

# Effects of Income Inequality on Satisfaction in Life Perceived by Female Fishermen — Focused on the Mediating Effect of Depression<sup>1</sup>

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## Abstract

The purpose of this study is to examine the mediating effects of depression in the relationship between income inequality and satisfaction in life perceived by female fishermen. To verify the purpose of the study, we used data from a survey of 215 female fishermen residing in Jeollanam-do, Korea, conducted at Jeonnam Women's Plaza (now "Foundation of Jeonam Women and Family") in 2016. Hierarchical analysis and Sobel-test using SPSS ver. 21.0 were used in the analysis. As a result of the analysis, it was confirmed that there is a partial mediating effect of depression in the relationship between income inequality and satisfaction in life. Based on the result, we proposed practical and policy recommendations that can improve the satisfaction of female fishermen in their lives.

## Keywords

female fishermen, income inequality, satisfaction in life, depression, mediating effect, Social welfare practical and policy implications

## Introduction

As young people moved to cities due to the progress of industrialization, the need to secure a lack of labor in fishing communities increased. Hence, women's participation in fishery labor has increased in fishing villages where women's fishing activities were prohibited in the past (Lee, 1993; Oh, 1999; Lee, 2012). This trend has continued until recently. According to the Ministry of Maritime Affairs and Fisheries (2017) the number of female fishermen is continuously increasing to 49.5% in 2000 and 49.8% in 2015. A female fisherman means a fishery owner or a woman engaged in fishing. Recently, the government plans to include women engaged in seafood processing and distribution into the category of female fishermen, so the statistical scale of female fishermen is expected to increase further (Ministry of Maritime Affairs and Fisheries, 2017).

The importance of female fishermen by replacing the labor force in fishing villages has emerged (Ministry of Maritime Affairs and Fisheries, 2017), thus the government announced 'the 4th Basic Plan for the Development of Female Fishermen' and presented various policies to improve the satisfaction of female fishermen in their lives. However, despite the government's policy intervention, previous studies consistently point out that female fishermen are experiencing low satisfaction in their lives generally. According to a study conducted by the Gangwondo Women and Family Research Institute (2012) which surveyed female fishermen in Gangwon-do, the percentage of female fishermen who answered that they were not satisfied in their lives was higher than that of women who answered that they were satisfied. The Jeollanam Women's Plaza (2013) which surveyed women in Jeonnam, explained that only 32.4% of the respondents were satisfied with their lives.

On the other hand, although rare, a study (Kim et al., 2005a; Jeonnam Women's Plaza, 2013) has been conducted to present the rationale necessary for improving the satisfaction of female fishermen's lives. Among the various variables raised in these previous studies, economic variables were found to play an important role in the satisfaction of female fishermen's lives. According to a study conducted by Gangwon-do Women and Family Research Institute (2012), 41.0% of female fishermen who answered about variable that make their lives less satisfied were 'unstable income'. And it was found that female fishermen are more sensitive to these household economic problems than male fishermen (Lee, 2016).

In particular, the household economic problem in the fishing villages, which has recently been regarded as a problem, is income inequality. For example, the income disparity between selling farmed eels and abalone, which are commercialized, and selling kelp and oysters, which were harvested from the sea, at street stalls is too great. Although household income in fishing villages has actually increased, the income disparity has deepened, according to statistics. The household income of fishermen in Korea increased from 23,916 won in 2003 to 38,623 won in 2013 (Kosis, 2017), however, the income inequality rate in fishing villages increased 9.7% between 2003 and 2011, and its severity can be confirmed by comparing with 3.9% nationwide (Korea Maritime Institute, 2013). Thus, it was pointed out in the previous study that income inequality can be considered to be a more serious problem than income in fishing villages, and that income inequality is related to satisfaction in life (Graham and Felton, 2005; Jang, 2011).

