

Winter 12-6-2020

Are countries with higher levels of mental health cases experience higher divorce rates?

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Final Research Proposal

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RSCH 202 Intro to Research Methods

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6 December 2020

Abstract

This paper aims to determine if spouses' mental health can be a factor affecting the divorce rate of marriage. A regression analysis is carried out to determine how the percentage of mental health cases in a country's population affects the divorce rates of a country, while controlling the effects of labour force participation and income. The data from the selected 20 countries are collected from reputable world organizations selected. The results obtained from the regression analysis show that mental health has a marginally significant association with divorce rate and the association between income index and divorce rate is statistically significant.

Keywords: mental health, labour force participation rate, income, divorce, depression, anxiety

1. Introduction

Mental health issues are a rising health problem that is being faced by many and it can affect or develop at any stage of a person's life. Having any sort of illness can hinder one from going about their daily lives or social engagement, which can lead to rising problems in their relationships. In 2017, approximately 10.7% of the global population suffer from some sort of mental health disorder, and out of these, the most common disorders are depression with approximately 3.4%, and anxiety disorders with approximately 3.8% (Ritchie, 2018). At the same time, there has also been a significant increase in marital dissolution which includes divorce, separation, or annulment of a marriage. Globally, between 1970 and 2008, the divorce rate has more than doubled, from 2.6 divorces for every 1,000 marriages to 5.5 (DePaulo, 2019).

Both mental health and divorce are important issues that have been on a rise, making them both important issues. When one of the spouses has a mental illness in a marriage, it can be hard for couples to handle and as times pass, the built-up feelings of pain, resentment, and frustration can destroy relationships and lead to a divorce. Past studies tend to agree that health problems, in general, can be a factor that causes divorce of marriage (Moore, 2018). This research paper will address the limitations of past research done and finding an association on the topic of mental health of both spouses affecting the divorce of marriage.

2. Literature Review

Based on previous research in this area, it has shown that most of the research is about the implications of divorce on the mental health of both spouses, however, as compared to research on how the mental health of both spouses can predict divorce, it is considerably lesser. When it comes to the factors that can lead to the divorce of a marriage, it is more commonly related to employment, education, or income of spouses, there are limited

resources regarding mental health leading to the divorce of marriage. In the following research, the authors are able to clearly show the association on how mental health of spouses can lead to the divorce of their marriage.

A multinational study by Alonso et al. (2011) examined the predictive associations of mental disorders with divorce. The objective of the study is to demonstrate an extensive range of mental disorders such as anxiety, mood, impulse, and substance with divorce across a number of countries. The authors believed that mental disorders may be caused by how one's ability to build and nurture a relationship. In the worst-case scenario, it may lead to adverse life course consequences. In other words, the association between mental disorder and subsequent divorce is in relation to the association between mental disorder and subsequent marriage. Divorce comprises people who went through the stage of divorce and/or the death of their spouse since their first year of marriage, as well as those who were still married to their first spouse.

The study was first conducted in 19 countries with three different levels of earnings; low, middle and high. The diverse cross-national epidemiological sample was used involving every aspect of different financial backgrounds to avoid biases and inaccuracy. Also, consistent monitoring with standardized World Health Organization (WHO) procedures across all the selected countries was employed throughout the experiment progress to obtain the data required. Furthermore, Bayes and Akaike models were applied to evaluate two additional analyses. One, the dummy variables of mental disorders to measure whether and how comorbid disorders (that may be affected by independent risk factors or exacerbated by overlapping disorders) impact the outcomes of disorders and divorce. Two, assessing the interactions between marriage and divorce associated with disorders, with marriage defined from "on-time" to "late" and the months dating prior to marriage. In addition to the

aforementioned experiments, a separate survival model was created to analyze the relationship between premarital mental disorders and the age of first divorce in all countries.

The result indicates that mental disorders are capable of increasing the likelihood of divorce among people who marry that are categorized from early to late marriage. The sub-variables of mental disorders as mentioned earlier contributed to a substantial amount of positive percentage to divorce, indicating that there was a presence of the disorder in the outcomes. Mental disorders come in many forms and the results managed to conclude the results of specific disorders. For instance, impulse control disorders were tested to be consistent across the countries and major depression was one of the attributes that the majority of the candidates suffered from.

The researchers had also conducted a study similar to the current study. Both of the associations of mental disorders with divorce were seemed to be consistent across the countries even though there were wide cross-national variations in the baseline divorce rates.

