Predictors of Depressive Symptoms Based on the Human Capital Model Approach: Findings From the Indonesia Family Life Survey

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INTRODUCTION

Depression is the leading factor of disability and the overall global burden of diseases. The human capital model provides an appropriate conceptual model for managing human health. This study aimed to determine the association between human capital (including social, emotional, physical, financial, and intellectual capital) and depressive symptoms among productive age groups in Indonesia. A cross-sectional study was conducted by analyzing data of 9,858 respondents aged 15-59 years that were obtained from the Indonesia Family Life Survey 5 (IFLS 5). Multivariate logistic regression was used to assess the association between human capital components and depressive symptoms. Among respondents, 23.65% had higher depressive symptoms. Social trust and social networks (part of social capital) were significantly related to depressive symptoms. Self-reported satisfaction (part of emotional capital) were also related to depressive symptoms, as well as self-rated health, sleep quality, a number of chronic disease, body mass index (BMI), and physical functioning (part of physical capital). Log income (part of financial capital) and education level (part of intellectual capital) were related to depressive symptoms after controlling for other variables. Of all the components of human capital, physical capital has the most attributes associated with the risk of depressive symptoms. Therefore, depression prevention programs can be prioritized on attributes related to physical capital.
As we know, there are effective treatments for depressive disorders, but 76-85% of people who experience depression disorders do not get effective treatment, especially in middle-low income countries [2]. In Indonesia, only 9% of depressed sufferers get medical treatment whereas there are around 3.7% of the population experiencing depressive disorders [3,4]. A depressive disorder is one of the five main causes of years lived with disability (YLD) in Indonesia with a percentage of 6.6% [3].

The human capital paradigm provides an appropriate conceptual model for managing human health. This human capital model assumes that humans are a form of capital like machines, technology, land, money, and materials that can be used to invest all their abilities and what they have to produce extraordinary performance [5]. Human capital can be valued at various levels and includes social capital, emotional capital, physical capital, financial capital, and intellectual capital [6]. Optimal performance can be achieved if all components in human capital are optimized, including achieving the highest degree of health [7]. Prior studies found an association of several components of human capital with depression. One measure that has been extensively studied in relation to mental health such as depression is social capital. Social capital dimensions (trust, social networks, and reciprocity) are significantly associated with depressive symptoms [8,9]. A greater social capital is associated with less depressive symptoms [9]. A study in China also found that financial capital can predict increased depressive symptoms [10]. Self-efficacy, hope, resilience, and optimism, which are components of emotional capital, are considered as positive assets to prevent depression [11].

This study applies a human capital theory framework [6,10] to understand the social determinants of depressive symptoms in Indonesia. The study about the effect of human capital on depression is still growing. It is rarely carried out in developing countries, including Indonesia. Notably, it places a test of the effects of human capital in an integrative framework that investigates how components of human capital embedded in families and communities influence the symptoms of depression in Indonesia. The Indonesian Family Life Survey 5 (IFLS 5) data will be used to explain the purpose of this study. This study aims to determine the association between human capital factors and depressive symptoms among age productive groups in Indonesia.

MATERIALS AND METHODS

Design Study

This cross-sectional study used IFLS 5 data that were obtained from the RAND Corporation. The IFLS is a longitudinal and sustainable survey of socio-economic and health status. The survey was conducted at the end of 2014 and completed in 2015 [12].

Population and Sampling

The sample of IFLS is representative of about 83% of the Indonesian population and contains over 30,000 individuals living in 13 of the 27 provinces in the country [13].

The IFLS 5 interviewed 50,148 individuals face to face. Enumeration areas (EA) were randomly selected from the sample framework used in SUSENAS 1993 (https://www.rand.org/well-being/social-and-behavioral-policy/data/bps/susenas/1993.html). The sample of this study was 9,858 individuals aged 15-59 years who were successfully interviewed.