However, it is difficult to understand the causal structure that exists in the relationship between the two variables, simply because the hypothesis that the degree of income inequality experienced by oneself affects satisfaction in life. For example, as income inequality increases, depression becomes more distorted and negatively perceives life (Beck, 2008),

as a result, is not the satisfaction in life, which is the overall evaluation of individual's life, lowered? This suggests the role of depression exists as a third variable in the relationship between income inequality and satisfaction in life (Beck, 2008). As the researchers think, many studies have supported the significance of the relationship between income inequality and depression (Messias et al., 2011; van Deurzen et al., van Oorschot, 2015), and depression and satisfaction in life (Baltaci and Karatas, 2015; Srivastava, 2016). In the academia of social welfare (Kim, 2014), also assumes that depression is a mediator variable between causes and consequences. Therefore, it is possible to increase the satisfaction of female fishermen in their lives through the alleviation of income inequality, however, it is difficult to alleviate income inequality in a short period of time, hence this study envisages was to find a mediating effect between income inequality and satisfaction in their lives and intervene in the mediator. If depression mediates perceived income inequality and satisfaction in life, a depression-related programs that can ensure the effectiveness of short-term intervention in the field of social welfare practice while waiting for the income inequality alleviation policy to be pursued by setting long-term policy goals.

In this context, this study seeks to examine the mediation effects of depression that can be appeared in the relationship between income inequality perceived by female fishermen and satisfaction in life. The significance of this study is that it provides evidences to improve the satisfaction of female fishermen in their lives through the course of this study.

## Theoretical Background

### 1. Lives of Female Fishermen

Female fishermen account for a large proportion of the fishing population in fishing communities. Even in 2012, 2013 and 2014, female fishermen accounted for a higher percentage of the fishing population than male fishermen (National Statistical Office, 2017). Not only this, female fishermen contribute greatly to the creation of their fishery households. According to a study conducted by Jeonnam Women's Plaza (2016) which analyzed the life conditions survey data of 215 female fishermen who live in fishing villages of Jeollanam-do, 42.9% of female fishermen who responded that they contribute more than 50% of their household income. However, female fishermen remained as marginal people with regard to fishery labor. According to the same study, 61% of female fishermen who responded recognized their husbands as the main managers of fishing activities (Jeonnam Women's Plaza, 2016). Such a trend is also remarkable in fishing communities. A study conducted by Gangwondo Women and Family Research Institute (2012) also pointed out that in the case of fishing village communities, which are major organizations of fishing society, male fishermen play a leading role, while female fishermen play a supplementary role such as preparing meals.

Not only this, female fishermen are suffering from excessive labor. Female fishermen who responded to the survey by Jeonnam Women's Plaza (2016) found that they spend an average of 16.65 hours in a day to fishing, housekeeping, and caring. They work together with their husbands in fishing labor such as fishing labor using fishing boats, and they are in charge of housekeeping such as meal preparation and laundry, and in other hours they work in fields such as chill peppers, which can be understood as a result that they are carrying out heavy labor.

Besides, female fishermen had no time and emotional capacity to care their own health due to the constant labor. According to a study conducted by Jeonnam Women's Plaza (2016), 55.8% of female fishermen responded that their health is poor compared to others, and a study conducted by Gangwondo Women Family Research Institute (2012)

found that 46% of female fishermen recognized themselves as unhealthy. It was confirmed that 93% of female fishermen who responded that they were not particularly healthy had musculoskeletal pain, and about 46% had a constant headache (Gangwondo Women and Family Research Institute, 2012).

Taken together, it can be understood that while female fishermen are charged with their roles in labor and economy, their lives are not comfortable due to heavy labor and health problems, and remain as marginal people rather than being leading in their home and fishing communities.

## 2. Relationship Between Income Inequality and Satisfaction in Life

Income inequality means an increase in the income inequality between individuals (Mckay, 2002; Glenn, 2003). This kind of income inequality is an ever-present problem in our society. This is because even if the gross income of the whole society increases, the problem of income inequality is constantly reproduced as a result (Glenn, 2003). Therefore, there is a need for a social consensus on the questions, "Is current income distribution appropriate?" Or "To what extent should income distribution be made?", before attempting to alleviate income inequality (Litchfield, 1999). Thus, income inequality is a concept that makes it possible to discuss the justification of income distribution and the appropriate level of distribution in a society. That being so, ethical judgment is involved in the process of discussing income inequality (Kim, 2009). However, this study does not attempt to address policies that mitigate income inequality and ethical issues related to income inequality. Rather, it seeks to understand the effects of income inequality on individual lives, which have emerged across society, especially in fishing villages, and more specifically focuses on the relationship between income inequality and quality of life.