A study about the social selection of mental distress and divorce was conducted by Borren et al. (2015). The purpose of this study is to measure the rate of divorce from various pathways of mental distress and illness. The focus was placed on the spouses themselves and individually. The authors believed that the risk of divorce may lead to both couples with mental illness selecting each other as partners and one of the two spouses with depressive symptoms leading to poor health physically and socially. Even though information of one spouse is enough to examine the divorce rate, mental distress status of both spouses would provide a more in-depth connection between the two variables.

A group of 20,233 couples among the Norwegian population, aged 20 years and older, were asked to participate in the experiment. The study was based on the 16 years follow-up period to ensure that the result will not confound by the causation effects. The participants were required to fill up two questionnaires using the Global Mental Health index

(GHM), designed to measure the symptoms of anxiety and depression. In line with the multiple linear regression analysis, outcomes could be drawn according to the weights placed on each mental health item in the GHM. Additionally, long-term selection effects were also analyzed by the hazard of divorce model.

The couple-level data concluded that divorce rate can be affected by both single and a pair of mentally distressed partners. The hazard of divorce model shows that one mentally distressed partner seemed to encounter a higher divorce rate than the two mentally distressed partners. However, both contributed to the increase in divorce rate as compared to couples with no mental distress. In the result, there was an interaction effect that discussed that the couple-level phenomenon led to a certain protective effect. In contrast to individual-level phenomena.

In a research by Butterworth and Rodgers (2008), the authors discuss the relationship between the mental health of both spouses and whether it can predict the disruption of their marriage. The research was done by collecting a large population-based data from 2001 to 2004 of the Household Income and Labour Dynamics in Australia (HILDA) survey. The HILDA survey used a multi-stage sampling approach, by sampling households within dwellings within Census Collection Districts. During wave 1, a total of 3,866 couples in which both spouses completed personal interviews and self-completed questionnaires; however, of these, 30 couples had a spouse die during the follow-up period and 600 couples in which neither spouse was followed across the other three subsequent waves. The HILDA survey does not include assessment of psychiatric disorders, hence, the key predictor for this analysis is the Mental Health Inventory (MHI). From the numerous studies conducted, it is shown that MHI has good validity and clinical utility and is an effective screening instrument for depression and anxiety. The results of the study were able to prove that in a couple when

either of the partners reported poor mental health, the couple had a greater rate of marital dissolution as compared to couples where both parties do have any mental health issues.

As the sample units were being observed over 36 months where follow-up research had been done, allowed the authors to have sufficient time for proper observation. The authors also compared the results of both spouses having mental health with other possible variables that may affect couples to divorce, this provides stronger evidence that the presence of mental health issues in a marriage can lead to divorce. With the professionally curated tests, the results obtained in this study are convincing and can be used to support and prove the alternative hypothesis whereby there is an association between the mental health of couples and the divorce rate.

A study by Eaton et al. (2017) addressed the limitations of past research and used the data from the National Comorbidity Survey (NCS) panel study, which provides an exceptional opportunity to examine the long-term association between the mental health of couples and their marital outcomes. The NCS panel study includes two waves, 1990-1992 NCS (first wave) and 2001-2003 NCS (second wave), and in these two waves, only a total of 5,001 respondents completed both interviews. The results obtained from the study show that there were significant associations between major depressive disorder and generalized anxiety disorder with divorce, which shows that there is an increased odds of divorce among couples with one of the partners suffering from these disorders. This study was convincing as the authors used data from the NCS, which was a nationally representative survey of the U.S. household population aging from 15 to 54 that focused on estimating the prevalence and correlates of mental and substance disorders and was being conducted by professional interviewers. The authors also assessed the possibility of nonresponse bias in several ways and took precautions to prevent nonresponse bias by providing a \$25 token payment, assuring

respondents that their responses were treated confidentially by law and that they are free to terminate the interview at any point of time.

Ultimately, the study conducted by Eaton et al. (2017), managed to address some of the previous limitations and provided constructive evidence for the association between mental disorders and divorce. The study included several baseline controls and prevented nonresponse bias which helps improve the quality of the results obtained and helped to prove the alternative hypothesis.

