Asia-Pacific Social Science Review

Volume 16 | Issue 2 Article 4

12-30-2016

Examining the Social Capital Measures Associated with Mental Health among the Korean Adult Population

Harris Hyun-soo Kim
Ewha Womans University, Korea, harrishkim@ewha.ac.kr

Recommended Citation
Kim, Harris Hyun-soo (2016) "Examining the Social Capital Measures Associated with Mental Health among the Korean Adult Population," *Asia-Pacific Social Science Review*: Vol. 16: Iss. 2, Article 4.
DOI: https://doi.org/10.59588/2350-8329.1083
Available at: https://animorepository.dlsu.edu.ph/apssr/vol16/iss2/4

Asia-Pacific Social Science Review (2016) 16(2): 39-47

RESEARCH ARTICLE

Examining the Social Capital Measures Associated with Mental Health among the Korean Adult Population

Harris Hyun-soo Kim
Ewha Womans University, Korea
harrishkim@ewha.ac.kr

Abstract: This study investigates some of the key social factors associated with mental health by focusing on the role of social capital defined in terms of two related yet distinct variables: general trust and social support (from kin and non-kin members). Data from the 2010 Korean General Social Survey (KGSS), which consists of a nationally representative sample, are analyzed to empirically examine the associations between the two social capital measures and self-rated mental health. Given the clustered structure of the data, multilevel or hierarchical linear models are estimated. While controlling for a host of socioeconomic and other background variables, individuals who have greater trust in generalized others (i.e., strangers) and those who receive more support from non-family members report themselves as being mentally healthier. Help from kin, on the other hand, has no significant effect. The current research suggests that there are critical social determinants of health, which are important for improving and maintaining mental well-being for the Korean adult population.

Keywords: precarious mental health, social capital, general trust, network ties, multilevel analysis, Korea

Provision of mental well-being continues to be a pressing, yet challenging, priority in the world today. According to the World Health Organization (WHO), mental "disorder" is a precursor to all kinds of physical ailments and thus requires serious attention and treatment. In recognition of the urgency of the issue, WHO (2013) proposed and instituted a comprehensive action plan designed to tackle mental health problems on a global scale. The proposed actions call for the adoption of systematic measures of prevention and social care services requiring multiparty collaboration across international borders. Despite the obvious difficulties involved, the stakes are too high not to undertake this rather monumental task.

When it comes to the status of mental health in Asian countries in particular, the situation has been precarious, at best (Maramis, Van Tuan, & Minas, 2011). Within the Asia Pacific region, South Korea especially remains an enigmatic case. Accompanied by the rapid economic development, the country has achieved an impressive expansion in health care coverage during the last several decades (Organisation for Economic Co-operation and Development [OECD], 2012). Despite the availability and delivery of relatively high quality health care services, however, Koreans across different socioeconomic strata and demographic segments continue to suffer from mild to severe forms of mental illness

(Park, Heo, Subraimanian, Kawachi, & Oh, 2012). The gravity of the situation is underscored by the fact that Korea for the last 10 years has led all OECD nations in terms of the highest suicide rate, raising major concern among policy makers and researchers alike (OECD, 2012).

What are some of the key factors associated with precarious mental health conditions among the Korean population? This inquiry has profound implications for public health improvement in Korea. The primary objective of this study is to address this pertinent question. More specifically, the focus will be on the social determinants of mental health as defined by the concept of "social capital," which has gained increasing popularity and usage in interdisciplinary research (Coleman, 1988; Portes, 1998).

Public health researchers have long recognized that social connections, interpersonal ties, social support, and so forth play a critical role in affecting psychological and emotional well-being of individuals (Berkman, Glass, Brissette, & Seeman, 2000; Smith & Christakis, 2008; Thoits, 2011). The umbrella concept that has emerged in recent years to describe this multifaceted role is social capital (Webber, Huxley, & Harris, 2011; Story, 2014; Giordano, Bjork, & Lindstrom, 2012). According to one oft-cited definition, social capital is "the capacity of individuals to command scarce resources by virtue of their membership in networks or broader social structure" (Portes, 1998, p. 7. This concept has frequently been measured in terms of trust and access to social support. Prior research demonstrates that trusting in generalized others and receiving (emotional/material) assistance from known others significantly and positively influence the status of health, both physical and mental (Cornwell & Waite, 2009).