Quality of life can be categorized as integrated quality of life, objective quality of life, and subjective quality of life (Lee, 2015), however, in the field of social welfare, there is an increasing tendency to evaluate an individual's quality of life by subjective quality of life (Kim and Jung, 2007; Kim and Shim, 2007). Subjective quality of life means quality of the life that experienced by an individual. Such indicators of the subjective quality of life include subjective well-being and satisfaction in life (Campbell, 1981; Srivastava, 2016). If subjective well-being means the emotional aspect of individual's life, satisfaction in life emphasizes the cognitive aspect of evaluating individual's life compared to others (Diener et al., 1999; Srivastava, 2016). Research emphasizing the emotional aspect of an individual focuses on subjective well-being (Korean Sociological Association, 2011), however, satisfaction in life is relatively objective and can measure in detail in an individual's life, which is relatively more objective than subjective well-being (Lee, 2015; Srivastava, 2016). This study measures the subjective quality of life of female fishermen through the satisfaction in life, which is a cognitive judgment of their own lives. This allows us to measure the lives of female fishermen in a relatively objective and specific way.

As the researchers think, income inequality plays an important role in the satisfaction of women fishermen in their lives. The reason why income inequality significantly affects life satisfaction can be understood through the implications of the concept of income inequality. Income inequality is a concept that includes absolute poverty, where the satisfaction for basic needs is constrained, and subjective poverty which is felt in comparison with others (Danziger and Haveman, 2001; Choi, requoted from 2014: 27). Considering that the satisfaction in life is "a general assessment for individual's life rather than the current feelings and emotions" (Srivastava, 2016: 1), it can be understood that lack of needs and the perception that an individual is poorer than others lower the satisfaction of an individual's life. There are many previous studies that support the negative valence of the relationship between the two variables. A study by Graham and Felton (2005) pointed out that perceived income inequality negatively affects on happiness. A study by Jang (2011), which

surveyed perceived income inequality and satisfaction in life, also explained that there was a significant association between the two variables.

### 3. Relationship between Income Inequality, Depression and Satisfaction in Life

As a result of stratification due to income inequality, differences in life opportunities appear (Cockerham, 2001; Payton and Moody, 2008), and a typical variable of such life opportunities is a health variable (Kim and Park, 1997; Gang and Jung, 2012). This means that income inequality creates social classes and health levels vary depending on social classes. In particular, the difference in depression caused by recent income inequality has recently been emphasized (Messias et al., 2011). Depression means depressed mood, or a state in which most activities are not fun, and can occur as symptoms such as weight loss, sleep problems, increased suicidal thinking, and increased sense of worthlessness (Srivastava, 2016). However, in general, despite the severe symptoms of depression, treatment is inadequate. According to a study by Nisar, Billoo and Gadit (2004), which surveyed the depression of women in fishing villages, 7.5% of respondents had signs of depression, however, only 13% used government facilities, and only 14% of respondents consulted psychiatrists.

The reason for the difference in depression due to income inequality seems to be that stress occurs when recognizing the negative reality caused by the increase in income inequality (Choi and Kim, 2014), and depression increases when such stress become excessive (Lee and Kim, 1999). In the case of the lower income class, when individuals feel income inequality deepens, they view their own situation negatively compared to others, and consequently become more depressed. Previous studies also support a significant association between the two variables; however, a study by Messias et al. (2011), which analyzed 235,067 adults, pointed out that income inequality is significantly associated with depressive symptoms. A study by van Deurzen et al., (2015), which analyzed 43,824 people in 23 countries, reported that depression was more severe among individuals in countries with high income disparities.

On the other hand, academia emphasizes depression as a main variable in mental health that promotes distortion. Beck (2008), who published the cognitive model of depression, pointed out that depression promotes cognitive vulnerability of an individual, resulting in distorted thinking. Thus, depression is not the only mechanism that causes various pathological phenomena, causes a negative understanding of an individual's life in general, and as a result, becomes the main mechanism for lowering the satisfaction in life. Previous studies also support the negative correlation between depression and satisfaction in life. A study by Srivastava (2016) found that there is a negative correlation between perceived depression and satisfaction in life of married women. A study by Baltaci and Karatas (2015) also reported a negative correlation between satisfaction in life and depression.