Military deployment can be one of the contributing factors that causes mental health issues in spouses. It impacted the military couples in a way in which they had to suffer from an increasing level of stress. This kind of problem tends to affect the quality of marital relationships, thus leading to the possibility of increasing divorce rate. According to a study conducted by Alcaraz et al. (2015), the divorce rate had increased due to the “initiation of military operations on Iraq and Afghanistan after September 11th” (para. 2). The potential effects of divorce were mostly caused by the posttraumatic stress disorder (PTSD) and serious injuries of the service members.

A group of individuals that consists of men and women were invited to participate in Millennium Cohort Study to assess the short-term and long-term health outcomes. To find the relationship of divorce rate and mental health of the service members, participants included the five service branches such as active duty, National Guard, and Reserve. A PTSD Checklist-Civilian Version was employed to measure a person’s PTSD status for the following test using PRIME-MD Patient Health Questionnaire for those who met the criteria of scoring 50 or more for positive PTSD symptoms. In addition, follow-up surveys using Mental Component Summary (MSC) , which then proceeded to evaluate the mental functioning using Medical Outcomes Study Short Form 36-item Survey for Veterans (SF-36 V). Based on the methods used, the researchers had found significant relationships between

divorce and the development of new-onset PTSD. PTSD has also been analyzed to be related to issues such as hostile behavior and difficulties in intimacy, and is more likely to lead to the separation of both spouses.

The previous research was replicated to ensure that there would be sufficient time to detect the certain outcomes that were more likely to develop after the follow-up period of 3 years. In the recent study, representatives of both men and women are included instead of the majority of respondents to be women from the previous study. Nonetheless, both experiments were capable of measuring the importance of time frame as the most important factor in emotional resolution.

In the literature mentioned earlier, the authors were able to prove that spouses' mental health do have an association with the divorce of marriage, however, there are other control variables that can lead to the divorce of marriage, some of these control variables include relationship dissatisfaction, unemployed and income of spouses. These variables have negative implications on marriages, that can ultimately lead to the divorce of marriage.

Relationship dissatisfaction can have a negative impact on marriage, which ultimately leads to the divorce of marriage. In a study by Røysamb et al. (2013), the authors' first objective was to identify risk factors for relationship dissolution in 18,523 couples in Norway, with a particular focus on individual dissatisfaction with the relationship. The second objective of the study was to assess interaction effects between relationship dissatisfaction and other predictors of relationship dissolution. The data was collected from a questionnaire from the population-based Mother and Child Cohort Study (MoBa) that was conducted at the Norwegian Institute of Public Health. MoBa is a cohort study that includes more than 100,000 pregnancies recruited between 1999 to 2008 which presents a broad basis to study health development. The study was carried out over 5 different periods which started from the 17th gestational weeks (t1) to the 36months postpartum (t5), however, a limitation

mentioned was that out of the 90,190 from the planned sample only 46,188 women had been in the study long enough to participate in t5. Due to the planned sample size previously, the authors found that some of the data collected were slightly biased and some of the questions were not answered, hence, after sorting the data they came to a new sample size of 18,523 couples, which is still a considerably large sample size.

The study discusses that there is significant evidence between depression and divorce, as depression can impair relationships to the point of dissolution; however, the loss of a romantic relationship also confers a significant risk of depression. The results obtained showed that in a divorce, albeit having all variables mutually controlled, the divorce of marriage remains strongly associated with high relationship dissatisfaction in women and low education in men. The results provided in the study by Røysamb et al. (2013) were strongly convincing as they were able to involve a large sample unit of 18,523 and at the same time mutually control all its possible risk factors that may cause a divorce. They successfully showed the different results obtained for each variable which allowed a clear comparison. This shows that relationship dissatisfaction may be one of the independent variables that can cause the divorce of marriage.

Akadiri et al. (2020) discussed the relationship between income and gender unemployment in divorce rate. The study was conducted for the Organization for Economic Cooperation and Development (OECD) countries. Based on the experiment, income stability is important when it comes to sustaining marital relationships. Economic factors play a role in before and during a relationship or marriage. In order to start a relationship, there is a need to have a minimal level financial sufficiency. As the relationship progresses into a marriage, children and other living expenses are involved that affects the financial management in the household. In addition, the researchers believed that male unemployment level had a large

contribution to the increase in divorce rate in the long run compared to female unemployment.

The panel study selected 33 OECD countries to examine a number of relevant variables such as the gross domestic product per capita, unemployment in male and female, marriage and divorce rate. With the data, a dynamic autoregressive distributed lag (ARDL) is adopted for long-run estimation of the 4 variables, excluding the divorce rate. Then, Granger causality test was employed to predict the future occurrence of divorce using the historical information of female and male unemployment rates.

