The moderating effect of spiritual well-being on the association between depressive state and living arrangement in the elderly in rural Okinawa

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**Objective**: The aim of this study was to verify the role of spiritual well-being as a moderator of the effect of living arrangement on depressive state in the elderly.

**Methods**: We conducted a cross-sectional study using semi-structured interviews in Okinawa on 2010. Four hundreds thirteen (165 men, 248 women) participants were asked about 5-item Geriatric Depression Scale (GDS-5) as dependent variable, living arrangements (living alone or living with others) as independent variable, spiritual rating scale for elderly as mediating variable, and demographic and socioeconomic variables as control variables. The main and interaction effects were assessed using hierarchical multiple regression and simple slope analyses.

**Results**: The proportion of elderly who living alone was 26.6% (n=110), and they were significantly higher scores of GDS-5 than the elderly who living with others (P<0.001). Significant negative correlation was found between depressive state and spiritual well-being (r=−0.27, P<0.001), and the result indicated that the elderly with higher spiritual well-being were lower depressive state. Results of hierarchical regression analysis showed that the correlation between living arrangement and spiritual well-being was positively associated with increased risk for depressive state (β =0.10, P = 0.037). Simple slope analyses revealed that the elderly who living alone had significantly higher depressive state scores than those who living with others only in low spiritual well-being (P=0.002), but not in high spiritual well-being (P=0.445).

**Conclusions**: Our findings suggest that spiritual well-being might play an important role in preventing the elderly who living alone from depression, and interventions aimed at promoting spiritual well-being in the elderly who living alone may lead to improvements in mental health.

**Key words**: elderly who live alone, depressive state, spiritual well-being, rural area.

**I Introduction**

Japan is one of the most rapidly aging countries in the world. The proportion of elderly individuals (aged ≥65 years) in Japan is currently about 23.3%, and is expected to rise to 30.0% by 2030 and 39.9% by 2060, when 1 of every 2.5 people will be elderly¹. This increase in the elderly population will be accompanied by an increasing number of those who live alone. In fact, the number of elderly who lived alone rose from 0.88 million (7.8% of the elderly population) in 1980 to 4.80 million (15.8%) in 2010², and is expected to reach 7.17 million (19.4%) by 2030³.

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Compared with the elderly who live with others, the elderly who live alone tend to have higher functional levels of activities of daily living; however, they also tend to have poorer self-rated health\(^4\), a diminished sense of life satisfaction\(^5\), and impaired cognitive function\(^6\), along with a higher risk for dementia\(^7\). In addition, correlations have been reported between living arrangement (living alone or with others) and lonely death, suicide attempts, and depression\(^8\). These social issues are prevalent not only in Japan, but also in other countries around the world. Based on the disability-adjusted life year, a measure developed by the World Health Organization, depression is projected to become the second most burdensome disease worldwide by 2020, after coronary heart disease\(^9\). Therefore, to promote a higher quality of life (QOL) and prevent an increase in the incidence of suicide in a progressively aging society such as Japan, there is an urgent public health need to reduce the prevalence of depression among the elderly, especially those who live alone.

As they age, the elderly encounter developmental issues with “loss” and “integration of life experiences”. Furthermore, various experiences of physical, psychological, or social loss have been reported as causes of depression, including physical illness or injury, death of a spouse, dissolution of relationships with others, diminished social roles, and financial difficulties\(^10\-12\). In particular, for elderly individuals living alone, factors reported to be associated with depression include psychological factors such as anxiety and loneliness\(^12\,13\), social factors such as decreased social support\(^14\); and social networks\(^15\,16\) and other socioeconomic factors such as subjective economic status and income\(^17\). Spiritual well-being may attenuate the adverse effects of physical, psychological, and social losses, because it allows the elderly to accomplish developmental tasks, and may prompt them to seek significance in life and to accept their life\(^18\).