## Study Method

### 1. Study Model

The purpose of this study is to confirm the mediation effect of depression in the relationship between income inequality and satisfaction in life that female fisheries perceive. Through the examination of the results of previous studies, a research model as shown in Figure 1 was constructed.

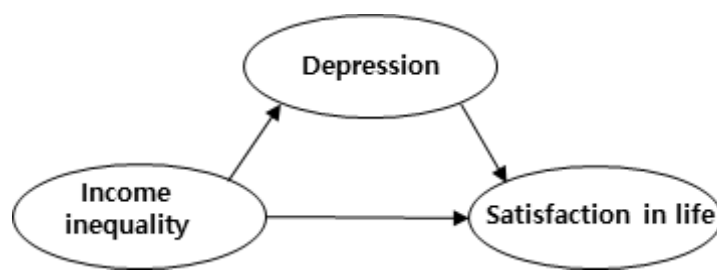


Fig 1. Research Model

## 2. Subject of Study and Study Method

This study was conducted by reassessing survey response data obtained in the research on “Life Condition and Support Plan for Female Fishermen in Jeonnam” conducted by Jeonnam Women's Plaza in 2016. At that time, the survey addressed female fishermen in Jeollanam-do, and the survey period was between July and September 2016. The survey was conducted in a face to face manner in which surveyor visited the area and surveyed. In this study, SPSS version 21.0 was used to analyze the data of 215 female fishermen produced at that time. First, frequency analysis and descriptive statistical analysis were conducted to understand the characteristics of the main variables. Second, the multicollinearity problem was examined through correlation analysis between independent variables. Third, the hierarchical regression analysis was conducted to estimate the mediating effects of depression between income inequality and satisfaction in life. Especially, the mediating effect was verified by the method presented by Baron and Kenny (1986), and the significance of the mediating effect was conducted by Sobel-test.

## 3. Measurement Tools

### 1) Satisfaction in Life: Dependent Variable

Satisfaction in life is a cognitive judgment of an individual's own life. To measure the satisfaction in life, Satisfaction with Life Scale developed in the research of Kim et al., (2005b) was used. A study by Kim et al., (2005b) measured the satisfaction of women in their lives in island area. The Satisfaction with Life Scale consists of seven questions, ranging from four points of ‘strongly agree’ to one point of ‘strongly disagree’, the higher the score, correlates to the higher the individual's satisfaction in life. Cronbach's Alpha in this study is reported to be .852.

### 2) Income Inequality: Independent Variable

Income inequality means increasing income disparities between individuals (Mckay, 2002; Glenn, 2003). The income inequality question that was used in the study by Ohtake (2004). To measure this among female fishermen, after passing the content validity test and explaining specific cases, the question has been modified to “Do you think that income inequality in Korea (the rich live better, and relatively I become poorer) has widened over the past five years?” (Ohtake, 2004; Choi and Kim, Requoted from 2014). The perceived income inequality question in Ohtake (2004) has also been verified in a study by Choi and Kim (2014). Besides, the perceived income inequality questions in this study consisted of a four point range. Four points indicated ‘strongly agree’ to one point ‘strongly disagree’, could then be understood as the higher the score, the higher the income inequality.

### 3) Depression: Mediating Variable

Depression means depressed mood or a state in which most activities are not fun (Srivastava, 2016). To measure this kind of depression, Depression Scale (Korean version CES-D) developed by Radloff (1977) and verified by Cho and Kim (1993) was used. The depression scale consisted of 20 questions, ranging from three points of 'mostly yes' to zero of 'extremely rare', the higher the score, the higher the depression. Some of the positive questions were given reverse scores as negative questions. Cronbach's Alpha in this study is reported to be .925.

## Study Result

### 1. General Characteristic of Respondents

The general characteristics of the respondents are as shown in Table 1. First of all, 61.4% of respondents were in their 40s or older and under 60s, who show higher response rate than 38.6% of those in their 40s or younger. The educational background of respondents was 71.5% of those who graduated from elementary school or higher, and higher than 28.6% of non-schoolers. The responses to economic problems were in the order of 46.0% of not serious, 24.2% of not serious at all, 24.2% of serious and 5.6% of very serious. Finally, the responses to health problems were identified in the order of 49.3% of serious, 23.7% of not serious, 14.4% of very serious, and 12.6% of not serious at all.

