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The Association between Religious Activities Participation and Physical Function in Indonesian Elderly

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Abstract: Physical function difficulty is a big concern in the elderly globally. Previous studies highlighted the inconclusive findings regarding the elderly's religious involvement and physical function disability. Furthermore, spiritual study is still scarce in Asian settings. The study examined the association between religious involvement *(majelis taklim)* and physical disability. This cross-sectional observational study harnessed the fifth wave of the Indonesian Family Life Survey (IFLS). Katz Index was used to measure the occurrence of physical disability. Participants aged ≥ 60 years were involved (n = 1799), and 18% reported having a physical function disability. Binomial logistic regression showed that in the unadjusted model, participation in *majelis taklim* (OR = 0.86, p <0.01) and involvement in the religious program (OR = 0.72, p<0.05) were significantly associated with having no physical disability. Meanwhile, the lower frequency of participation in *majelis taklim* was significant with physical disability in the adjusted model (OR = 0.89; 95%, p<0.05). Participation in religious activities was associated with a lower probability of having a physical function disability in the elderly. The result of the study can be a potential consideration for caregivers, health workers, and policymakers to maximize the religiosity involvement program for reducing the risk of physical disability among the elderly.

Keywords: elderly; physical function; physical disability; religious program; spirituality

INTRODUCTION

World Health Organization (WHO) highlighted that the present rate of population aging exceeds that of prior epochs. The WHO also estimated that 8 of 10 elderly would be concentrated in low- and middle-income countries.[1] Indonesia was included in the list. Indonesia exemplifies the global phenomenon of an aging population as the fertility rate has declined and the number of older citizens continues to rise.[2,3] In 2021, or 10.82% of the population, Indonesia entered a period of aging demographics. The aging population of Indonesia, defined as those aged 60 and older, is projected to reach 20% of the total population in 2045. It will still give Indonesia the most senior citizens in the Southeast Asia region.[4] The demographic shift raises concerns about this population's health and well-being, particularly regarding physical function impairment.

Physical disability is one of the paramount issues in the elderly, especially in the aspect of well-being and health. The physical function difficulty and physical activity may have a bidirectional association. Individuals with a physical disability are less likely to achieve adequate physical activity intensity, whereas physical activity is related to healthy aging status.[5,6] Furthermore, there is a potential risk of diminished participation in community activities among older people with limited mobility. It will affect feelings of isolation and increase the risk of depression.[7] Irish study underlined the association between physical function difficulty and the increasing chronic disease number or multimorbidity in respondents aged 50 years and older.[8]

A longitudinal study raises concerns related to physical disability in the elderly. The proportion of Indonesian elderly complaining of physical disability was estimated from 6.7% to 42.3% from 2007 to 2014,

respectively.[9] Previous findings underlined the associated factors of physical function difficulties in the elderly population, such as being older, inadequate nutrition, living in rural areas, insufficient physical activity, high Body Mass Index (BMI), and lower level of participation in social programs.[10,11] Interestingly, religious notions in the elderly acted as a protection against physical disability in some recent findings, primarily related to the frequency of participation and affiliation.[12–15] Nonetheless, we found inconclusive results related to the effect of religiosity, as some findings mentioned insignificant effects of religiosity for tackling the odds of elderly' disability.[16] The growing interest related to religiosity in older people is rising. However, the study is prevalently concentrated in high-income countries. A study in an Asian setting is needed as the high number of individuals aged 60 years and older is highly concentrated in Asia, specifically in Indonesia.

As the nation with the world's largest Muslim population, religion is an extensive discussion in Indonesia. Compared with several activities, a religious-based program was the most common among older Indonesian adults.[17] Muhammadiyah and Nahdlatul Ulama were the most famous Islamic affiliations in all age groups, including the elderly. In previous findings, participation in Islamic associations was also associated with positive well-being.[18] The affiliation could enable the elderly to increase their involvement in community programs, such as *majelis taklim* (religious assembly), praying groups, and social programs. However, the geriatric study on religious affiliation and physical disability in older people is still under-studied. Therefore, the objective of this study was to examine the association between spiritual participation variables and the presence of activities of daily living (ADL) or physical disability among the Indonesian elderly.