The concept of spiritual well-being is different from a country’s social and cultural background, so it is a difficult concept to define. Ogusu\(^19\) concluded that spiritual well-being in Japan is inherent to human nature and stimulated by critical junctures at life events, and that it is related to the self, others, and a presence that exceeds the power of the self. According to Ogusu\(^19\), a characteristic of spiritual well-being in Japan is exploring “the meaning and purpose of life” and “the meaning of suffering and death”. Spiritual well-being therefore is one of the most important concepts in a healthy human life. The elderly tend to think about death and the significance of their own life as an inevitable process of decline; this is based on a realistic view that involves the gradual decline of physical function, bereavement experiences due to the deaths of family and friends, and withdrawal from social roles. It has been pointed out that spiritual well-being plays an important role in this process\(^20\). Previous studies have reported that spiritual well-being is associated with depressive symptoms and anxiety\(^21\), and that it alleviates depression by acting as a stress-coping mechanism promoting benefit-finding and positive reinterpretation with respect to disease\(^4,22,23\). It has also been reported that daily spiritual experiences such as social interactions with others (sharing feelings of a connection and receiving support), gratitude, compassion, and inner peace can affect mental health\(^24\). Importantly, spiritual factors related to depression in the elderly have been studied in Western countries but not in Japan. Moreover, the moderating effect of spirituality on the relationship between living arrangement (living alone or with others) and depression remains unclear. Therefore, the aim of this study was to clarify the moderating effect of spiritual well-being on the association between a depressive state and living arrangement in the elderly.
Subjects and methods

We conducted a cross-sectional study using semi-structured interviews in Village A, Okinawa, Japan, during November and December 2010. Village A had 1,623 households and a population of 3,417 (1,040 elderly [30.9%]), with an average lifespan of 78.3 years for men and 86.4 years for women. Regarding the cultural background, praying (ugami), which may affect the spiritual well-being of the elderly, has remained and been designated as a significant intangible folk cultural asset. Among the 1,040 elderly residents, 115 who lived in facilities for the elderly or who were unable to communicate were excluded from the study. The remaining 925 were identified from the Basic Resident Register using a 50% stratified random sampling method by sex and 5-year age stratum from each region. A total of 476 elderly individuals (187 men, 288 women) were selected, of whom 413 (165 men, 248 women) answered all interview questions and were included for analysis.

Participants were asked about the following demographic and socioeconomic variables: sex; age; education level (≤6 years or >6 years); marital status (married, unmarried, divorced, or widowed); spouse (yes or no). These variables, which are potential confounders, served as control variables.

Depressive state was evaluated using the 5-item Geriatric Depression Scale (GDS-5). The GDS-5 has been found to be as effective as the standard 15-item GDS scale in depression screening. Response categories were yes (1) or no (0), the total score range was between 0 (good) and 5 (worst), and Cronbach’s alpha was 0.70.

Social interaction was assessed using the following two questions: “How often do you have the opportunity to meet with your friends?” and “How often do you have the opportunity to meet with family and relatives?” Responses were categorized into two groups as follows: “almost every day” and “two or three times a week” was considered high social interaction (1), and “less than once a week” was considered low social interaction (0).

Reception of social support was measured with the question “When you are sick and need someone to take care of you for a few days, do you know anyone who is willing to provide such care?”, and provision of social support was measured with the question “Do you know anyone who wants to receive care?” Response categories for each social support question were yes (1) or no (0).

For the evaluation of spiritual well-being, we used a spirituality rating scale for Japanese elderly that has been validated by confirmatory factor analysis. The Spirituality Rating Scale for Japanese Elderly is composed of 18 items and the following 5 subcategories: “review of one’s own life”; “relationships with others”; “interest in the transcendent”; “pursuing one’s own being”; and “directing one’s mind to the future”. Respondents were asked to reply on a 5-point Likert scale from disagree (1) to agree (5), with a high total score indicating good spiritual well-being. Cronbach’s alpha was 0.91, which indicated high internal consistency.