The study concluded that the level of economic growth affects the divorce rate and decrease in income per head for partners in a relationship encourages the increased rate of divorce. However, the results failed to show that the female unemployment level would ultimately reduce the divorce rate. Instead, male unemployment had an impact on the increasing divorce rate assuming that men play the role of sustainability in the family.

As compared to the study conducted by Gonzalez-Val and Marcen (2018) in a different study, the researchers have used a more concise panel to estimate the divorce rate among the OECD countries in the current experiment. Also, they provided an in-depth analysis in studying the relationship between unemployment level on divorce in the OECD. Though both studies were carried out on the same purpose, data were collected in different countries and the previous study revealed negative correlations between unemployment and divorce rate.

In the previous research by Røysamb et al. (2013), it is said that when a divorce happens, women tend to have higher relationship dissatisfaction, and in a study conducted by Allison et al. (2011), the authors are able to obtain that when wives report having better than average marital satisfaction, the employment does not affect either of the spouses.

Unfortunately, this is not the case when marital dissatisfaction is reported by the wives to be

below average, as the employment of the spouses can affect their relationship. This data of the study was collected through three waves of the National Survey of Families and Household (NSFH). The NSFH is a national probability sample survey consisting of 13,007 adults that are age 19 and older interviewed in 1987 to 1988 in the U.S., where one of the adults was randomly selected as the primary respondent and the spouse had to complete a self-administered questionnaire. Wave 2 of the study was conducted from 1992 to 1994 by obtaining data from both of the spouses, and wave 3 was collected from 2001 to 2002. The dependent variable of the study is whether a breakup occurred and if so, which of the spouses initiated it. As one of the major focuses is how the spouses' employment affects either of the spouse leaving the marriage, employment was used as an indicator of economic resources rather than annual earnings.

As marital dissatisfaction is also one of the variables measured, the authors constructed a "Better-Off divorced" scale from five questions, and respondents were required to answer these questions to analyze their level of marital dissatisfaction. The results of the study showed that men's unemployment and women's employment increase divorce as this violates the norms and women are able to provide a way to support themselves even out of the marriage when they are unsatisfied with their marriages. The study was carried through a few decades, which makes the data convincing as the lifestyle and employment changes, however, due to how dated the data is being collected, the data may not apply to our current times, even though women's employment is increasing as well.

2.1 Research Question

Mental health issues between spouses can be detrimental to their marriage or relationship, as mental health can affect social engagement, communications, behaviours and lifestyle. All these factors can be important in sustaining a marriage, with mental health, it can be challenging for both spouses. According to the literature that was being discussed,

even with the other control variables being included in the studies, mental health display to cause the divorce of marriage. With the extensive research done previously, our paper will focus on if a country's mental health rate has an association with the divorce rate in the country, where a total of 20 countries selected based on their Human Development Index (HDI).

2.2 Theoretical Framework

Based on the discussed literature, there are possible variables that can cause the divorce of a marriage. The dependent variable in this research would be the divorce of a marriage, and there are a few independent variables where the key variable for this research would be the mental health of spouses and the other control variable can include employment, income, and marital dissatisfaction.

Widespread research into the issue of mental disorders has led to the theoretical approaches for the researchers to analyze the divorce rate across multinational countries. The question to these studies is, how can an individual's psychological state impact his or her attitudes towards divorce? In other words, is there a significant relationship between mental disorders and divorce rates? Mental illnesses often can affect a person's behaviors and thoughts, such as anxiety, depression, etc. These conditions can deeply impact day-to-day living, which will subconsciously begin to affect others. The instability of a mindset is also a detriment to the marital relationships especially when one or both the spouses failed to improve their mental clarity. The consequences of a marital relationship may be led by a few reasons for mental illnesses. One, spouse(s) may already have an unsatisfactory level of behavioral adjustment before marriage; however, it intensifies with the level of stress from sustaining the family. Otherwise, the change in emotional and mental behavior is only visible once the spouse(s) open to new life for some time. Nevertheless, uncontrollable

psychological behavior and attitudes may have a possibility of negatively affecting a relationship, in the worst case, resulting in divorce.

