-populations that may exist in the community. As with any cross-sectional study, causal relationships cannot be inferred. We cannot be certain whether CMDs influence the availability of social capital, as these associations are likely bidirectional (Hall et al., 2014c). We were also unable to assess possible changes in social capital (e.g., losses or gains) that may occur as a cost of migration. Future longitudinal studies are needed to investigate temporal associations between discrimination, social capital, and common mental disorders. Our measurement of discrimination was also limited to perceptions of unfair treatment occurring in the current context by the host culture. This does not capture the full range of possible forms of discrimination that could be experienced including unfair labor practices, and other structural forms of discrimination. Future studies are needed that quantify these forms of discrimination and how they affect wellbeing. We were not able to measure other forms of social capital that might be beneficial. For example, we were not able to measure bridging social capital to the local Chinese or other migrant populations.

The findings of this study showed that social capital did not modify the association between discrimination and depression and anxiety in the expected direction. Migrant domestic workers are a vulnerable population who is likely to experience discrimination as well as other living and working challenges and have limited access to resources. Further research is needed to investigate whether, how, and under which circumstances social resources may alleviate the effect of discrimination on migrant worker mental health.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.11.050.

References

Allen, G., Conklin, H., Kane, D.K., 2017. Racial discrimination and psychological health among Polynesians in the US. Cult. Divers. Ethn. Minor. Psychol. 23 (3), 416.

Beck, A., Crain, A.L., Solberg, L.I., Unützer, J., Glasgow, R.E., Maciosek, M.V., Whitebird, R., 2011. Severity of depression and magnitude of productivity loss. Ann. Fam. Med. 9 (4), 305–311.

Bhugra, D., 2004. Migration and mental health. Acta Psychiatr. Scand. 109 (4), 243–258.

Bogart, L.M., Wagner, G.J., Galvan, F.H., Landrine, H., Klein, D.J., Sticklor, L.A., 2011. Perceived discrimination and mental health symptoms among Black men with HIV. Cult. Divers. Ethn. Minor. Psychol. 17 (3), 295.

Bokma, W.A., Batelaan, N.M., van Balkom, A.J., Penninx, B.W., 2017. Impact of anxiety and/or depressive disorders and chronic somatic diseases on disability and work impairment. J. Psychosom. 94, 10–16.

Brondolo, E., Libretti, M., Rivera, L., Walsemann, K., 2012. Racism and social capital: the implications for social and physical well-being. J. Soc. Issues 68 (2), 358–384.

Cano, M.Á., Castro, Y., de Dios, M.A., Schwartz, S.J., Lorenzo-Blanco, E.I., Roncancio, A.M., Martinez, M.J., Sheehan, D.M., Auf, R., Piña-Watson, B., 2016. Associations of ethnic discrimination with symptoms of anxiety and depression among Hispanic emerging adults: a moderated mediation model. Anxiety Stress Coping 29 (6), 699–707.

Carballo, M., Divino, J.J., Zeric, D., 1998. Migration and health in the European Union. Trop. Med. Int. Health 3 (12), 936–944.

Chae, D.H., Lee, S., Lincoln, K.D., Ihara, E.S., 2012. Discrimination, family relationships, and major depression among Asian Americans. J. Immigr. Minor. Health 14 (3), 361–370.

Chang, M.X.-L., Jetten, J., Cruwys, T., Haslam, C., Praharso, N., 2016. The more (social group memberships), the merrier: Is this the case for Asians? Front. Psychol. 7.

Chen, D., Yang, T.-C., 2014. The pathways from perceived discrimination to self-rated health: an investigation of the roles of distrust, social capital, and health behaviors. Soc. Sci. Med. 104, 64–73.

Chen, W., Hall, B.J., Ling, L., Renzaho, A.M., 2017. Pre-migration and post-migration factors associated with mental health in humanitarian migrants in Australia and the moderation effect of post-migration stressors: findings from the first wave data of the BNLA cohort study. Lancet Psychiatry 4 (3), 218–229.

Chou, K.-L., 2012. Perceived discrimination and depression among new migrants to Hong Kong: the moderating role of social support and neighborhood collective efficacy. J. Affect. Disord. 138 (1), 63–70.

Collins, D., 2003. Pretesting survey instruments: an overview of cognitive methods. Qual. Life Res. 12 (3), 229–238.

Cuijpers, P., Smit, F., Oostenbrink, J., De Graaf, R., Ten Have, M., Beekman, A., 2007. Economic costs of minor depression: a population based study. Acta Psychiatr. Scand. 115 (3), 229–236.

Daoud, N., Haque, N., Gao, M., Nisenbaum, R., Muntaner, C., O'Campo, P., 2016. Neighborhood settings, types of social capital and depression among immigrants in Toronto. Soc. Psychiatry Psychiatr. Epidemiol. 51 (4), 529–538.

De Silva, M.J., Harpham, T., Huttly, S.R., Bartolini, R., Penny, M.E., 2005a. Understanding sources and types of social capital in Peru. Community Dev. J. 42 (1), 19–33.