Statistical analysis

To investigate the association between depressive state and demographic variables, social interaction, and social support, statistical analysis was conducted using unpaired t-tests, one-way analysis of variance, and Pearson’s correlation coefficient. The main and interaction effects of spiritual well-being and living arrangement on depressive state were assessed using hierarchical multiple regression. It should be noted that multicollinearity is sometimes a problem when interpreting the results of a hierarchical multiple regression model. High multicollinearity makes it difficult to distinguish the various effects of independent variables. There-
Therefore, we assessed correlations among independent and covariate variables to examine multicollinearity using Pearson’s or Spearman’s correlations. As a result, moderate or strong significant correlations were found between living arrangement, marital status, and spouse ($r_{xy} = 0.44 ~ 0.74$, $P<0.001$). We therefore eliminated marital status and spouse from the analysis. In model 1 of the hierarchical multiple regression, to reveal the correlation between depressive state and living arrangement, depressive state was the dependent variable, living arrangement was the independent variable, and sex, age, education level, social interaction with friends, social interaction with relatives, reception of social support and provision of social support were included as covariates. In model 2, to estimate the main effects of spiritual well-being and living arrangement ($0$=living alone, $1$=living with others).
The variables were input into the model as independent variables using the mean-centered method that is one of the recommended methods on hierarchical multiple regression to prevent a high degree of multicollinearity. In model 3, to estimate the moderating effect of spiritual well-being, the variables were input into the model as independent variables using the mean-centered method that is one of the recommended methods on hierarchical multiple regression to prevent a high degree of multicollinearity. In model 3, to estimate the moderating effect of spiritual well-being, the variables were input into the model as independent variables using the mean-centered method that is one of the recommended methods on hierarchical multiple regression to prevent a high degree of multicollinearity.

### Table 2: Relations between GDS-5 score and Sociodemographic characteristics and spiritual well-being

|                     | Mean | SD  | t-value | P-value |
|---------------------|------|-----|---------|---------|
| **Sex** a           |      |     |         |         |
| Male                | 1.2  | (1.4)| 0.68    | .496    |
| Female              | 1.1  | (1.2)|         |         |
| **Age** b           |      |     | 0.12    | .016    |
|                     | r=0.12|     |         |         |
| **Marital status** c|      |     | F-value |         |
| Married             | 0.9  | (1.2)| 6.50    | <0.001  |
| Unmarried           | 1.7  | (1.6)|         |         |
| Divorced            | 1.4  | (1.2)|         |         |
| Widowed             | 1.4  | (1.4)|         |         |
| **Spouse** a        |      |     |         |         |
| Yes                 | 0.9  | (1.2)| -3.95   | <0.001  |
| No                  | 1.4  | (1.4)|         |         |
| **Living arrangement** a|  | |         |         |
| Living alone        | 1.5  | (1.5)| 3.34    | .001    |
| Living with others  | 1.0  | (1.2)|         |         |
| **Education level** a|  | |         |         |
| ≤6 years            | 1.6  | (1.4)| 3.09    | .003    |
| >6 years            | 1.0  | (1.3)|         |         |
| **Social interaction with friends** a|  | |         |         |
| No                  | 1.6  | (1.5)| 3.54    | .001    |
| Yes                 | 1.0  | (1.2)|         |         |
| **Social interaction with relatives** a|  | |         |         |
| No                  | 1.2  | (1.4)| 0.71    | .481    |
| Yes                 | 1.1  | (1.3)|         |         |
| **Reception of social support** a|  | |         |         |
| No                  | 1.4  | (1.4)| 1.37    | .177    |
| Yes                 | 1.1  | (1.3)|         |         |
| **Provision of social support** a|  | |         |         |
| No                  | 2.0  | (1.5)| 4.55    | <0.001  |
| Yes                 | 1.0  | (1.2)|         |         |

**Spiritual well-being** b

|                     | r=-0.27 |  | <0.001 |

**NOTE.** a: Unpaired t-test, b: Pearson’s correlation coefficient, c: one-way analysis of variance, SD: standard deviation, r: correlation coefficient, n=413
and living arrangement, their cross-product interaction term was incorporated. To examine the significant interaction between spiritual well-being and living arrangement, simple slope analyses were conducted by dividing the total spiritual well-being scores into the following two levels: mean – SD (low) and mean + SD (high). The reliability of these scales was tested by computing Cronbach’s alpha coefficients. P values < 0.05 were considered statistically significant. All analyses were performed using SPSS20.0J for Windows (SPSS Japan Inc., Tokyo, Japan).