Table 1. General Characteristic of Respondents

Items		Number (percent)	Remarks
Ages	Less than 40	83 (38.6)	
	Over 40 – less than 60	132 (61.4)	
Educational Backgrounds	Non-schoolers	61 (28.5)	
	Graduated from elementary school or higher	153 (71.5)	
Economic Problems	Not serious at all	52 (24.2)	
	Not serious	99 (46.0)	
	Serious	52 (24.2)	
	Very serious	12 (5.6)	
Health Problems	Not serious at all	27 (12.6)	
	Not serious	51 (23.7)	
	Serious	106 (49.3)	
	Very serious	31 (14.4)	

### 2. Descriptive Statistics of Main Variables

The results of the descriptive statistics of main variables are as shown in Table 2. First of all, income inequality was 3.05 points (SD .75) between one point and four points. And depression was reported as 0.79 points (SD .49) between zero and three points. Besides, satisfaction in life was confirmed to be 3.61 points (SD .68) between 1 point and 4 points.



Table 2. Descriptive Statistics of Main Variables

Items	Score range	M (SD)	Minimum/Maximum value
Income inequality	1 point – 4 points	3.05 (0.75)	1/4
Depression	0 - 3 points	0.79 (0.49)	0/2.95
Satisfaction in life	1 point – 4 points	3.61 (0.68)	1.86/5

### 3. Correlations between Variables

The results of examining the multicollinearity problem between independent variables and the relationship between main variables are as shown in Table 3. The absolute value of the correlation coefficient between educational backgrounds, ages, income inequality, and depression was .640 or less, and there was no multicollinearity problem that would cause distortion of the results. Looking at the direction of the relationship between income inequality, which is an independent variable, and depression, which is a dependent variable, it was confirmed that there was a negative correlation between the independent and dependent variables as in previous studies.

Table 3. Correlations between Variables

Items	Educational Backgrounds	Ages	Income inequality	Depression	Satisfaction in life
Educational Backgrounds	-				
Ages	-.640***	-			
Income inequality	.087	-.095	-		
Depression	.079	-.060	.318***	-	
Satisfaction in life	.024	-.014	-.231***	-.319***	-

\*p<.05, \*\*p<.01, \*\*\*p<.001

Remark) Dummy: Educational backgrounds (1=Graduated from elementary school or higher)

### 4. Examining the Mediating Effect of Depression on the Relationship between Income Inequality and Satisfaction in Life

#### 1) Relationship between Income Inequality and Satisfaction in Life

The results of the analysis of the effect of income inequality perceived by female fishermen on the satisfaction in life are as shown in Table 4. Educational backgrounds and ages were found to be 1% explanation power of satisfaction in life, and the variable of educational backgrounds had a significant effect on the satisfaction in life. As a result of introducing income inequality under the control of educational backgrounds and ages, Model 2 showed that the explanation power of satisfaction in life increased to 5.5%, compared to 5.4% of Model 1. It was also reported that the variable of income inequality had a significant effect of  $\beta = -.235$  on the satisfaction in life.



Table 4. Relationship between Income Inequality and Satisfaction in Life

Items	Model 1		Model 2	
	B	$\beta$	B	$\beta$
Educational backgrounds	.000	.003*	-.001	-.013
Ages	.040	.026	.055	.036
Income inequality			-.214	-.235***
	(Constant) 3.568, (F) .062, (R <sup>2</sup> ) .001		(Constant) 4.261, (F) 4.108**, (R <sup>2</sup> ) .055	

\*p&lt;.05, \*\*p&lt;.01, \*\*\*p&lt;.001

Remark) Dummy: Educational backgrounds (1=Graduated from elementary school or higher)

## 2) Relationship between Income Inequality and Depression

The results of the analysis of the effects of income inequality perceived by female fishermen on the depression are as shown in Table 5. First, educational background and age showed 6% explanation power for depression in Model 1, and no significant influence was found. However, the significance in the model's goodness of fit of Model 1 was not found. Second, in Model 2, as a result of inputting variable of income inequality perceived by female fishermen under the control of educational backgrounds and ages, it was 10.4% for depression, compared with Model 1, showing a significant increase of 9.8%. It was also reported that the income inequality had a significant effect of  $\beta = -.314$  of the depression. Therefore, it can be estimated that the higher the level of income inequality perceived by female fishermen, the higher the depression.