Variables

Status of depressive symptoms was the dependent variable. The independent variable of this study was human capital. Human capital consisted of social capital, emotional capital, physical capital, financial capital, and intellectual capital. The components of social capital consisted of social trust, cooperativeness, and social networks. Emotional capital was described by perception of life satisfaction. Physical capital was explained by self-rated health, sleep quality, the number of chronic diseases, BMI, physical function, and smoking status. Financial capital was measured by income and occupation variables. Intellectual capital was defined by cognitive level and education level variables [6]. The demographic variables included age, sex, and marital status.

DATA MANAGEMENT

Measurement of Depressive Symptoms

Depressive symptoms were measured using a 10-item Center for Epidemiologic Studies Depression Scale (CES-D). Depressive symptoms were categorized into higher and lower depressive symptoms. Respondents were asked to state how they felt in the past week. The response options were rarely or none, some days, occasionally, and most of the time. Respondents who had score of 10 or more would be considered to have higher depressive symptoms and respondents who had score less than 10 would be considered to have lower depressive symptoms [14,15].

Measurement of Social Capital

Social trust was measured by asking 10 questions of
respondents about their trust in neighbors. Four responses could be chosen with a score of 1 to 4. Social trust was categorized into poor and good social trust. Individuals with a score ≥ 24 were considered to have poor social trust and < 24 were considered to have good social trust [12].

Cooperativeness was assessed by how willing respondents were to help people in their village and was categorized into poor and high cooperation. Respondents who answered strongly agree and agree were categorized into high cooperation. Respondents who answered disagree and strongly disagree were categorized into poor cooperation [12].

Social networks were calculated as number of the participation in community activities during the last year. Community activities included community meetings, cooperatives, voluntary labor, village/neighborhood improvement programs, youth group activities, religious activities, and other similar activities [12,16].

**Measurements of Emotional Capital**

Self-rated life satisfaction was measured by asking how respondents satisfied with their life [17] and was categorized into satisfied and unsatisfied. Respondents were determined to be satisfied if they answered completely satisfied and very satisfied. Respondents were classified as unsatisfied if they answered somewhat satisfied, not very satisfied, and not at all satisfied.

**Measurement of Physical Capital**

Self-rated health was measured by asking respondents about their current health condition in general [17] and was categorized into poor and good self-rated health. Respondents were considered to have good health if they answered sometimes healthy and very healthy. Poor health category was defined when they responded sometimes unhealthy and very unhealthy.

Sleep quality was measured by asking 10 questions about how respondents sleep in the past week. Each response had score 1 to 5 [12]. Sleep quality was categorized into poor and good sleep quality. Individuals with a score ≥ 20 were considered to have poor sleep quality and a score of < 20 were considered to have good sleep quality.

The number of chronic diseases were measured by asking the respondents whether the doctor/paramedic/nurse/midwife has said that the respondent has a condition/disease from a list of diseases [12].

Body mass index (BMI) was calculated by dividing weight (in kg) by height (in m²). BMI was used to determine whether respondents were in a healthy weight range for their height. We categorized BMI into four groups using the cutoff for Asian and Pacific populations, namely underweight (< 18.5 kg/m²), normal (18.5-22.9 kg/m²), overweight (23-24.9 kg/m²), and obesity (≥ 25 kg/m²) [18,19].

Physical functioning was measured using a statement of physical functioning which consisted of 11 statement items. Each statement item had score 1 to 3. Physical functioning was categorized into poor and good physical function [15]. Poor physical function was determined if respondents had a score of physical functioning ≥ 13 and good physical function if respondents had a score of physical functioning < 13.

Smoking status was measured by asking whether respondents have ever had chewed tobacco, smoked tobacco (used pipes or self-rolled), or smoked cigarettes/cigars and whether the habit continues today. Smoking status was categorized into yes and no. Respondents who answered “it was still going on,” would be coded “Yes,” and respondents answered “no or had stopped,” would be coded “No” [17].

**Measurement of Financial Capital**

Occupation was measured by asking “What was your primary activity during the past week?” Occupation was categorized as currently working (working/helping to earn income) or not (job searching, attending school, housekeeping, retired, sick/disabled, other). Family income was measured by a log of family income over the past year in rupiah [15].