IV Ethical consideration

Before the survey began, this study was approved by the Village A government, including the mayor and 17 ward leaders after they were informed about the study procedure and ethical issues. All participants received written and spoken explanations of the research aims, methods, privacy, confidentiality, management of data, and intention to publish. Written informed consent to participate in the study was obtained from all participants. This study was conducted in accordance with the Declaration of Helsinki and the Ethical Guidelines for Epidemiological Research published by the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labour and Welfare.

V Results

The demographic characteristics of the participants are shown in Table 1. The proportion of elderly who lived alone was 26.6% (n = 110). Compared with the elderly who lived with others, the elderly who lived alone had a higher proportion of women (66.4%), widowed (58.2%), and no spouse (85.5%); higher mean age (79.9 ± 8.4 years); and a lower proportion of high education level (76.4%), reception of social support (78.2%), and provision of social support (74.5%). Social interaction with friends and relatives was reported by approximately 76% and just over 50% of elderly who lived alone and those who lived with others, respectively.

The associations between depressive state and demographic variables, social interaction, social support, and spiritual well-being are shown in Table 2. Significantly higher scores, indicating a worse depressive state, were associated with higher age (r = 0.12, P < 0.01), marital status (P < 0.001), no spouse (1.4 ± 1.4, P < 0.001), living alone (1.5 ± 1.5, P < 0.001), low education level (1.6 ± 1.4, P < 0.003), low social interaction with friends (1.6 ± 1.5, P < 0.001), no provision of social support (2.0 ± 1.5, P < 0.001), and lower spiritual well-being (r = −0.27, P < 0.001). No associations were found between depressive state and sex, social interaction with relatives, or reception of social support.

Results from hierarchical regression analysis on the association between living arrangement and spiritual well-being with depressive state are shown in Table 3. In model 1, the significant correlation between depressive state and living arrangement was found, and living arrangement and the covariate variables accounted for 12.7% of the unique variance (R² = 0.127, adjR² = 0.109, P < 0.001). In model 2, a significant main effect was demonstrated for living arrangement (β = −0.10, P = 0.038) and spiritual well-being (β = −0.21, P < 0.001). Living alone and decreased spiritual well-being were associated with higher depressive state scores. Model 2 accounted for 16.4% of the unique variance (R² = 0.164, adjR² = 0.146, P < 0.001), and significantly increased the overall variance explained in model 1 by 3.8% (P < 0.001). Results of analyses in model 3 indicated that the correlation between living arrangement and spiritual well-being was positively associated with increased risk for depressive state (β = 0.10, P = 0.037).
### Table 3  Results of three-step hierarchical regression analysis to test moderating effect of spiritual well-bening on the relationship between living arrangement and depressive state