Even a quick glance at the extant scholarship suggests, however, that most studies are based on data from developed (North American and European) countries (Habibov & Afandi, 2011). Consequently, only limited scholarly attention has been given to how and to what extent social capital measures (e.g., trust and support) are related to the mental health outcome in non-Western settings. In fact, this issue "is yet a matter of debate" (Kumar, Calvo, Avendano, Sivaramakrishnan, & Berkman, 2012, p. 697. This study contributes to the social epidemiology literature by shifting the analytic focus to a representative sample of Korean adults. Also, as has been pointed out, health conditions are shaped by individual characteristics as well as broader contextual factors (Verhaeghe & Tampubuolon, 2012; Moore et al., 2011). In recognition of this observation and consistent with prior studies, the current research takes the methodological approach of estimating multilevel or hierarchical models.

In sum, this study hypothesizes that, while controlling for other factors at both individual (respondent) and contextual (regional) levels, having higher generalized trust and greater access to social support is associated with better mental health. Understanding the complex ways in which these variables are interrelated is a key step toward ultimately providing better public health outcomes for the empirical sample examined herein and beyond.

Methods

Data Description

Data came from the East Asian Social Survey (EASS) 2010 Health Module. It is a cross-national dataset containing large nationally representative samples from China, Japan, Korea, and Taiwan. This study uses the Korean subsample, which is based on the Korean General Social Survey (KGSS). The KGSS was conducted by the Survey Research Center headquartered at Sungkyunkwan University in Seoul. The fieldwork lasted for about two months from June 28, 2010 to August 31, 2010. The study population consisted of adult citizens aged 18 and over who lived in households at the time of the survey. Multi-stage area probability sampling was used. Face-to-face interviews were conducted with 1,576 survey participants throughout the country (with the response rate of 63%). This is one of the most comprehensive and up-to-date general social surveys available on the Korean population, with specially added information on health related items. More details of the dataset can be found at http://kgss.skku.edu. After deleting cases with missing values, the final sample contains 1,347 individuals (Level 1 N) nested in 13 different regional units (Level 2 N) located throughout the

country. Sampling weights were applied to correct for the probability of inclusion in the survey.

Measures

Dependent and independent variables. The dependent variable (Mental Health) is based on three survey items that tap the respondents' state of mental well-being ("Have you felt calm and peaceful?"; "Did you have a lot of energy?"; "Have you felt downhearted and depressed?"). Each item was originally coded on a 5-point scale (1 = "All of the time," 3 = "Some of the time," 5 = "None of the time"). The first two questions were reverse coded. The answers were then aggregated and averaged (Cronbach's alpha = .73), which range from 1 to 5 with the higher value indicating better mental health. The main predictors are General Trust, Kin Help, and Non-kin Help. The first variable gauges the level of trust ("Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?") and the last two variables measure the degree of assistance (i.e., social support) received from family and non-family members, respectively. The trust variable is reverse-coded so that a higher score indicates greater trust (e.g., 4 = "People can almost always be trusted," 1 = "You almost always can't be too careful in dealing with people"). Social support is measured based on a series of questions concerning whether the respondent has a kin or a non-kin member who either listened to his/her problems and concerns, provided financial support, or took care of household chores. For each social support variable, the answers were recoded (e.g., 3 = "Very often and often" 2 = "Sometimes," 1 = "seldom," 0 = "not at all"), after which they were summed across the three survey items and averaged. The internal consistency level for Kin Help (alpha = .68) was higher than that for Non-kin Help (alpha = .58).