**Measurement of Intellectual Capital**

The level of education consisted of lower education (no schooling, no primary school, primary school), middle-level education (junior and senior high school graduate), and higher education (college graduate). The cognitive level score was calculated by totaling attention and orientation scores. Respondents had a good cognitive level if they had score ≥ 6. Respondents had a poor cognitive level if they had a score < 6.

**Measurement of Covariates Variables**

Age was defined as the respondent’s last birthday from the time of the study. The age variable was categorized into 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59 years [20]. Sex included males and females. Marriage status consisted of married and not married (not married, separated, widowed, and living together).

**Statistical Analysis**

The data were analyzed using univariate and multivariate techniques. Univariate analysis was performed to determine the frequency and distribution of the variables.
Table 1. Characteristics of Respondents and Distributions of Depressive Symptoms, Social Capital, Emotional Capital, Physical Capital, Financial Capital, and Intellectual Capital

| No | Variables                              | n=9,858 | %    | Mean  | SD    |
|----|----------------------------------------|---------|------|-------|-------|
| 1  | Age (years)                            |         |      |       |       |
|    | 15-19                                  | 159     | 1.61 | 37.48 | 9.47  |
|    | 20-24                                  | 570     | 5.78 |       |       |
|    | 25-29                                  | 1,327   | 13.46|       |       |
|    | 30-34                                  | 2,084   | 21.14|       |       |
|    | 35-39                                  | 1,871   | 18.98|       |       |
|    | 40-44                                  | 1,461   | 14.82|       |       |
|    | 45-49                                  | 1,106   | 11.22|       |       |
|    | 50-54                                  | 784     | 7.95 |       |       |
|    | 55-59                                  | 496     | 5.03 |       |       |
| 2  | Sex                                    |         |      |       |       |
|    | Female                                 | 949     | 9.63 |       |       |
|    | Male                                   | 8,909   | 90.37|       |       |
| 3  | Married                                |         |      |       |       |
|    | Married                                | 6,122   | 62.10|       |       |
|    | Otherwise                              | 3,736   | 37.90|       |       |
| 4  | Depressive symptoms                    |         |      |       |       |
|    | Lower                                  | 7,527   | 76.35|       |       |
|    | Higher                                 | 2,331   | 23.65|       |       |
| 5  | Social trust                           |         |      |       |       |
|    | Good                                   | 3,954   | 40.11|       |       |
|    | Poor                                   | 5,904   | 59.89|       |       |
| 6  | Cooperativeness                        |         |      |       |       |
|    | Yes                                    | 9,799   | 99.40|       |       |
|    | No                                     | 59      | 0.60 |       |       |
| 7  | Social network                         |         |      | 2.33  | 1.98  |
| 8  | Perception of life satisfied           |         |      |       |       |
|    | Satisfied                              | 4,121   | 41.80|       |       |
|    | Not satisfied                          | 5,737   | 58.20|       |       |
| 9  | Perception of health status            |         |      |       |       |
|    | Healthy                                | 8,002   | 81.17|       |       |
|    | Unhealthy                              | 1,856   | 18.83|       |       |
| 10 | Quality of sleep                       |         |      |       |       |
|    | Good                                   | 4,657   | 47.24|       |       |
|    | Poor                                   | 5,201   | 52.76|       |       |
| 11 | Number of chronic conditions           |         |      | 0.46  | 0.77  |
| 12 | BMI                                    |         |      |       |       |
|    | Malnutrition                           | 797     | 8.08 |       |       |
|    | Normal                                 | 4,002   | 40.60|       |       |
|    | Overweight                             | 1,659   | 16.83|       |       |
|    | Obesity                                | 3,400   | 34.49|       |       |
| 13 | Physical functioning                   |         |      |       |       |
|    | Good                                   | 4,362   | 44.25|       |       |
|    | Poor                                   | 5,496   | 55.75|       |       |
| 14 | Status of smoking                      |         |      |       |       |
|    | No                                     | 5,520   | 56.00|       |       |
|    | Yes                                    | 4,338   | 44.00|       |       |

Financial Capital
odds ratio association between components of human capital and depressive symptoms are noted in Table 2.