|                          | Model 1      | Model 2      | Model 3      | Model 4      |
|--------------------------|--------------|--------------|--------------|--------------|
|                          | B | SE | beta | P-value | B | SE | beta | P-value | B | SE | beta | P-value |
| Sex                      | -.07 | .13 | -.03 | .583 | .01 | .13 | -.00 | .969 | .03 | .13 | .01 | .839 |
| Age                      | .02 | .01 | .10 | .062 | .02 | .01 | .12 | .029 | .02 | .01 | .12 | .019 |
| Education level          | -.27 | .18 | -.08 | .139 | -.27 | .18 | -.08 | .125 | -.24 | .18 | -.07 | .173 |
| Social interaction with friends | -.53 | .15 | -.17 | <.001 | -.42 | .15 | -.14 | .005 | -.42 | .15 | -.14 | .005 |
| Social interaction with relatives | -.01 | .13 | .00 | .930 | .00 | .13 | .00 | .988 | .01 | .13 | .00 | .958 |
| Reception of social support | -.18 | .23 | -.04 | .430 | -.20 | .22 | -.05 | .367 | -.27 | .23 | -.06 | .229 |
| Provision of social support | -.81 | .22 | -.20 | <.001 | -.66 | .21 | -.16 | .002 | -.58 | .22 | -.14 | .007 |
| Living arrangement       | -.36 | .15 | -.12 | .014 | -.30 | .14 | -.10 | .038 | -.27 | .14 | -.09 | .059 |
| Spiritual well-being     | -.03 | .01 | -.21 | <.001 | -.03 | .01 | -.23 | <.001 | -.03 | .01 | -.23 | <.001 |
| Living arrangement × Spiritual well-being | .03 | .01 | .10 | .037 | .127 | <.001 | .164 | <.001 | .173 | <.001 |
| $R^2$                    | .109 | .146 | .153 | .038 | .009 | .009 | .009 | .009 | .009 | .009 | .009 |

**NOTE.** n = 413. B = unstandardized coefficients, beta = standardized coefficients, $R^2$ = explanation rate, Adj $R^2$ = Adjusted explanation rate, $\Delta R^2$ = change in explanation rate, each step. Sex (0: Men, 1: Women). Education level (0:<6 years, 1:>6 years). Social interaction with friends (0: No, 1: Yes). Social interaction with relatives (0: No, 1: Yes). Reception of social support (0: No, 1: Yes). Provision of social support (0: No, 1: Yes). Living arrangement (0: Living alone, 1: Living with others). Living arrangement × Spiritual well-being = the product (interaction) term of the number of Living arrangement and Spiritual well-being scores.
Model 3 accounted for 17.3% of the unique variance (R² = 0.173, adjR² = 0.153, P < 0.001), and significantly increased the overall variance explained in model 2 by 0.9% (P = 0.037).

Finally, the results of simple slope analyses (Figure 1) showed that the elderly who live alone had significantly higher depressive state scores than those who live with others in low spiritual well-being (mean – SD)(P = 0.002). On the other hand, in high spiritual well-being (mean + SD), a non-significant difference in depressive state score was found between the elderly who live alone and who live with others (P = 0.445).

VI Discussion

The present study aimed to investigate the moderating effect of spiritual well-being on the association between depressive state and living arrangement (living alone or with others) in the elderly. The results revealed that the elderly who living alone had significantly higher depressive state scores than those who living with others only in low spiritual well-being, but not in high spiritual well-being. This suggests that spiritual well-being is likely to be effective in buffering the depressive state associated with living alone.

The significant correlations between depressive state and demographic variables such as age, education level, social interaction with friends, and provision of social support found in this study are consistent with results from previous studies in which higher age, lower education level, lack of social interaction, and lack of social support were found to be significantly associated with higher prevalence of depression or depressive state. Although no significant association was found between depressive state and other demographic variables such as sex, social interaction with family and relatives, and reception of social support in the present study, a significant association was observed between depressive state and all demographic variables in previous studies, and the possibility of confounders needs to be considered. Therefore, in hierarchical multiple regression analysis, all demographic variables were used as control variables.

![Figure 1](image.png)

**Figure 1** Interaction plot illustrating the moderating effect of spiritual well-being.

*Note.* The term 'low' refers to –1 standard deviation from the average scores and 'high' refers to +1 standard deviation from the average scores on the given spiritual well-being score.
The significant difference observed in the relationship between living arrangement and depressive state was consistent with results from previous studies, and the elderly who lived alone were found to have a more depressive state than the elderly who lived with others. Some possible explanations for this have been proposed in previous studies. That is, Psychological stress resulting from loss experiences (especially divorce), exacerbation of loneliness, and diminished self-esteem and life satisfaction associated with solitude could lead to depression. For example, elderly people who live alone have limited social relationships, and this reduces social integration, leading to less social support and feelings of isolation. Older Korean people living alone have also been reported to have lower self-esteem and life satisfaction than those living with others, which in turn leads to a higher prevalence of depression. In this manner, the situation of living alone has a significant impact on the psychological aspects and social roles of the elderly, and it can also be expected to affect mental health and QOL.