According to Alonso et al. (2011), the article stated that “there is some evidence of a departure from additivity in the joint effects of multiple co-occurring disorders on divorce, but only at very high levels of comorbidity which affect a small portion of the population” (p. 483). The existence of comorbidity occurs when one person suffers from a psychiatric disorder after another, and it is usually known as the condition that is associated with worse and complicated mental outcomes. It affects a relationship in a way that the couples have negative communication patterns, which gradually pushes the connection between the two spouses further apart.

Furthermore, a study conducted by Alcaraz et al. (2015) stated that “recent research has shown that divorce is a risk factor for depression, posttraumatic stress disorder (PTSD)” among the military members (p.1). PTSD is a condition triggered by experiencing or witnessing a terrifying event that causes major trauma or nightmare. The victims with this condition react and behave involuntarily as if they have flashbacks of the events going on in their minds. Most of the time, they seem disinterested and isolated themselves as a way to clear their mind and block out painful memories. Trauma survivors tend to have problems with trust and communication. They lose interest in the relationship and have trouble with intimacy.

All of the mental disorders can have a huge impact on the couples’ feelings and perceptions towards their marital relationships. Anyone can be reported with mental illness, and it is always a possibility of seeing one or both of the spouses suffering from the mental issue(s). In the article, Borren et al. (2015) discussed the associations between mental distress and divorce in individual -and couple-levels, in which they concluded from their experiment that “couples with one or two mentally distressed partners in our study have a persistently

higher risk of divorce than couples in which neither partner suffers from mental distress” (p. 2). Also, even when couples selected each other as partners due to similar mental conditions, there was still a higher chance of getting a divorce. One can indeed overcome emotional and mental stress when the other one in the relationship provides support to him or her. However, the partner providing care to the spouse may exhibit signs of burnout in the long run that is more likely to worsen the original symptoms of the mentally-distressed person. Which, resulting in surface-level conversations and ignorance. As it goes on for years, they will eventually lose interest in each other; thus, leading to divorce.

Mental illness comes in a form of mild, moderate, and severe condition. Different people behave and act differently despite their suffering from the same conditions. Some of them can easily overcome the problems with the support of the people around them; however, some conditions may only worsen themselves if it is not under proper control. Mental illnesses can be developed easily and the severity of the problems can be increased as the days continue. If one partner is willing to take the initiative to maintain the relationship, the couples are more likely to be back on track. Otherwise, the person who is suffering from mental instability due to the stress coming from the other spouse and/or children, he or she will most probably think of divorcing to escape the situation. Similarly, the caregiver may try to escape from the problem as he or she grows emotionally and physically exhausted.

3. Study Design

This study investigates if countries' mental health rate has an impact on the country's divorce rate. This research topic does not only have one possible research design, however, an experimental research is the most suitable research design. By conducting an experimental research, the analysis obtained allows a statically valid generalization on a wider population. So, the research question is “Are countries with higher levels of mental health cases experience higher divorce rates?” There are two hypotheses to this question, a null hypothesis

and an alternative hypothesis. The null hypothesis (H_0) is that there are countries with higher levels of mental health cases that do not experience higher divorce rates, and the alternative hypothesis (H_a) will be that countries with higher levels of mental health rates experience higher levels of divorce rates.

3.1 Experimental Research

Experimental research uses inferential statistics for analysis, which provides results that allows the researcher to make statistically valid generalization from a sample to a wider population (Greener & Martelli, 2020). Before beginning the study, we first identify both dependent and independent variables of the research. The dependent variable is the divorce rate, and the independent variables are mental health, employment, income, and relationship dissatisfaction, where the key independent variable would be mental health. With the variables identified, data of the variables will be retrieved from reputable sources.

3.2 Cross-Section Data

The type of data we wish to collect will be cross-sectional data. Cross-sectional data is data sets collected by observing various subjects at the same time, therefore, the various subjects refer to the different countries we have chosen to collect our data from. Our study will be based on country-level data and the data will consist of dependent variables (divorce rate) and independent variables (income, labor force participation, and mental health). The countries include Australia, Ireland, Singapore, Korea, United Kingdom, United States, Luxembourg, Netherlands, Cyprus, Israel, Mexico, Suriname, Mauritius, Turkey, Jamaica, Serbia, Guatemala, Uzbekistan, Armenia, and Peru. These countries come from different regions in the world, which provides us with a wider geographical variation of data. The data collected would include the total number of cases of depressive disorders and anxiety disorders and the percentage of cases in the population. Besides, data for labor force participation rate and income index will be included as well.