Based on social capital factors, respondents who had poor social trust had 26% (AOR=1.26; 95% CI 1.13-1.40, p<0.001) higher odds of experiencing depressive symptoms compared to respondents who had good social trust. Respondents who had more social networks had 3% (AOR=1.03; 95% CI=1.004-1.06, p=0.024) higher odds to experience depressive symptoms compared to respondents who had fewer social networks. Based on emotional capital factors, respondents who felt unsatisfied had 39% (AOR=1.39; 95% CI=1.25-1.55, p<0.001) higher odds to experience depressive symptoms compared to respondents who felt satisfied (Table 3).

Based on physical capital factors, respondents who had an unhealthy status had 54% (AOR=1.54; 95% CI=1.36-1.74, p<0.001) higher odds to experience depressive symptoms compared to respondents who had a healthy status. Respondents who had poor sleep quality had 6.16 times (AOR=6.16; 95% CI=5.44-6.97, p<0.001) higher odds to experience depressive symptoms compared to respondents who had good sleep quality. Respondents who suffered more chronic diseases had 18% (AOR=1.18; 95% CI=1.10-1.26, p<0.001) higher odds to experience depressive symptoms compared to respondents who had a lower number of chronic diseases. Respondents who had poor physical functioning had 38% (AOR=1.38; 95% CI=1.24-1.54, p<0.001) higher odds to experience depressive symptoms compared to respondents who had good physical functioning. Respondents with normal (AOR=1.24, 95% CI=1.02-1.51, p=0.027) and overweight status (AOR=1.31, 95% CI=1.04-1.63, p=0.018) had 24% and 31% higher odds to experience depressive symptoms compared to respondents with underweight status.

Based on intellectual capital factors, respondents who had a poor cognitive level had 12%
Table 2. Crude Odds Ratio Association Between Components of Human Capital and Depressive Symptoms

| No | Variables                        | OR\(a\) | SE  | 95% CI | P value |
|----|----------------------------------|----------|-----|--------|---------|
|    |                                  |          |     | Lower  | Upper   |
| 1  | Social trust                     |          |     |        |         |
|    | Good                             | Ref      |     |        |         |
|    | Poor                             | 1.37     | 0.07| 1.25   | 1.51    |
| 2  | Cooperativeness                  |          |     |        |         |
|    | Yes                              | Ref      |     |        |         |
|    | No                               | 1.54     | 0.43| 0.89   | 2.66    |
| 3  | Social network                   |          |     |        |         |
|    |                                  | 0.99     | 0.01| 0.97   | 1.02    |
| 4  | Perception of life satisfaction  |          |     |        |         |
|    | Satisfied                        | Ref      |     |        |         |
|    | Not satisfied                    | 1.58     | 0.08| 1.43   | 1.74    |
| 5  | Perception of health status      |          |     |        |         |
|    | Healthy                          | Ref      |     |        |         |
|    | Unhealthy                        | 2.30     | 0.13| 2.06   | 2.56    |
| 6  | Quality of sleep                 |          |     |        |         |
|    | Good                             | Ref      |     |        |         |
|    | Poor                             | 7.17     | 0.44| 6.36   | 8.09    |
| 7  | Number of chronic disease        |          |     |        |         |
|    |                                  | 1.25     | 0.04| 1.18   | 1.32    |
| 8  | BMI                              |          |     |        |         |
|    | Underweight                      | Ref      |     |        |         |
|    | Normal                           | 1.08     | 0.10| 0.91   | 1.30    |
|    | Overweight                       | 0.99     | 0.10| 0.81   | 1.21    |
|    | Obesity                          | 0.84     | 0.08| 0.70   | 1.01    |
| 9  | Physical functioning             |          |     |        |         |
|    | Good                             | Ref      |     |        |         |
|    | Poor                             | 1.76     | 0.09| 1.60   | 1.94    |
| 10 | Status of smoking                |          |     |        |         |
|    | No                               | Ref      |     |        |         |
|    | Yes                              | 1.07     | 0.05| 0.98   | 1.18    |
| 11 | Log income                       |          |     |        |         |
|    |                                  | 0.90     | 0.01| 0.87   | 0.92    |
| 12 | Occupation                       |          |     |        |         |
|    | Working                          | Ref      |     |        |         |
|    | Not working                      | 1.22     | 0.08| 1.07   | 1.39    |
| 13 | Level of cognition               |          |     |        |         |
|    | Good                             | Ref      |     |        |         |
|    | Poor                             | 1.28     | 0.06| 1.16   | 1.40    |
| 14 | Level of education               |          |     |        |         |
|    | Higher                           | Ref      |     |        |         |
|    | Middle                           | 1.42     | 0.10| 1.23   | 1.63    |
|    | Lower                            | 1.55     | 0.12| 1.34   | 1.80    |
| 15 | Age (years)                      |          |     |        |         |
|    | 15-19                            | 2.53     | 0.50| 1.72   | 3.73    |
|    | 20-24                            | 1.95     | 0.28| 1.47   | 2.57    |
|    | 25-29                            | 1.35     | 0.17| 1.05   | 1.73    |
|    | 30-34                            | 1.23     | 0.15| 0.97   | 1.57    |
|    | 35-39                            | 1.18     | 0.15| 0.93   | 1.50    |
Emotional Capital