Furthermore, significant interaction effects were observed in the depressive state scores between spiritual well-being and living arrangement after controlling for confounders, and depressive state scores were significantly higher in those who lived alone than those who lived with others only in low spiritual well-being. In other words, spiritual well-being may have a moderating effect on depressive state associated with living alone. In fact, Bonelli et al showed that of 444 studies conducted from 1962 to 2011 on the association between spiritual well-being and depression, about 63% reported that subjects with greater spiritual well-being or stronger religious beliefs had a lower prevalence of depression, faster relief from depressive symptoms, or decreased depression severity in response to spiritual intervention, which suggested that spiritual well-being, religious beliefs, and associated practices, such as participating in church services, and praying for oneself, family, friends and others, may help people cope with stressful life circumstances, may provide meaning and hope to their lives, and may enable depressed persons to be surrounded by a supportive community. For example, a prospective cohort study involving 135 relatives and close friends of patients with terminal illnesses in London reported that those with strong spiritual beliefs seem to resolve their grief more rapidly and completely after the death of a family member or close friend than those with no spiritual beliefs. That study therefore concluded that spiritual beliefs may enhance an existential framework in which grief is mitigated more readily. Furthermore, spiritual activities such as prayer and being prayed for may also reduce the sense of isolation.

As previously described, not only cross-sectional but also many longitudinal and interventional studies have elucidated the association between depression, living arrangement, and spiritual well-being in Western countries, and the mechanism underlying the association between spiritual well-being and depressive state may be what we have described above. However, unlike in Western, most elderly people in our study area do not practice a particular religion, and almost all of them practice ancestor worship. Therefore, it is difficult to directly adapt the interventions conducted in other countries. In our study area, the spiritual culture of elderly people is to pray to their ancestors for safety, health, and development for themselves, their family, and their friends, and this has long been incorporated into their lives. As reported in a previous study, spiritual culture and practice may improve depression in the elderly, especially those who live alone in Japan. As Ogusu points out, it is possible that these cultural customs help to re-es-
tablish a sense of roles within the social system, which tends to be lost during ones’ old age, and help to promote “meaning and purpose of life” and the “meaning of suffering and death”. Additionally, elderly people in Okinawa, including the participants in this research, will become aware of the self that is driven by the transcendent force through the experiences of war. In the interviews, the participants were seeking to find meaning in life and death of others and in their own lives and the courses they have taken. Their responses included: “why am I (are we) alive while so many people such as family members, relatives, and friends were killed?”; “the fact that I am (we are) alive must indicate that I (we) have some role to play or mission to accomplish.” It is speculated that acknowledging life courses of the elderly through life review intervention will help them become aware of the meaning of life, their roles in society and re-definition of self. This will possibly contribute to increasing their spiritual well-being. In fact, the previous study revealed that short term life review intervention on cancer patients improved spiritual well-being\textsuperscript{45}, and life review and reminiscence improved depressive symptoms in elderly people\textsuperscript{46}. Thus, there is an urgent need to develop an intervention program rooted in spiritual culture and practice for the elderly who live alone.