Items	Model 1		Model 2	
	B	$\beta$	B	$\beta$
Educational Backgrounds	-.001	-.017	.000	.004
Ages	.074	.067	.059	.054
Income Inequality			.206	.314***
	(Constant) .775, (F) .673, (R <sup>2</sup> ) .006		(Constant) .105, (F) 8.096***, (R <sup>2</sup> ) .104	

\*p&lt;.05, \*\*p&lt;.01, \*\*\*p&lt;.001

Remark) Dummy: Educational backgrounds (1=Graduated from elementary school or higher)

## 3) Relationship between Income Inequality, Depression and Satisfaction in Life

The results of the analysis of the effects of income inequality and depression on the satisfaction of female fishermen in their lives are as shown in Table 6. First, educational background and age for satisfaction in life showed an explanation power of 1% in Model 1, however, no significance was found in the model's goodness of fit. Second, in Model 2, as a result of inputting variables of income inequality and depression perceived by female fishermen under the control of

educational backgrounds and ages, it was 12.3% for satisfaction in life, compared with Model 1, showing a significant increase of 9.8% compared to Model 1. It was also reported that the income inequality had a significant effect of  $\beta = -.149$ , and depression had a significant effect of  $\beta = -.277$ , respectively. Therefore, it can be estimated that the higher the income inequality and the depression, the higher the satisfaction in life.

Table 5. Relationship between Income Inequality, Depression and Satisfaction in Life

Items	Model 1		Model 2	
	B	$\beta$	B	$\beta$
Educational Backgrounds	.000	.003	-.001	-.011
Ages	.040	.026	.078	.051
Income Inequality			-.135	-.149*
Depression			-.382	-.277***
	(Constant) 3.568, (F) .062, (R <sup>2</sup> ) .001		(Constant) 4.302, (F) 7.405***, (R <sup>2</sup> ) .124	

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Remark) Dummy: Educational backgrounds (1=Graduated from elementary school or higher)

On the other hand, as a result of examining the mediating effect by the existing method presented by Baron and Kenny (1986), it was found that income inequality and satisfaction in life in the first stage (see Table 4), income inequality and depression in the second stage (see Table 5), income inequality in the third stage, and depression and satisfaction in life (see Table 6) were found to be significantly associated. In particular, it was found that the effects of income inequality on satisfaction in life were not absent/ by controlling depression which is a mediating variable in the relationship between income inequality(that is an independent variable) and satisfaction in life(that is a dependent variable) (see Table 6). Therefore, it can be understood that there is a partial mediating effect of depression in the relationship between income inequality and satisfaction in life perceived by female fishermen.

#### 4) Verification of Significance of Mediating Effect

Sobel-test was conducted to verify the significance of the partial mediating effect of depression. The verification results are as shown in Table 7. As a result of the verification, the Z value was -3.10 and the significance of the mediating effect of depression was confirmed in the relationship between income inequality and satisfaction in live at the level of  $p < .001$ .

Table 6. Significance of Mediating Effect

Route	z	p
Income inequality → Depression → Satisfaction in life	-3.10	.000

## Conclusion and Proposal

The purpose of this study is to confirm the mediating effects of depression in the relationship between income inequality and satisfaction in life perceived by female fishermen. As a result of the study, the partial mediating effect of depression in the relationship between income inequality and satisfaction in life was supported. This is consistent with previous studies that show a significant relationship between income inequality and satisfaction in life (Franini et al., 2001; Graham and Felton, 2005; Oishi et al., 2011; Xu, 2010; Jang, 2011; Schneider, 2012), income inequality and depression (Messias et al., 2011; van Deurzen et al., 2015), and depression and satisfaction in life (Baltaci and Karatas, 2015; Srivastava, 2016). This allowed the researchers to suggest that practical and policy interventions are needed to reduce income inequality and depression as a way to improve the satisfaction of female fishermen in their lives.

In general, ordinary women are more depressed than ordinary men. According to a study by Kim (2015), who analyzed data from the National Health and Nutrition Survey, the experience rate of depressive symptoms in men was 9.0% compared to 16.3% in women. Considering the results of this study, it can be estimated that female fishermen are not different from ordinary women who are not working in the fishing industry. Furthermore, this study identified a route of depression increasing due to perceived income inequality, thereby decreasing the quality of life. Therefore, it can be said that policy and practical efforts are needed to alleviate the depression of female fishermen.