Control variables. A number of controls were included in the analysis at individual and contextual levels that may correlate with the outcome measure. At the individual level, several sociodemographic factors were taken into account, namely marital status (1 = married), gender (1 = female), and age (in years). Religious background is also controlled by creating a list of dummy variables: Catholic, Protestant, and Buddhist. The remaining groups (including atheist) make up the reference category. Educational attainment (in number of years) and (natural log of) household income are also included as controls. Two additional variables are considered, which measure self-reported physical and emotional states. The variable Pessimism is based on the following two items: "The future seems to me to be hopeless, and I can't believe that things are changing for the better" and "I feel that it is impossible for me to reach the goals that I would like to strive for." The combined answers, coded on a 5-point scale, (5 = "Strongly agree," 3 = "Neither agree nor disagree," 1 = "Strongly disagree") range from 2 to 10, where a higher score means greater pessimism (alpha = .79). Lastly, the respondents were asked whether they suffered from a chronic illness (hypertension, diabetes, heart disease, respiratory problem, others). A value of 1 is assigned if answered "yes" to any one of them, and 0 otherwise.

At the contextual or regional level, four factors are considered: general trust, age, household income, and neighborhood quality. The first three variables are created by taking the average value across the contextual or regional unit, a standard practice in public health research. Including the general trust measure at the contextual level is especially relevant since whether social capital is an individual attribute or a collective good has been a matter of some controversy (Poortinga, 2006). The last one, Neighborhood Quality, is based on a number of questions that gauge residential characteristics, specifically 1) suitability for physical exercise; 2) availability of fruits and/or vegetables; 3) adequate public facilities; 4) physical safety; 5) mutual concern for one another among neighbors; and 6) willingness on the part of neighbors to provide assistance to others. The original answers for the six items were reverse-coded on a 5-point scale (5 = "Strongly agree," 3 = "Neither agree nor disagree," 1 = "Strongly disagree"), aggregated, and then averaged across regional clusters (alpha = .63). Descriptive statistics for all the variables used are summarized in Table 1.

Table 1 *Unweighted Descriptive Statistics for the Variables Used*

Variables	*Mean*	*S.D.*	*Min.*	*Max.*
Level-1 (N=1,341)				
Mental Health	3.50	.93	1	5
Married	.66	.48	0	1
Age	45.22	16.04	18	90
Female	.52	.50	0	1
Catholic	.08	.27	0	1
Protestant	.24	.43	0	1
Buddhist	.24	.42	0	1
Chronic Illness	.30	.46	0	1
Pessimism	4.35	2.25	2	10
Education	11.96	4.24	0	21
Family Income (ln)	5.45	1.26	0	9.21
General Trust	2.32	.81	1	4
Kin Help	.64	.96	0	3
Non-kin Help	.38	.70	0	3
Level-2 (N=13)				
General Trust	2.32	.21	2.02	2.94
Age	45.16	2.50	41.82	48.71
Family Income (ln)	5.41	.26	4.97	5.77
Neighborhood Quality	3.45	.12	3.26	3.64

Data source: KGSS (2010)

Analytic Strategy

Like most large-scale surveys, the KGSS contains data that are hierarchical. That is, the individual respondents are nested in a higher-level contextual—regional, unit. There are 13 such regional units in the dataset, representing different parts of the country. Given the nested structure of the data, estimating standard Ordinary Least Squares (OLS) regression models can pose a methodological problem. Specifically, due to the non-constant variance across the contextual units, it can lead to underestimation of standard errors (Raudenbush & Bryk, 2006; Snijders & Bosker, 1999). The recommended strategy is to run multilevel or hierarchical linear model (HLM), which provides more reliable and unbiased parameter estimates. It also allows for a simultaneous test of the relationship between the outcome (mental health) and the independent variables (generalized trust and social support) at both individual (Level 1) and contextual (Level 2) levels. The estimated HLM takes the following expression:

$$H_{ij} = \beta_0 + \beta_1 \boldsymbol{S}_{ij} + \beta_2 \boldsymbol{S}_j + \beta_3 \boldsymbol{X}_{ij} + {}_j + \varepsilon_{ij} \quad (1)$$