Respondents who felt life dissatisfaction tended to develop depressive symptoms. This finding is similar to a 15-year follow-up study among a healthy Finnish population [28]. Research among university students found that life satisfaction and happiness will prevent respondents from developing depression [29]. Other study suggested that life dissatisfaction is associated with a poor health outcome, including a long-term bad health outcome [30]. Emotional capital is an important base for surviving in the community and society [31]. Therefore, mature emotional capital is expected to be the first step of an emotionally healthy individual.

Physical Capital

Physical capital consists of self-rated health, sleep quality, number of chronic diseases, BMI, and physical functioning. All factors were significantly associated with depressive symptoms. Our research showed that respondents with poor health increase the risk of depression symptoms by 1.5 times. A longitudinal study in Japan among the middle-aged and elderly found that poor health status increases the risk of depression; the risk was higher among women than men (2.4 vs 2.0) [32]. Additionally, perception of health status influence how people behave: if they value themselves healthy, they will behave healthily and vice versa [33].

Our study discovered that poor sleep quality caused depression symptoms to be six times higher compared to good quality sleep. This finding is similar to studies in Australia [34] and Finland [35]. Another study suggested sleep quality was a trigger to maladaptive emotional regulation that caused symptoms of depression [36]; emotional regulation was a mediator in how sleep quality induces depression symptoms. Also, sleep disorders can be a sign of early depression [37].

DISCUSSIONS

General Finding

Social capital (social trust and social networks), emotional capital (perception of life satisfied), physical capital (self-rated health, sleep quality, number of chronic diseases, BMI, and physical functioning), financial capital (income), and intellectual capital (cognitive level and education level) related to depressive symptoms.

Social Capital

Social trust and social networks had a significant relationship with depressive symptoms. This is consistent with several previous studies that state that the level of trust is related to depression [21-24]. Besides, the results of this study are consistent with several studies which state that individuals who feel socially isolated tend to have more symptoms of depression than those who have extensive social networks [23]. The utilization of social trust and social networks in several countries has been recognized to reduce symptoms of depression. Studies in South Korea also found that social trust among family members can reduce symptoms of depression [22]. According to a study in China, good social trust and social networks reduced depression symptoms [24], and by fostering a conducive and safe community, we can reduce depression [21]. Potentially, efforts to prevent depression could be implemented in Indonesia, as it has a culture of gotong-royong (mutual assistance) [25]. In addition, several studies have proven that community participation could improve health, mental health, and well-being [26,27].