MATERIAL AND METHOD

This cross-sectional observational study uses the fifth wave of the ongoing Indonesian Family Life Survey (IFLS). The IFLS is the only prospective survey in Indonesia measuring the same household from 1993 until 2014 regarding health, economic, social, anthropology, and well-being. The first to the fifth wave was prospectively conducted from 1993, 1997, 2000, 2007, and 2014, respectively. However, the current research was focused on the setting of 2014 of the wave 5 IFLS. The dataset used anonymous data for the user or researcher to achieve ethical concerns. In 1993-1994, the IFLS used a multi-stage random sampling to ensure Indonesian representativeness. The household respondents comprised 83% of the total Indonesian population. The enumeration area was in 13 Provinces of 27 Provinces in Indonesia by the 1993 Indonesia setting. The trained data collector followed every respondent from 1993 until now. For data collection, the trained enumerator implemented face-to-face interviews and utilized a computer-assisted personal interview (CAPI) for data collection. The IFLS was conducted by the RAND Corporation and collaborated with some Indonesian institutions: Universitas Indonesia, Universitas Gadjah Mada, and Survey METRE. For the inclusion criteria, we focused on Indonesian elderly aged 60 years and older, Muslim, and participants responding to all the variables related to religiosity-related socio-demography and health issues. We excluded the missing data and proxy data in our analysis. Proxy data was defined as information gathered from the non-targeted participants, such as family and relatives. The participants involved in the current study were 1799 elderly.

Physical function was measured using the index of activity daily living (ADL), which is used widely, including in the elderly population. According to Indexed by Katz, physical function, or ADL, in older can be focused on independence in bathing, dressing, toileting, transferring, continence, and feeding.[19] The IFLS 5 instrument measured physical function using the six-item index: the ability to dress without help; bathe; bed transferring; feed; and control urination and defecation. The responses were "easily," "with difficulty," "can do with help," and "unable to do it." We treated and recorded the response as binary, with no difficulty (easily) and with difficulty (others). The variable was named physical function difficulty with the binary response (yes/no). The score of Cronbach's Alpha in the ADL item was 0.825, indicating highly acceptable internal consistency for the measurement. The current measure was also widely used in some prior research.[20,21]

Regarding the religious-based variables, we defined it as an individual role in three aspects, such as (1) the frequency or intensity of participation in *majelis taklim,* (2) participation in the religious program in the last year (yes/no), and (3) involvement in the Islamic affiliation or tradition. Participation in *majelis* taklim was defined as "Did you attend/participate in *prayer/ religious meeting (majelis taklim) in the past 12 months?* The response was 1 to 5 (1 = Yes, more than once a week; 2 = Yes, at least once a week; 3 = Yes, at least once a month; 4 = Yes, less than once a month; 5 = No). We reserved the response as higher scores, indicating a higher frequency of participation. Then, we named it a variable of frequency of participation in *majelis taklim*. Second, we used the participation of the elderly in the religious program in the last year (yes/no). As Indonesian Islamic affiliation has a significant role in society, we used the variable whether the participants

were affiliated with Islamic traditions, such as Muhammadiyah, Nahdlatul Ulama, or others, and had no Islamic affiliation.

The social and demographic factors were included as covariates in the analysis. Related to demographics, the variables were sex (male and female), marital status (married and single/separated/divorced/widowed), place of living (rural and urban), perceived economic status (poor and medium-rich), educational attainment, and (high and low). Age was included as a continuous variable. Meanwhile, educational attainment was classified as having 12 years of education or more (high) and lower than 12 years (low).

The analysis model also controlled the variables related to health status and behavior. Self-rated health (healthy and unhealthy), multimorbidity (no and yes), and physical activity (low, moderate, and high) were used in the multivariate analysis and treated as a covariate. Multimorbidity is having two or more chronic diseases.[22] In IFLS, multimorbidity was assessed whether participants had a disease such as hypertension, diabetes mellitus, tuberculosis, asthma, lung illness, heart disease, liver disease, stroke, cancer, tumor, arthritis, and rheumatism. Then, we treated the chronic disease variable as binary, no/yes multimorbidity. Meanwhile, the three levels of physical activity were scored based on the short version of the International Physical Activity Questionnaire (IPAQ) with three-level responses (low, moderate, high).[23]

The analysis was focused on a cross-sectional study. The univariate analysis result was presented as a number, mean, and proportion to illustrate the frequency of all predictors. Furthermore, we also identified the association of predictors and the difficulty of physical function using chi-squared and independent t-tests for a categoric and continuous variable, respectively. We also performed a binomial logistic regression analysis to address the statistical association of religious-related variables as a predictor variable and the occurrence of physical function difficulty in Indonesian elderly. The binomial logistic regression was performed using the two different models. Model 1 focused on the effect of religious-related variables without controlling the other predictors using crude odds ratio. Meanwhile, model 2 was controlled by the covariate of the health-related and demography variables. The association was calculated using a 95% confidence interval (CI) to infer the statistical significance. SPSS version 22 (IBM, SPSS Inc.) was used for all statistical analyses.

The data source was open-source data provided by RAND Corporation. The dataset can be accessed at https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS.html.