H_{ij} is the subjective health outcome for respondent i (Level 1) in region j (Level 2), $\boldsymbol{S}_{ij}$ is the set of main independent variables measured at Level 1, $\boldsymbol{S}_j$ are the Level 2 variables, and $\boldsymbol{X}_{ij}$ is a vector of control variables. b's are fixed parameters to be estimated, ${}_j$ is the region-specific random effect, and ε_{ij} is the component of the error term. To address the problem of collinearity, all non-constant Level 1 variables are

centered at the group mean and Level 2 variables are grand-mean centered. Statistical analyses are carried out using HLM 7 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). Since the KGSS (2010) dataset has a relatively small number of regional clusters, this may call into question the accuracy of Level 2 random variance components which rely on the degrees of freedom at the higher-level unit (Austin, 2010; Moineddin, Matheson, & Glazer, 2007). To check the robustness of findings from HLM, fixed effects modeling has been recommended as a viable alternative approach (Huang, 2016). Empirical results reported herein are thus from running both multilevel and cluster-level fixed effects models.

Table 2 *HLM Estimating the Associations Between Social Capital and Mental Health (KGSS, 2010)*

	Model 1 Coefficient (SE)	Model 2 Coefficient (SE)	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)
Constant	3.49 (.03)***	3.67 (.06)***	3.67 (.05)***	3.68 (.05)***
Level-1(N =1,341)				
Married		.04 (.05)	.05 (.05)	.04 (.05)
Age		**.01 (.00)*****	**.01 (.00)*****	**.01 (.00)*****
Female		**-.20 (.05)*****	**-.19 (.05)*****	**-.19 (.05)*****
Catholic		.04 (.09)	.03 (.09)	.02 (.09)
Protestant		.02 (.06)	.01 (.06)	.01 (.06)
Buddhist		-.06 (.06)	-.07 (.06)	-.07 (.06)
Chronic Illness		**-.31 (.05)*****	**-.31 (.05)*****	**-.30 (.05)*****
Pessimism		**-.16 (.01)*****	**-.15 (.01)*****	**-.15 (.01)*****
Education		.01 (.01)	.01 (.01)	.01 (.01)
Family Income (ln)		**.10 (.02)*****	**.09 (.02)*****	**.09 (.02)*****
Kin Help			-.03 (.03)	-.03 (.03)
Non-kin Help			**.08 (.04)***	**.08 (.04)***
General Trust			**.09 (.03)****	**.09 (.03)****
Level-2 (N = 13)				
General Trust				.23 (.25)
Age				-.02 (.02)
Family Income (ln)				-.05 (.22)
Neighborhood Quality				.13 (.27)
Random Parameters				
Variance component (L-1)	.86	.66	.65	.66
Variance component (L-2)	.00	.00	.00	.00
Deviance	3605.21	3258.65	3242.40	3237.57

Note: Significant coefficients are in bold print. Robust standard errors are in parentheses.

**P < 0.05; **P < 0.01; ***P < 0.001*

Results

In the KGSS sample (N = 1,347), the average age of respondents is around 45. A little over half (52%) are women, and about 66% are married. The mean year of education is slightly below 12. About a quarter of the survey participants stated that they are Buddhist, another fourth are self-described Protestant, and Catholics make up 8% of the sample. Concerning mental well-being, on a 5-point scale, where 5 indicates being "very healthy," the average value is 3.5. With respect to general trust, the average score is 2.32. The mean for Kin Help is .64 and it is .38 for Non-kin Help, indicating that, perhaps not surprisingly, the respondents received more social support from family members. Table 2 contains the parameter estimates from running multilevel models. Table 3 summarizes results from the fixed effects models.