3.3 Data Collection and Analysis

The data needed for this study will be collected from reputable organizations such as the World Health Organization (WHO), The World Bank, and the United Nations Development Programme. In addition to that, we will be focusing on the data that are recorded in the year 2015 to ensure that all the data will be collected from the same period. For the analysis of data, a regression analysis will be carried out to find out the relationship between the dependent and independent variables. Additionally, we will be able to know the impact of the various independent variables on the dependent variable from the coefficient of the independent variables.

3.4 Population and Samples

The population that will be polled from the research is the population of people from the 20 selected countries. From the population, a multi-stage cluster sampling will be carried out to select the countries that we will collect the data from. Since it will not be practical to conduct a study based on the whole population, we have selected 20 countries that are from different regions of the world based on their HDI. HDI is created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not solely just the economic growth of the country. In addition to that, HDI provides a summary measure of the average achievement in three key dimensions of human development, which are long and healthy life, being knowledgeable, and having a decent standard of living (United Nations Development Programme, n.d.). With this information, we selected the 20 countries with the HDI ranging from 0.939 to 0.640. We believed that the sample size from the selected 20 countries would give us a large population for the study to avoid biases and inaccurate results. Furthermore, the study will perform an in-depth analysis to find the correlation between the dependent variable and independent variables.

4. Variables and Measures

There are a total of one dependent variable and three independent variables in the study. The dependent variable is the crude divorce rate (CDR). The CDR is the annual number of divorces occurring per 1,000 of the total population of the given geographical area during the same year (United Nations, n.d.). The independent variables of the study are the income index, mental health, and labor force participation rate, where the key independent variable is mental health. The HDI income index is calculated based on the gross national income per capita according to the purchasing power parity (PPP) to measure the annual income of the average citizen. The mental health variable is being measured as the percentage of the population of the selected country. The labor force participation rate is the proportion of the population ages 15 years and older that is economically active, and this variable is being measured as the percentage of the population who are either female or male.

5. Data Collection Methods

The data collected is obtained from different reputable organizations with statistics and data relevant to the research topic. The most unbiased way to obtain the data is through the historical data from these reputable websites and statistics organizations. The data comes from the United Nations Development Programme, the WHO, The World Bank, and United Nations Statistics Division.

The data collection begins with collecting the data on HDI to determine which countries to use, the data on HDI is compiled by the United Nations Development Programme in 2015 in the Human Development Reports (HDR). The data is collected based on the HDI from the report, which is a ratio used to rank the countries globally in terms of life expectancy, education, and gross national income per capita. The HDI ranges from 0 to 1 and countries with values greater than or equal to 0.80 ($HDI \geq 0.80$) are considered as a

developed country. Whereas values smaller than 0.80 ($HDI < 0.80$) are considered as a developing country. In addition to that, the divorce rate statistics are collected from the United Nations Statistics Division, where the divorce rate is presented in terms of CDR, which is the ratio measuring the divorces per 1,000 population.

Moving on, the information by WHO is used to obtain the statistics on mental health, the key independent of the research paper. As depression and anxiety disorders are two of the most common mental health conditions, the data on mental disorders are being separated into two categories, depression disorders and anxiety disorders. The total number of cases in each of the samples is recorded as the number of cases and in the percentage of the population. For the other independent variable, income index, we use the HDR by the United Nations Development Programme. For the data on the labor force participation rate, it is collected from The World Bank and is being separated into male and female. This is because both females or males are not being economically stable or in the labor force may cause different reactions to their marriage.

6. Data Analysis

CDR (Crude Divorce Rate)		Mental Health (Depression Disorders) in % of population		Mental Health (Anxiety Disorders) in % of population	
Mean	1.515	Mean	4.725	Mean	4.69
Standard Error	0.15898941	Standard Error	0.11962111	Standard Error	0.27889821
Median	1.7	Median	4.75	Median	4.2
Mode	1.7	Mode	4.8	Mode	3.8
Standard Deviation	0.71102224	Standard Deviation	0.53496188	Standard Deviation	1.2472707
Sample Variance	0.50555263	Sample Variance	0.28618421	Sample Variance	1.55568421
Kurtosis	-0.2145824	Kurtosis	1.12055657	Kurtosis	-1.221808
Skewness	0.14685561	Skewness	0.63670523	Skewness	0.38543412
Range	2.7	Range	2.2	Range	4.2
Minimum	0.4	Minimum	3.7	Minimum	2.8
Maximum	3.1	Maximum	5.9	Maximum	7
Sum	30.3	Sum	94.5	Sum	93.8
Count	20	Count	20	Count	20