RESULT

Table 1 depicts the characteristics of participants and associated factors of physical function difficulty using the ADL instrument. In religious-related predictors using bivariate analysis, the significant difference was highlighted in which elderly people having higher intensity in *majelis taklim* and participating in religious programs showed lower values for having no physical function difficulty. Islamic tradition was found to be insignificant in relation to the different scores of ADL. In social and demographic factors, mean age and place of living were associated with the elderly's physical function difficulty. Furthermore, self-reported health, multimorbidity, and physical activity level were found to be significant predictors of ADL-associated factors.

Table 1. Characteristics of participants and associated factors (n=1799)

Variables	Total	Physical function difficulty		P-value
		No	Yes	
Religiosity	n (mean/%)			
Mean Participation Frequency in *"Majelis Taklim"* (SD)	1.83 (1.2)	3.02 (1.394)	2.73 (1.434)	<0.01
Participation in the religious program				<0.01
No	608 (33.8)	476 (78.3%)	132 (21.7%)	
Yes	1191 (66.2)	992 (83.3%)	199 (16.7%)	
Having Islamic tradition or affiliation				0.724
No	357 (19.8)	289 (81.0%)	68 (19.0%)	
Yes	1442 (80.2)	1179 (81.8%)	263 (18.2%)	
Social and Demographics				
Mean Age (SD)	67.84 (6.45)	67.63 (6.373)	68.78 (6.708)	<0.01
Sex				0.669
Male	758 (42.1)	622 (82.1%)	136 (17.9%)	
Female	1041 (57.9)	846 (81.3%)	195 (18.7%)	
Marital status				0.335
Married	1091 (60.6)	898 (82.3%)	193 (17.7%)	
Single/separated/divorced/widow	708 (39.4)	570 (80.5%)	138 (19.5%)	
Place of living				<0.05
Rural	807 (44.9)	640 (79.3%)	167 (20.7%)	
Urban	992 (55.1)	828 (83.5%)	164 (16.5%)	
Perceived economic status				0.157
Poor	614 (34.1)	490 (79.8%)	124 (20.2%)	
Medium and rich	1185 (65.9)	978 (82.5%)	207 (17.5%)	
Educational attainment				
High	244 (13.6)	197 (80.7%)	47 (19.3%)	
Low	1555 (86.4)	1271 (81.7%)	284 (18.3%)	
Health status and behavior				
Self-rated health				<0.001
Healthy	1009 (56.1)	857 (84.9%)	152 (15.1%)	
Unhealthy	790 (43.9)	611 (77.3%)	179 (22.7%)	
Multimorbidity				<0.01
No	1447 (80.4)	1200 (82.9%)	247 (17.1%)	
Yes	352 (19.6)	268 (76.1%)	84 (23.9%)	
Physical activity				<0.001
Low	744 (41.4)	575 (77.3%)	169 (22.7%)	
Moderate	585 (32.5)	491 (83.9%)	94 (16.1%)	
High	470 (26.1)	402 (85.5%)	68 (14.5%)	

Performing binomial logistic regression, table 2 illustrates the association of religious-related factors and physical function difficulty using two different models. Model one utilized the crude odds ratio (COR) to address the association of predictors in outcome variables without the effects of the controlled variable. Meanwhile, model two was fully adjusted by the social demographics and health status covariate variable. Adjusted odds ratio (AOR) was performed in model two. Moreover, model 2 in Table 2 only showed the OR of the main interest predictor, which is the religiosity-related variables.

In model 1, the higher intensity of participation in *majelis taklim* was a protective factor against the odds of physical difficulty (OR = 0.86; 95% CI: 0.79 – 0.94; p <0.01). Compared to non-participation elderly, joining the religious program in the last year was found positively statistically significant for the higher likelihood of preventing the physical function situation (OR = 0.72; 95% CI: 0.56 – 0.92; p<0.05). Nevertheless, having affiliation with Islamic traditions, such as Muhammadiyah, Nahdlatul Ulama, and other Islamic affiliations, was found insignificant to the activity of daily living (ADL) concern in the present research.

The significant role of spirituality in the Indonesian elderly and physical function was also found in model 2. Table 2 illustrates that the all-odds ratio was below 1, indicating the protective role against having physical function difficulty or disability. Interestingly, only predictors related to the intensity joining *majelis taklim were* inversely associated with having physical function difficulty (OR = 0.89; 95% CI: 0.80 – 0.98; p<0.05). An affiliation with an Islamic organization and participation in a religious program was associated with the probability of having no physical function difficulty but was statistically insignificant. The model was

adjusted with all covariates, such as age, sex, marital status, place of living, perceived economic status, educational attainment, self-rated health, multimorbidity, and physical activity.