First, we propose a system that can manage the depression of female fishermen. Fortunately, the government promised to establish the Female Fishermen Support Center in the 2017 Implementation Plan for Promoting Female Fishermen (Ministry of Marine Affairs and Fisheries, 2017). However, despite the basis of establishment of the Female Fishermen Support Center in the Female Farmers and Fishermen Promotion Act, there have been many cases in which the establishment of the Center was up to the will of the local government because the Plan based on the Act is not a compulsory. Therefore, it should be enforced the establishment of the Female Fishermen Support Center and guaranteed the financial resources to operate it. At that time, it is possible to build a system that can manage the depression of the female fishermen in the center. The point to be especially noted is that existing public health centers conduct examinations for depression, however, the examinations should overcome the limitations of the lack of a system linked to specialists in hospitals. Considering the fact that it could not lead to professional intervention in hospitals due to these limitations despite female fishermen experienced depression above the severity level, the system for managing the depression of female fishermen should basically include the task of establishing a cooperative system between the Female Fishermen Support Center and local hospitals.

On the other hand, the development of a depression prevention program and an education system should be established centering on the health and social welfare institutions in the areas where female fishermen live. Of course, health and social welfare institutions in some areas provide programs and education to prevent depression for women. However, it can be seen that the program and education services were less effective without considering the unique needs of female fishermen. Therefore, depression prevention programs and education that take into account the distinctiveness of female fishermen is necessary. According to the results of a 2016 study conducted by Jeonnam Women's Plaza, the service delivery system in fishing villages has not been established geographically compared to agricultural areas. Additionally, it is difficult for female fishermen to have the time to participate in the programs or education that they want because they are working in the middle of the night or early in the morning depending on the species of fish. This difference is in contrast when compared to agriculture, which works during the daytime hours taking advantage of

sunlight. To reflect these uniquenesses, an onsite visit is desirable for programs or education. However, even if visiting an island area, the time available for visiting with female fishermen is not sufficient, hence the needed cost of overnight stays for program leaders and educators should be guaranteed. Otherwise, a method can be adopted in which women create self-help groups (Heo, 2010; Park, 2010) and subsequently, professionals can visit and support the groups professionally at regular intervals. In particular, a cooperative relationship between the program or educational providers and female fishermen groups needs to be established. The female fishermen group can play a major role as a self-help group amongst the female fishermen, although it is insufficient to address the entirety of needs.

Other than the options already stated and dealing directly with the depression of female fishermen, there will also be ways to decrease depression by improving their life conditions which could likely result in less depression. For example, as 66 cities and towns nationwide declare their area as 'women-friendly city' and develop policies, systems, and physical facilities to respond accordingly, it is estimated that if a 'women-friendly island' is planned in the island areas (Jeonnam Women's Plaza, 2016; The Korean Government, 2017), the overall settlement consciousness of women will be improved, and this change will then have a positive effect on decreasing depression of female fishermen.

We also propose various attempts to support leisure activities of female fishermen in the public and private sectors such as yoga. The depression of female fishermen has shown to increase due to the process of chronic pain occurrence (limb numbness, back pain, shoulder soreness, etc.) and subsequent pain relief injections (Gangwondo Women and Family Research Institute, 2012; Jeonnam Women's Plaza, 2016).

The above proposals and associated efforts are not superior to alleviating income inequality. The conclusion of this study is that intervention in female fishermen's depression should be made a first priority, or the establishment of an equal or equitable income structure needs to be established, which can resolve dissatisfaction with income when compared to others. This income structure needs to be conducted in parallel with the governmental efforts.

Despite the significance of this study, the limitations of this study are as follows. First of all, despite the existence of various third variables in the relationship between income inequality and satisfaction in life, only the variables of depression were analyzed. Therefore, various social and economic variables should also be considered in subsequent studies. Furthermore, since this study surveyed female fishermen in some areas, it is difficult to represent all female fishermen, hence subsequent studies using probability sampling should be conducted in order to have a larger representational data sampling.

## Endnotes

1. This paper was written with the support of raw data of Jeonnam Women's Plaza, a juridical foundation (Research Report 2016-04), "Life Conditions and Support Plan for Female Fishermen in Jeonnam".

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