Table 3 *Results From Running Fixed Effects Model*

Married	.038 (.053)
Age	.014 (.002)***
Female	-.188 (.047)***
Catholic	.025 (.087)
Protestant	.016 (.058)
Buddhist	-.049 (.060)
Chronic illness	-.302 (.055)***
Pessimistic	-.155 (.012)***
Education	.010 (.008)
Family Income (ln)	.096 (.022)***
General Trust	.088 (.028)**
Kin Help	-.030 (.026)
Non-kin Help	.076 (.036)*
	+ Region-FEs
Constant	2.820 (.211) ***
N	1,347
R^2	.493
Adjusted R^2	.229

$^{*}P < .05$; $^{**}P < .01$; $^{***}P < .001$

FEs = fixed effects (dummy variables for N-1 regions)

Findings from the two complementary analytical approaches are virtually identical. For simplicity's sake, the discussion below is limited to results from hierarchical linear modeling (Table 2). Model 1 is the null model without any of the covariates. Model 2 consists of control variables only. A number of coefficients are statistically significant. Ceteris paribus, older people are mentally healthier ($p < .001$). Women, on the other hand, are less likely to be so ($p < .001$). These results confirm as well as diverge from prior research, where age and (female) gender status have been found to be both negatively associated with mental health in other contexts (Tomita & Burns, 2013 Song & Lin, 2009). Interestingly, among the Korean population, aging does not adversely affect the subjectively perceived mental health status. Not surprisingly, having a chronic illness ($p < .001$) and being pessimistic ($p < .001$) are both negatively related to mental well-being. Lastly, as expected, higher household income is associated with better health ($p < .001$), a finding that corroborates the mainstream view in cross-national research. While holding constant multiple control variables, general trust and social support variables are introduced in Model 3. Inclusion of these covariates, the main predictors, does not alter the magnitude or strength of the aforementioned variables. With respect to the main hypothesis concerning the role of social capital, two statistically significant findings emerge. People who place greater trust in others are mentally healthier ($p < .01$), as are those who receive more help from non-kin members ($p < .05$), net of controls. Social support from family members, however, has no effect. Model 4, the full model, incorporates regional-level measures. Contrary to expectations, none of them reaches the conventional level of significance, while the associations between trust and non-kin help and mental health continue to hold. In models not shown, cross-level interaction effects were tested but found not to be significant.

Discussion

The main finding of this study is that, over and above socioeconomic, demographic, and other

background factors measured at individual and contextual levels, mental health is significantly associated with social factors: specifically, the greater the general trust and non kin-based social support, the better the health outcome. There is ample evidence in the social epidemiology literature showing that interpersonal trust, network ties, and social support can not only maintain but also improve physical and mental health (Smith & Christakis, 2008; Thoits, 2011; Uchino, 2004; Umberson & Montez, 2010). Consistent with earlier research, (Fujiwara & Kawachi, 2008; Subramanian, Kim, & Kawachi, 2002; Mansyur, Amick, Harrist, & Franzini, 2008; Hooghe & Vanhoutte, 2011; Poortinga, 2006) the current study indicates that people who are more willing to trust others and thus more sociable are healthier mentally. Trust matters, however, only as an individual attribute. As a collective-level phenomenon, it is not found to be significant. That is, as multilevel analysis indicates, living in an environment characterized by high trust does not translate into mental well-being, which diverges from some of the other findings. Also in contrast to studies that have found significant contextual effects (Bassett & Moore, 2014; Maimon, Browning, & Brooks-Gun, 2010; Tomita & Burns, 2013), neighborhood quality is not shown to have any health benefits.

In previous studies, a conceptual distinction is often made between "primary" and "secondary" groups (Thoits, 2011). The former refers to close and intimate relationships consisting of friends and family members. The latter is typically composed of acquaintances or distant contacts. According to the statistical results reported above, further categorization may be needed within each of the two social groups to better understand the association between social support and health. Clearly, the issue is not whether the person receives support but *from whom* it comes. Receiving emotional or material assistance from kin has no positive health effect. What *is* significant, on the other hand, is having non-family members listen to personal problems, offer financial assistance, and/or lend a helping hand with performing domestic chores. In other words, even among primary ties (friends and family) there is an important distinction that needs to be made and accounted for.

Public health research has increasingly emphasized social integration as a key determinant of health. Individuals who are better connected, that is, socially integrated, experience better health outcomes (Smith & Christakis, 2008; Thoits, 2011). The current research based on population-level data from a non-Western setting largely corroborates the mainstream argument that being connected does matter. In addition, it sheds light on the different roles that family and non-family members play in influencing subjective assessment of mental health.