De Silva, M.J., Harpham, T., Tuan, T., Bartolini, R., Penny, M.E., Huttly, S.R., 2006. Psychometric and cognitive validation of a social capital measurement tool in Peru and Vietnam. Soc. Sci. Med. 62 (4), 941–953.

De Silva, M.J., Huttly, S.R., Harpham, T., Kenward, M.G., 2007. Social capital and mental health: a comparative analysis of four low income countries. Soc. Sci. Med. 64 (1), 5–20.

De Silva, M.J., McKenzie, K., Harpham, T., Huttly, S.R., 2005b. Social capital and mental illness: a systematic review. J. Epidemiol. Community Health 59 (8), 619–627.

DSAL, 2016. Number of non-resident workers by industry and country/region of issuance of identification document. In: Labour Affairs Bureau (Ed.), Goverment of the Macao Special Administrative Region. Macao Special Administrative Region.

El-Hilu, S.M., Mousa, R., Abdulmalek, H., Kamel, N., Zohdi, M., Maher, A., Al-Aamriti, M., 1990. Psychiatric morbidity among foreign housemaids in Kuwait. Int. J. Soc. Psychiatry 36 (4), 291–299.

Ford, M.T., Cerasoli, C.P., Higgins, J.A., Decesare, A.L., 2011. Relationships between psychological, physical, and behavioural health and work performance: a review and meta-analysis. Work Stress 25 (3), 185–204.

Garabiles, M.R., Lao, C.K., Yip, P.S.Y., Chan, E.W.W., Mordeno, I., Hall, B.J. (under review). Psychometric, Psychometric Validation of PHQ-9 and GAD-7 in Filipino Migrant Domestic Workers in Macao.

Garabiles, M.R., Ofreneo, M.A.P., Hall, B.J., 2017. Towards a model of resilience for transnational families of Filipina domestic workers. PLOS one 12 (8), e0183703.

Gee, G.C., Spencer, M.S., Chen, J., Takeuchi, D., 2007. A nationwide study of discrimination and chronic health conditions among Asian Americans. Am. J. Public Health 97 (7), 1275–1282.

Gotlib, I.H., Joormann, J., 2010. Cognition and depression: current status and future directions. Annu. Rev. Clin. Psychol. 6, 285–312.

Hall, B.J., Bonanno, G.A., Bolton, P.A., Bass, J.K., 2014a. A longitudinal investigation of changes to social resources associated with psychological distress among Kurdish torture survivors living in Northern Iraq. J. Traumatic Stress 27 (4), 446–453.

Hall, B.J., Bonanno, G.A., Bolton, P.A., Bass, J.K., 2014b. A longitudinal investigation of changes to social resources associated with psychological distress among Kurdish torture survivors living in Northern Iraq. J. Trauma. Stress 27 (4), 446–453.

Hall, B.J., Shi, W., Garabiles, M.R., Chan, E.W.W., 2018. Correlates of expected eMental Health intervention uptake among Filipino domestic workers in China. Global Mental Health 5, e33.

Hall, B.J., Sou, K., Chen, W., Zhou, F., Chang, K., Latkin, C., 2016. An evaluation of the buffering effects of types and sources of support on depressive symptoms among natural disaster–exposed Chinese adults. Psychiatry 79 (4), 389–402.

Hall, B.J., Tol, W.A., Jordans, M.J., Bass, J., de Jong, J.T., 2014c. Understanding resilience in armed conflict: social resources and mental health of children in Burundi. Soc. Sci. Med. 114, 121–128.

Holroyd, E.A., Molassiotis, A., Taylor-Pilliae, R.E., 2001. Filipino domestic workers in Hong Kong: health related behaviors, health locus of control and social support. Women Health 33 (1-2), 181–205.

International Labour Office, 2013. Domestic workers across the world: global and regional statistics and the extent of legal protection. International Labour Office Geneva.

International Labour Office, 2015. ILO global estimates on migrant workers. International Labour Office Geneva.

Karlsen, S., Nazroo, J.Y., 2002. Relation between racial discrimination, social class, and health among ethnic minority groups. Am. J. Public Health 92 (4), 624–631.

Kawachi, I., Berkman, L.F., 2001. Social ties and mental health. J. Urban Health 78 (3), 458–467.

Kessler, R.C., Bromet, E.J., 2013. The epidemiology of depression across cultures. Annu. Rev. Public Health 34, 119–138.

Kessler, R.C., Greenberg, P.E., 2002. The economic burden of anxiety and stress disorders. In: Davis, K.L., Charney, D., Coyle, J.T., Nemeroff, C. (Eds.), Neuropsychopharmacology: the Fifth Generation of Progress. Lippincott, Williams & Wilkins, Philadelphia, pp. 982–992.

Kroenke, K., Spitzer, R.L., Williams, J.B., 2001. The PHQ-9: validity of a brief depression severity measure. J. Gen. Intern. Med. 16 (9), 606–613.