Figure 1. Descriptive Statistics of CDR, depression and anxiety disorders

<i>Income Index</i>		<i>labour force participation rate (%) - 15+, male</i>		<i>labour force participation rate (%) - 15+, female</i>	
Mean	0.8267	Mean	72.5100502	Mean	53.0919003
Standard Error	0.02087785	Standard Error	1.65045925	Standard Error	2.28636455
Median	0.832	Median	70.6629982	Median	55.4709988
Mode	0.899	Mode	#N/A	Mode	#N/A
Standard Deviation	0.0933686	Standard Deviation	7.38107817	Standard Deviation	10.2249331
Sample Variance	0.00871769	Sample Variance	54.4803149	Sample Variance	104.549257
Kurtosis	-1.3575031	Kurtosis	-0.247347	Kurtosis	0.09818989
Skewness	-0.328274	Skewness	0.66247365	Skewness	-0.2104565
Range	0.286	Range	27.3499985	Range	42.2240028
Minimum	0.647	Minimum	60.3909988	Minimum	31.4519997
Maximum	0.933	Maximum	87.7409973	Maximum	73.6760025
Sum	16.534	Sum	1450.201	Sum	1061.83801
Count	20	Count	20	Count	20

Figure 2. Descriptive Statistics of income index and labour force participation rate

Figures 1 and 2 simply present the descriptive statistics of all the variables included in our study. In the descriptive statistics, there are several important components such as mean, standard deviation, maximum, and minimum that can help to provide an in-depth and simpler interpretation of our raw data. Mean is a measure of central tendency, which is also the average of a data set. The standard deviation measures how far and disperse each observed value is from the mean. In the study, all the variables have a low standard deviation (standard deviation/mean < 1), which means that the data points have a lower spread in the data and are close to the mean values. Furthermore, the maximum and minimum values determine the highest and lowest observation that can be used to determine the outliers in the dataset. Meanwhile, an outlier is an observation that differs significantly from other observations, in which the data points lie at an abnormal distance from other values in a dataset.

Figure 1 shows the descriptive statistics of CDR and the cases of depression and anxiety in the percentage of the population. The mean of CDR is at 1.515 cases occurring per 1,000 mid-year total population of the given country during the year 2015. The minimum, maximum, and standard deviation of CDR does not show any outliers, and the CDR of the different countries are positively skewed rightwards. For the percentage of mental health cases for both depression and anxiety disorders, they both have a relatively similar mean, however, the minimum and maximum of the two variables have a significant difference. With

depression disorders having a minimum and maximum of 3.7 and 5.9 respectively, and anxiety disorders having a minimum and maximum of 2.8 and 7 respectively. Similarly to the CDR, both the data depression and anxiety disorders are positively skewed rightwards, with no outliers.

For Figure 2 the income index has a mean of 0.8267, the income index represents the GNI per capita. Additionally, the income index has a minimum of 0.647 and a maximum of 0.933. The minimum, maximum, and standard deviation conclusively prove that there are no outliers among the 20 selected countries' income index. As for the labor force participation rate, the male population has a mean of 72.5% and the female population has a mean of 53.09%. Similar to the other independent variables, there are not outliers within the data collected.

6.1 Regression Analysis

Regression analysis is a reliable set of statistical processes that helps to identify the relationship between the independent variable(s) and the dependent variable. In our case, we are looking for how the effect of the independent variables (mental health, income, and labor force participation) can affect the dependent variable (divorce rate). The regression analysis enables us to determine the strength of the relationship between the independent and dependent variables, by looking at the coefficient of the independent variable. This helps in deciding whether the null hypothesis should be accepted or rejected.

Following which, Figure 3 depicts the outcomes with data of P-value, Coefficient, R Square, and Adjusted R-Square that interprets the statistical relationship between variables, how the dependent variable is expected to change according to the statistical trend of the coefficient, and if the independent variables are statistically significant.