Due to the cross-sectional nature of the dataset, causality cannot be inferred from the empirical findings discussed earlier, especially concerning the association between trust and health. While it is plausible that more trusting individuals are mentally healthier, the reverse can also be true: healthier persons may be more trusting. Unfortunately, due to data limitation, this reverse causation cannot be ruled out. Also, concerning social support, the KGSS does not contain detailed information on network size or network structure, that is, the interconnectedness among network members. Future studies based on longitudinal data with better measures are needed to establish better causal (temporal) order and hence offer more valid evidence. Despite the limitations, the analysis of a large probability sample allows for useful generalizations across an entire population. The conceptual distinction discussed above between kin-based and non kin-based social support also gives a more nuanced look at the linkage between social capital and mental health.

Conclusion

According to a report released by the Ministry of Health and Welfare of Korea (2012) , one in six Koreans, or close to six million people, have experienced some type of psychiatric illness. The medical problem is exacerbated by the fact that out of those, less than 16% sought professional help. Being mentally unhealthy can cause serious physical problems or even lead to self-destructive behavior such as suicide. As mentioned previously,

Korea leads OECD nations in terms of the national suicide rate. Understanding the factors associated with mental health thus has grave implications for the general welfare of Korean population. This study seeks to contribute to that endeavor by focusing on the role of social capital, and, in doing so, adds to the burgeoning interdisciplinary literature on this topic. The health effects of social capital have received increasing attention over the years among both academics and policy makers. The creation of the WHO Commission on Social Determinants of Health (2008) attests to this growing popularity. More empirical research is needed to further demonstrate how and under what conditions interpersonal trust and network ties can, or fail to, provide health benefits.

Acknowledgements

This research was supported by the Ministry of Education of Korea and the National Research Foundation of Korea (NRF-2015S1A3A2046566).

References

Austin, P. C. (2010). Estimating multilevel logistic regression models when the number of clusters is low: a comparison of different statistical software procedures. *International Journal of Biostatistics, 6*(1), Article 16.

Bassett, E., & Moore, S. (2014). Neighborhood disadvantage, network capital and restless sleep: Is the association moderated by gender in urban-dwelling adults? *Social Science & Medicine, 108*,185-193.

Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine, 51*, 843-857.

Bourdieu P. (1986). *The Form of capital*. In JG Richardson (Ed.) *Handbook of Theory and Research for the Sociology of Education*. New York: Greenwood.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, 95-120.

Cornwell, E. Y., & Waite, L. J. (2009). Social disconnectedness, perceived isolation, and health among older adults. *Journal of Health and Social Behavior, 50*, 31-48.

Fujiwara, T., & Kawachi, I. (2008). A prospective study of individual-level social capital and major depression in the United States. *Journal of Epidemiology & Community Health, 62*, 627-633.

Giordano, G. N., Bjork, J., & Lindstrom, M. (2012). Social capital and self-rated health – A study of temporal (causal) relationships. *Social Science & Medicine, 75*, 340-348.

Habibov, N., & Afandi, E. (2011). Self-rated health and social capital in transitional countries: Multilevel analysis of comparative surveys in Armenia, Azerbaijan, and Georgia. *Social Science & Medicine*, *72*, 1193-1204.

Hooghe, M., & Vanhoutte, B. (2011). Subjective well-being and social capital in Belgian communities: The impact of community characteristics on subjective well-being indicators in Belgium. *Social Indicators Research, 100*, 17-36.

Huang, F. L. (2016) Alternative to multilevel modeling for the analysis of clustered data. *Journal of Experimental Education, 84*(1), 175-196.

KGSS (Korean General Social Survey) 2012. ICPSR35335-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

Kumar, S., Calvo, R., Avendano, M., Sivaramakrishnan, K., & Berkman, L. F. (2012). Social support, volunteering and health around the world: Cross-national evidence from 139 countries. *Social Science & Medicine, 74*, 696–706.