Table 2. Association among religiosity participation and ADL in Indonesian elderly

Predictors	Model 1	Model 2
Mean Participation Frequency in *"Majelis Taklim"*	0.86 (0.79 – 0.94) **	0.89 (0.80 – 0.98) *
Participation in the religious program		
No	1	1
Yes	0.72 (0.56 – 0.92) *	0.94 (0.69 – 1.29)
Having Islamic tradition or affiliation		
No	1	1
Yes	1.05 (0.78 – 1.42)	0.94 (0.69 – 1.27)

Note: n = 1799. Model 1 used a crude odds ratio. Model 2 was fully adjusted for social demographics (age, sex, marital status, place of living, perceived economic status, and educational attainment) and health status (self-rated health, multimorbidity, and physical activity). *p < 0.05, **p < 0.01, ***p < 0.001. Models 1 and two used a 95% of Confidence Interval.

DISCUSSION

The study examined the association between religiosity involvement and physical function difficulty in the Indonesian elderly. The main predictors were related to participation, frequency, and Islamic affiliation in the last year using the secondary data of IFLS 5. The effects of the frequency of involvement in *majelis taklim* significantly predict the protective outcome against the elderly's physical function difficulty. Besides the frequency, having "yes" participation in religious programs in the last year was positively associated with positive physical function. This finding underlined the positive effect of religiosity based on the participation and intensity (frequency) facet.

The present research indicates the positive effects of the elderly' participation in religious programs, echoing the previous findings.[12,13] Participation in religious programs is associated with the concept of social support. According to Hybels et al. (2012), using the American elderly participant, involvement in spiritual activities can be directly linked to the reciprocal exchange of support between individuals in these activities. Healthy behavior in a group can initiate other individuals to perform healthier behaviors. This spiritual-based activity also has positive implications in increasing physical activity by older people, indirectly reducing the risk of decreasing physical function.[24] Religious affiliation and engagement in spiritual practices positively impact older people's drive to uphold their health in previous research conducted in healthcare settings.[13] Furthermore, the study expounded upon the positive correlation between religiosity and compliance with medication for older people with illness.

Identical to our findings, prior research has further underscored the notable protective impact of the frequency of engagement in religious activities on physical ability.[14,15] Using ADL/IADL, a prospective longitudinal study conducted among the older population in the US demonstrated that individuals engaging in religious activities with a high frequency exhibited superior physical capabilities compared to their inactive counterparts, especially during the baseline period.[25] However, an insignificant aspect in the study was found in the follow-up period. The diminished physiological functioning of the elderly or frailty may contribute to a decline in the protective efficacy of engaging in religious activities over time. Nevertheless, Park et al.'s (2008) longitudinal study found that the intensity of religious program participation effectively prevented disability for the elderly over time.[26] The probability explanation was related to the connection between aging and religiosity. The religiosity of the older population showed a progressive and sustained growth over time in contrast to the younger age group.[27,28] Consequently, a surge in the perceived level of religiosity may engender heightened engagement in religious-affiliated activity.

The other possibilities were related to the Indonesian demographic factors and socioemotional selectivity theory. The number of Muslims in Indonesia is the highest compared to other countries around the globe. Consequently, the practice of Islamic belief is prevalent in Indonesia. According to previous findings, Islam guides its adherents in obligatory and recommended worship acts. Five times per day, it is required to establish prayer or *salat*. Moreover, Islam encourages those who practice it always to be involved in social and religious activities. It is corroborated by previous research findings indicating that religious activities are the most popular program among senior Indonesians.[17] Praying is a spiritual activity combining psychological tranquility with physical movement. It has direct ramifications for the health of older people, particularly the promotion of physical activity. According to previous research, the increased physical activity resulting from this intercession increases musculoskeletal activity and is associated with a

lower risk of physical functioning disability.[29] Meanwhile, the Socioemotional selectivity theory emphasizes that older individuals prioritize activities and receive more information to enhance their health status and well-being.[30] Considering an increase in religiosity quality over time, religious-based activities present an opportunity to strengthen the health of older people.

The current findings have several strengths and limitations. The study's strengths include using abundant social data and applying multiple religiosity concepts (participation, frequency of participation, and affiliation). In addition, the IFLS dataset contains several variables that can explain social demographic and health effects, particularly among the older population of Indonesia. This study also employs control variables like demographics and pertinent health concerns. This investigation has numerous flaws. First, because the data in this study are self-reported, there is a possibility of bias. Second, because this study employs a cross-sectional design, causality between predictors and outcomes cannot be determined. Third, the religiosity component of the employed variable is unique to Muslim respondents only. Nonetheless, this survey uses a large number of respondents with diverse demographic backgrounds.

CONCLUSION

There is a correlation between the participation in a religiosity-based activity and physical infirmity in Indonesian elderly. Health promoters can consider aspects of religiosity to reduce the risk of physical decline in Indonesian elderly.

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CONFLICT OF INTEREST

The authors declare no conflict of interest or affiliation with RAND Corporation and the data collector institution.

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