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Our study found that an increasing number of chronic diseases will increase the risk of depression. Previous studies had reported that productive age with chronic disease would increase the risk of depression [38,39]. For
Table 3. Adjusted Odds Ratio Association Between Components of Human Capital and Depressive Symptoms

| No | Variables                              | AOR^b | SE  | 95% CI Lower | 95% CI Upper | P value |
|----|----------------------------------------|-------|-----|--------------|--------------|---------|
|    |                                        |       |     |              |              |         |
|    | **Social Capital**                     |       |     |              |              |         |
| 1  | Social trust                           |       |     |              |              |         |
|    | Good                                   | Ref   |     |              |              |         |
|    | Poor                                    | 1.26  | 0.07| 1.13         | 1.40         | <0.001  |
| 2  | Cooperativeness                         |       |     |              |              |         |
|    | Yes                                     | Ref   |     |              |              |         |
|    | No                                      | 1.15  | 0.35| 0.63         | 2.12         | 0.639   |
| 3  | Social network                          |       |     |              |              |         |
|    |                                         | 1.03  | 0.01| 1.004        | 1.06         | 0.024   |
|    | **Emotional Capital**                   |       |     |              |              |         |
| 4  | Perception of life satisfaction         |       |     |              |              |         |
|    | Satisfied                               | Ref   |     |              |              |         |
|    | Not satisfied                           | 1.39  | 0.08| 1.25         | 1.55         | <0.001  |
|    | **Physical Capital**                    |       |     |              |              |         |
| 5  | Perception of health status             |       |     |              |              |         |
|    | Healthy                                 | Ref   |     |              |              |         |
|    | Unhealthy                               | 1.54  | 0.10| 1.36         | 1.74         | <0.001  |
| 6  | Quality of sleep                        |       |     |              |              |         |
|    | Good                                    | Ref   |     |              |              |         |
|    | Poor                                    | 6.16  | 0.39| 5.44         | 6.97         | <0.001  |
| 7  | Number of chronic diseases              |       |     |              |              |         |
|    |                                         | 1.18  | 0.04| 1.10         | 1.26         | <0.001  |
| 8  | BMI (kg/m^2)                            |       |     |              |              |         |
|    | Underweight                             | Ref   |     |              |              |         |
|    | Normal                                  | 1.24  | 0.12| 1.02         | 1.51         | 0.027   |
|    | Overweight                              | 1.31  | 0.15| 1.04         | 1.63         | 0.018   |
|    | Obesity                                 | 1.13  | 0.12| 0.92         | 1.39         | 0.251   |
| 9  | Physical functioning                    |       |     |              |              |         |
|    | Good                                    | Ref   |     |              |              |         |
|    | Poor                                    | 1.38  | 0.08| 1.24         | 1.54         | <0.001  |
| 10 | Status of smoking                       |       |     |              |              |         |
|    | No                                      | Ref   |     |              |              |         |
|    | Yes                                     | 1.13  | 0.08| 0.98         | 1.31         | 0.093   |
|    | **Financial Capital**                   |       |     |              |              |         |
| 11 | Log income                              |       |     |              |              |         |
|    |                                         | 0.94  | 0.02| 0.91         | 0.97         | <0.001  |
| 12 | Occupation                              |       |     |              |              |         |
|    | Working                                 | Ref   |     |              |              |         |
|    | Not working                             | 0.95  | 0.07| 0.82         | 1.11         | 0.516   |
|    | **Intellectual Capital**                |       |     |              |              |         |
| 13 | Level of cognition                      |       |     |              |              |         |
|    | Good                                    | Ref   |     |              |              |         |
|    | Poor                                    | 1.12  | 0.06| 1.01         | 1.24         | 0.030   |
| 14 | Level of education                      |       |     |              |              |         |
|    | Higher                                  | Ref   |     |              |              |         |
|    | Middle                                  | 1.15  | 0.09| 0.98         | 1.34         | 0.078   |
|    | Lower                                   | 1.36  | 0.12| 1.15         | 1.63         | 0.001   |
|    | **Covariates**                          |       |     |              |              |         |
| 15 | Age (years)                             |       |     |              |              |         |
|    | 15-19                                   | 2.25  | 0.51| 1.44         | 3.52         | <0.001  |
|    | 20-24                                   | 1.94  | 0.32| 1.41         | 2.67         | <0.001  |
|    | 25-29                                   | 1.53  | 0.22| 1.15         | 2.03         | 0.004   |
|    | 30-34                                   | 1.46  | 0.20| 1.11         | 1.92         | 0.007   |
example, a study in South Korea among the middle-aged and elderly, the adjusted odds ratio was higher among the middle-aged with chronic diseases compared to the elderly to experience depression [38]. Although we did not differentiate the types of chronic disease, some studies suggested that cancer, diabetes mellitus, myocardial infarction, arthritis, hypertension, and pulmonary disease were commonly found in patients with depression [40,41].