Maimon, D., Browning, C. R., & Brooks-Gun, J. (2010). Collective efficacy, family attachment, and urban adolescent suicide attempts. *Journal of Health and Social Behavior, 51*, 307-324.

Mansyur, C., Amick, B., Harrist, R., & Franzini, L. (2008). Social capital, income inequality, and self-rated health in 45 countries. *Social Science & Medicine, 66*, 43-56.

Maramis, A., Van Tuan, N., & Minas, H. (2011). Mental health in Southeast Asia. *Lancet, 377*, 700-702.

Ministry of Health and Welfare of Korea, Korea Centers for Disease Control and Prevention. *2011 Korea Health Statistics*. Seoul: Ministry of Health and Welfare of Korea, 2012.

Moineddin, R., Matheson, F. I., & Glazier, R. H. (2007). A simulation study of sample size in multilevel regression models. *BMC Medical Research Methodology, 7*, article 34.

Moore, S., Bockenholt, U., Daniel, M., Frohlich, K., Kestens, Y., & Richard, L. (2011). Social capital and core network ties: a validation study of individual-level social capital measures and their association with extra- and intra-neighborhood ties, and self-rated health *Health & Place, 17(2)*, 536-544.

OECD. (2014, November 11). *Health Statistics 2013*. http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT.

Organisation for Economic Co-operation and Development [OECD]. (2012). *OECD reviews of health care quality: Korea 2012: Raising standards*. Published online March 21, 2012. Retrieved from www.oecd.org/publications/oecd-reviews-of-health-care-quality-korea-9789264173446-en.htm OECD Publishing.

Park, H. Y., Heo, J., Subraimanian, S. V., Kawachi, I,. & Oh, J. (2012). Socioeconomic inequalities in adolescent depression in South Korea: A multilevel analysis. *PloS One*, *7*(10), e47025.

Poortinga, W. (2006). Social capital: An individual or collective resource for health? *Social Science & Medicine, 62*, 292-302.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology, 24*, 1-24.

Raudenbush, S. W., Bryk, A. S., Cheong, Y.F., Congdon, R., & du Toit, M. (2011). *HLM 7: Hierarchical linear and nonlinear modeling.* Lincolnwood, IL: Scientific Software International.

Raudenbush, S. W., & Bryk, A. S. (2006). *Hierarchical linear models: Applications and data analysismMethods*. Thousand Oaks, CA: Sage Publications.

Smith, K. P., & Christakis, N. A. (2008). Social networks and health. *Annual Review of Sociology, 34*, 405-429.

Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London: Sage.

Song, L., & Lin, N. (2009). Social capital and health inequality: Evidence from Taiwan. *Journal of Health and Social Behavior, 59*, 149-163.

Story, W. T. (2014). Social capital and the utilization of maternal and child health services in India: A multilevel analysis. *Health & Place, 28*, 73-84.

Subramanian, S. V., & Kim, D. J., & Kawachi, I. (2002). Social trust and self-rated health in US communities: A multilevel analysis. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, *79*, S21-S34.

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior, 52*, 145-161.

Tomita, A., & Burns, J. K. (2013). A multilevel analysis of association between neighborhood social capital and depression: Evidence from the first South African National Income Dynamics Study. *Journal of Affective Disorders, 144*, 101-105.

Uchino, B. N. (2004). *Social support and physical health: Understanding the health consequences of relationships*. New Haven, CT: Yale University Press.

Umberson, D., & Montez, J. K. (2010). Social relationships and health a flashpoint for health policy. *Journal of Health and Social Behavior*, *51*(1), S54-66.

Verhaeghe, P., & Tampubuolon, G. (2012). Individual social capital, neighborhood deprivation, and self-rated health in England. *Social Science & Medicine, 75*, 349-357.

Webber, M., Huxley, P., & Harris, T. (2011). Social capital and the course of depression: Six-month prospective cohort study. *Journal of Affective Disorder, 129*, 149-157.

World Health Organization [WHO]. (2013), *Mental health action plan 2013-2020*.. Retrieved from http://www.who.int/mental_health/publications/action_plan/en/