\section*{VII Limitations}

This study has some limitations. First, the cross-sectional design makes it impossible to reveal causal associations between depressive state and living arrangement, and depressive state and spiritual well-being. Although 70 prospective studies which clarified causal associations between depression and religiosity/spirituality were there, there is no prospective study conducted in our country as long as we know. Therefore, longitudinal study is needed to confirm causal associations between those factors in Japan. Second, the study was conducted in a rural area in Okinawa, so the generalizability of the present findings might be limited. According to a recent population census in Japan\textsuperscript{47}, the proportion of elderly who live alone is declining in rural areas and drastically increasing in urban areas, and therefore problems of depression associated with the social isolation of the urban elderly living alone may become more serious. The socio-cultural context of urban areas is different from that in rural areas, and so the association between depression and spiritual well-being in elderly people who live alone in urban areas requires investigation. Third, the spirituality rating scale used in this study was developed for the elderly living in Japan, and is not specific to particular religions. The scale has previously been shown to have construct validity, internal validity, and reliability, and high reliability was observed in the present study, too. On the other hand, it is hard to say that a concrete definition of spirituality has been established in Japan. Further work is needed to establish a definition of spirituality in Japan in cooperation with other areas, including medical fields, cultural anthropology, and psychology. Forth, the score of GDS-5 was skewed to 0 (non-depressive state), because the participants on the present study were comparatively healthy community-dwelling elderly. Therefore it should be carefully interpreted the results, and it might be necessary to analyze by dichotomizing the score. Finally, this study revealed the positive effect of spirituality on depressive state in the elderly who live alone, which is in contrast to some previous studies that have reported a negative effect. Maselko et al. found that higher levels of religious/spiritual well-being were associated with a 1.5-times higher risk for depression in the New England Family Study cohort, and they concluded the reason for this negative association was that religious and
spiritual beliefs may increase feelings of guilt\(^{(8)}\). The results of our study, which was conducted with 718 elderly residents of Okinawa, suggested that spiritual well-being enhances both emotion- and avoidance-focused coping, with the former promoting a decrease in depression and the latter leading to depression\(^{(9)}\). While further intervention studies on spiritual well-being for the elderly living alone are required, it is also keep such negative effects in mind and to investigate the reasons for these negative effects in greater detail.

\section*{Conclusion}

Despite these limitations, our results demonstrated the importance of spiritual well-being in relation to the depressive state in the elderly who live alone. To the best of our knowledge, this is one of the first studies to investigate the moderating effects of spiritual well-being on the association between depressive state and living arrangement in Japan. Our findings suggest that interventions aimed at promoting spiritual well-being in the elderly may lead to improvements in mental health.

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(Received 5.22.2015; Accepted 8.11.2015)
The moderating effect of spiritual well-being on the association between depressive state and living arrangement in the elderly in rural Okinawa

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Jpn J Health & Human Ecology, 82(2)59–71, 2016

目的: 本研究の目的は、地域在住高齢者のスピリチュアルウェルビーニングが独居に伴う抑うつ状態に対する緩衝効果を検証することである。

対象と方法: 本研究は、2010年に沖縄県の地域在住高齢者413名（男性165名、女性248名）を対象に半構成的質問紙調査を実施した。質問内容は、基本属性、居住形態（独居または同居）、抑うつ状態の評価には5-item Geriatric Depression Scale (GDS-5)およびスピリチュアルウェルビーニングの評価にはSpiritual rating scale for elderlyを設問した。主効果および交互作用の分析には階層的重回帰分析と単純傾斜分析を使用した。

結果: 本研究対象者のうち、110名（26.6%）が独居高齢者であり、同居者に比較して、GDS-5得点が有意に高値であった（P=0.001）。また、抑うつ傾向とスピリチュアルウェルビーニングとの関連において、負の有意な相関を認め（r=−0.27、P<0.001）、スピリチュアルウェルビーニングの高い高齢者ほど抑うつ傾向が低くなるという結果が得られた。階層的重回帰分析と単純傾斜分析の結果、居住形態とスピリチュアルウェルビーニングの交互作用項と、抑うつ傾向と有意な交互作用を認め、スピリチュアルウェルビーニングが低値である場合のみ、独居高齢者の方が同居高齢者に比べて抑うつ傾向が有意に低値であるという結果が得られた。

結論: 本研究結果より、スピリチュアルウェルビーニングが独居に伴う抑うつ状態を緩和することが明らかとなり、スピリチュアルウェルビーニングの向上を目的とした働きかけが独居高齢者のメンタルヘルス改善の一助となる可能性が示唆された。