Our study discovered that respondents with normal and overweight BMI had higher depressive symptoms compared to underweight respondents. Many researchers found that obesity had positive correlation with depressive symptoms [42,43], meaning higher levels of depressive symptoms were associated with increased body obesity [44]. However, in this study, we found that respondents who were obese were not associated with depressive symptoms. Several other studies have also found different results such as higher levels of depression being associated with lower rates of obesity or vice versa and or even no association or mixed results [45-49]. Possible explanations for the varying results were differences in demographic factors, socioeconomic status, ethnicity, nationality, and health status.

Poor physical functioning is significantly associated with symptoms of depression. In line with a previous study among adults in the Netherlands [37], South Carolina [50], and Indonesia [15]. The risk of poor physical functioning would increase symptoms of depression among people with comorbidities [50,51]. Another study found that 28% of people with physical functioning limitations showed signs of clinical anxiety and depression [52].

Financial Capital

Income, a part of financial capital, was significantly associated with depressive symptoms. Higher income decreased the odds of experiencing depressive symptoms. This result is in line with the finding from national surveys in the United States [53]. Financial strain or financial distress, the stressful feeling about financial situations, is one of the underlying factors that explain this association [54,55]. The low-income population is more likely to experience financial strain/distress. Limited access to basic needs, such as healthy food, clothing, housing, and health, puts them in a miserable condition that can trigger depression [54,55].

Intellectual Capital

All components of intellectual capital had a significant association with depressive symptoms. The odds of getting depressive symptoms were higher in someone who has poor cognition and lower educational level. This finding is consistent with national surveys in the United States, Australia, and some countries in Europe [56-59]. Cognitive function shows a person’s ability in reasoning, remembering, perception, and also concentration. Someone who has poor cognition was more likely to experience difficulty conducting daily activities. This impairment can cause various problems that lead to depressive symptoms [56]. Education has an important role in the formation of people’s knowledge, attitudes, and behavior. This capacity helps them to determine what must they do in dealing with stressors [59]. Education level may be related to the ability in processing and understanding information [58,59]. Those with higher levels of education have more access to mental health information and have healthy lifestyles [57]. Education is also related to socioeconomic status. Higher educated people have better life satisfaction, higher incomes, good careers [57]; they have adequate resources and higher resilience to cope with stressors [58].

Strength and Weakness

The strength of this study related to a large study sample. The data were obtained from a national survey, so it provided sufficient statistical power and the results
were generalizable. Moreover, the data collection process was carried out by trained personnel and used validated instruments. Information bias might exist in this study. Data were collected based on the respondent’s recall so there was a possibility that they could not remember the previous conditions. The use of a cross-sectional design could not explain the existence of a causal relationship between the components of human capital and depression symptoms.

CONCLUSION

Increasing human capital is thought to contribute to decreasing depressive symptoms. Thus, the creating of health improvement program/policy changes needs to be emphasized on the components of human capital. Understanding the role of human capital in mental health has broader public health implications in terms of treatment and prevention programs. Components in human capital must be considered when creating mental health programs at the individual and population levels. Of all the components of human capital, physical capital has the most attributes associated with the risk of depressive symptoms. Therefore, depression prevention programs can be prioritized on attributes related to physical capital. Human capital can be used as a mechanism for health promotion. Increasing human capital in a community can be fostered by emphasizing community development, which can be enhanced by defining objectives at the community level, mobilizing resources, and developing plans to overcome collective problems. Through the development of human capital in society, the problem of inequality in health and well-being can be addressed directly.

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