Lau, P.W., Cheng, J.G., Chow, D.L., Ungvari, G.S., Leung, C., 2009. Acute psychiatric disorders in foreign domestic workers in Hong Kong: a pilot study. Int. J. Soc. Psychiatry 55 (6), 569–576.

Li, G., 1985. Robust regression. In: Hoaglin, D.C., Mosteller, F., Tukey, J.W. (Eds.), Exploring Data tables, trends, and Shapes. Wiley, pp. U340.

Lindert, J., von Ehrenstein, O.S., Priebe, S., Mielck, A., Brähler, E., 2009. Depression and anxiety in labor migrants and refugees–a systematic review and meta-analysis. Soc. Sci. Med. 69 (2), 246–257.

McKenzie, K., Whitley, R., Weich, S., 2002. Social capital and mental health. Br. J. Psychiatry 181 (4), 280–283.

Mendoza, N.B., Hall, B.J., Mordeno, I.G., Latkin, C.A., 2017. Evidence of the paradoxical effect of social network support: a study among Filipino domestic workers in China. Psychiatry Res. 255, 263–271.

Mordeno, I.G., Carpio, J.G.E., Mendoza, N.B., Hall, B.J., 2018. The latent structure of major depressive symptoms and its relationship with somatic disorder symptoms among Filipino female domestic workers in China. Psychiat. Res. 270, 587–594.

Nadimpalli, S.B., James, B.D., Yu, L., Cothran, F., Barnes, L.L., 2015. The association between discrimination and depressive symptoms among older African Americans: the role of psychological and social factors. Exp. Aging Res. 41 (1), 1–24.
Nakash, O., Nagar, M., Shoshani, A., Zubida, H., Harper, R.A., 2012. The effect of acculturation and discrimination on mental health symptoms and risk behaviors among adolescent migrants in Israel. Cult. Divers. Ethn. Minor. Psychol. 18 (3), 228.
Priest, N., Perry, R., Ferdinand, A., Paradies, Y., Kelaher, M., 2014. Experiences of racism, racial/ethnic attitudes, motivated fairness and mental health outcomes among primary and secondary school students. J. Youth Adolesc. 43 (10), 1672–1687.
Spijker, J., Graaf, R.d., Bijl, R., Beekman, A., Ormel, J., Nolen, W., 2004. Functional disability and depression in the general population. Results from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). Acta Psychiatr. Scand. 110 (3), 208–214.
Spitzer, R.L., Kroenke, K., Williams, J.B., Löwe, B., 2006. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch. Intern. Med. 166 (10), 1092–1097.
Stafford, M., De Silva, M., Stansfeld, S., Marmot, M., 2008. Neighbourhood social capital and common mental disorder: testing the link in a general population sample. Health Place 14 (3), 394–405.
Szreter, S., Woolcock, M., 2004. Health by association? Social capital, social theory, and the political economy of public health. Int. J. Epidemiol. 33 (4), 650–667.
Tonsing, K.N., 2013. Predictors of psychological adaptation of South Asian immigrants in Hong Kong. Int. J. Intercult. Relat. 37 (2), 238–248.
United Nations Department of Economic and Social Affairs Population Division, 2013. The number of international migrants worldwide reaches 232 million.
van der Ham, A.J., Ujano-Batangan, M.T., Ignacio, R., Wolffers, I., 2014. Toward healthy migration: an exploratory study on the resilience of migrant domestic workers from the Philippines. Transcult. Psychiatry 51 (4), 545–568.
van der Ham, A.J., Ujano-Batangan, M.T., Ignacio, R., Wolffers, I., 2015. The dynamics of migration-related stress and coping of female domestic workers from the Philippines: an exploratory study. Community Ment. Health J. 51 (1), 14–20.
Van Ommeren, M., Sharma, B., Thapa, S., Makaju, R., Prasain, D., Bhattarai, R., de Jong, J., 1999. Preparing instruments for transcultural research: use of the translation monitoring form with Nepali-speaking Bhutanese refugees. Transcult. Psychiatry 36 (3), 285–301.
Williams, D.R., Yu, Y., Jackson, J.S., Anderson, N.B., 1997. Racial differences in physical and mental health: socio-economic status, stress and discrimination. J. Health Psychol. 2 (3), 335–351.
Wu, T.L., Hall, B.J., Canham, S.L., Lam, A.I.F., 2016. The association between social capital and depression among chinese older adults living in public housing. J. Nerv. Ment. Dis. 204 (10), 764–769.
Zahid, M.A., Fido, A., Alowaish, R., Mohsen, M.A.E.-M., Razik, M.A., 2003. Psychiatric morbidity among housemaids in Kuwait III: vulnerability factors. Int. J. Soc. Psychiatry 49 (2), 87–96.
Zimmerman, C., Kiss, L., Hossain, M., 2011. Migration and health: a framework for 21st century policy-making. PLOS Med 8 (5), e1001034.