6.2 Preliminary Results

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.809306							
R Square	0.6549763							
Adjusted R Square	0.5317535							
Standard Error	0.4865421							
Observations	20							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	5	6.291374545	1.2582749	5.3153838	0.0060513			
Residual	14	3.314125455	0.2367232					
Total	19	9.6055						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-5.917647	2.86865844	-2.062862	0.058187	-12.07031	0.2350132	-12.07031	0.2350132
Mental Health (Depression Disorders) in % of population	0.7065875	0.376241318	1.8780167	0.0813672	-0.10037	1.5135449	-0.10037	1.5135449
Mental Health (Anxiety Disorders) in % of population	-0.192282	0.119792137	-1.605128	0.1307792	-0.44921	0.0646468	-0.44921	0.0646468
Income Index	5.8141318	1.631471646	3.5637345	0.0031148	2.3149731	9.3132905	2.3149731	9.3132905
labour force participation rate (%) - 15+, male	0.0173881	0.024124424	0.7207663	0.482916	-0.034354	0.0691298	-0.034354	0.0691298
labour force participation rate (%) - 15+, female	-0.020183	0.016328651	-1.236021	0.2367883	-0.055204	0.0148389	-0.055204	0.0148389

Figure 3. Results of Regression Analysis

The equation to estimate is $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$, where Y represents the dependent variable, divorce rate, X would represent the different independent variables, and β would represent the coefficient of the three independent variables. In the regression analysis result shown in Figure 3, the P-values of independent variables including the labor force participation rate (male) and mental health (depression and anxiety disorders) is greater than the significance level of 0.05 (5%). The labor force participation for male and female has p-values of 0.48 and 0.24 respectively, which shows that the two variables are statistically insignificant at 0.05 (5%) and has no statistically significant impact on the divorce rate. Adding on, mental health for anxiety disorder also has no statistically significant impact on the divorce rate as the p-value is 0.13, which shows that the variable is statistically significant at 0.05 (5%). Meanwhile, mental health for depression has a p-value of 0.08, in which the variable is considered as marginally significant and statistically significant at 0.10 (10%). On the other hand, the income index has a p-value of 0.003, which means that the variable is statistically significant at 0.05 (5%) and has a statistically significant impact on the divorce rate. . Additionally, this meant that the change in value for the income will be multiplied by a

coefficient of 5.81, which will have a significant impact on the dependent variable, the divorce rate.

Moving on, the coefficients of independent variables, mental health for depression, and labor force participation for males are 0.71 and 0.02, respectively. Both the coefficients show positive trends and impact on the divorce rate. Also, the income index has a coefficient value of 5.82, which shows a positive trend and impact on the divorce rate. As for the other independent variables like mental health (anxiety) and labor force participation (female), there is a negative trend and impact of each independent variable on the divorce rate, with the coefficient values of 0.19 (anxiety and divorce rate) and 0.02 (female labor force participation and divorce rate). The R-square and adjusted R-square of the regression analysis are respectively 0.65 (65%) and 0.53 (53%). With the adjusted R-square, the goodness-of-fit of this model can be evaluated, this means that the goodness-of-fit for this model is at 53%.

7. Conclusion

In conclusion, through the data and regression analysis we can determine that our key variables of mental health are marginally significant at 5% level ($P < 0.05$), however, only depression disorders with a p-value 0.08 (8%) for depression disorders is marginally significant. On the other hand, the independent variable, income index, is statistically significant at 5% level ($P < 0.05$), with a p-value of 0.003 (3%). The remaining independent variables, anxiety disorders, and labor force participation rate, are not statistically significant as their p-value exceeds 0.05 (5%). Therefore, through these findings, we can conclude that for mental health only depression disorders rate of a country has a marginally significant impact on the country's divorce rate. As the key independent variable of the research, mental health is marginally significant, we can reject the null hypothesis, and accept the alternative hypothesis.

There are a couple of limitations in the research that has caused an impact on the findings and results. The first implication would be the sample size of only 20 countries. As we are using three independent variables, it would be more ideal to have a sample size of 30 instead to have better results from the regression analysis; therefore, more countries would be included in the future. The second implication is the key independent variable, mental health. As mental health can be caused by other factors that are included as the research's independent variable like income or employment.

In addition to the limitations, it is possible that there are some policy implications that may have an impact on the key independent variable, mental health. The possible policy implications may be the mental health funding of a country. As it is possible that some countries do not emphasize mental health, and the government does not set aside funding to raise awareness or establish an institution that can provide subsidized mental health treatment for their population. This can ultimately increase the number and percentage of mental health cases within the country.

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