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Cover Page Footnote

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Health-related quality of life and work ability of smallholder rice farm workers in San Jose, Occidental Mindoro, Philippines

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Abstract

Background: Health is an integral form of human capital that can positively influence agricultural worker productivity in the physical, mental, and social domains. Poor health usually represents a burden to farm workers because a failure to meet scheduled tasks on the farm can later affect the dependents who rely on it for food nourishment and sustained livelihood. This study aims to determine the association between health and the work capabilities of smallholder rice farm workers in San Jose, Occidental Mindoro, Philippines. **Methods:** A cross sectional study was conducted among 100 farm workers. The SF-36 (HRQoL) and Work Ability Index (WAI) questionnaires were used to determine health status and work abilities of the respondents. The association of every health domain was investigated using one-way analysis of variance (ANOVA). **Results:** The results show that work ability was more associated with physical functioning and vitality scales compared to physical role limitations, bodily pain, general health perceptions, social functioning, emotional role limitations, and mental health in the health dimensions. **Conclusion:** Given the influence of health-related quality of life, any intervention program for the safeguarding and promotion of work ability among farmers should be based on balancing and optimizing the physical and psychosocial work environments.

Keywords: agriculture, general health, productivity, quality of life

Introduction

In poor countries, where economy-wide efficiency is low, subsistence food requirements lead workers who are relatively unproductive in agricultural work to nonetheless select employment in that sector.¹ In the Philippines, agriculture is one sector with the least number of workers. Agricultural workforce has fallen consistently, as an average of 250,000 workers leave the sector each year. The decline is caused by the growth of the economy which requires boosting incomes of workers currently in agriculture, either by shifting them to better-paying jobs outside agriculture or raising wages within agriculture.² As farmers intensify production through increasing workload, the negative effects of such practices on their health and productivity become a concern. Despite the mechanization and automation of farm work, there are still numerous physically demanding tasks, especially on small farms. Many tasks involve lifting, hauling heavy loads, awkward work postures, repetitive movements, and vibration.^{3,4}

Work ability refers to one's capacity to cope with the demands of their job. It is less a broad definition than a description of one's functional capacity. Traditionally, occupational health care has assessed work ability and disability from the point of view of illness. Work ability is also an outcome measure to assess productivity loss.⁵ A 2010 study of working population in a formal sector by Ahlstrom, Grimby-Ekman, Hagberg, and Dellve suggests that work ability could be used as a simple indicator for assessing individual's working status and progress on long-term sick leave. Their work ability can act as a guide for tailoring interventions and rehabilitation activities. It is important, though, to consider individuals' functional limitations with regard to health and their potential to cope with work demands and pressure, as well as lifestyle and the role of the close community in promoting individuals' health.⁶ Furthermore, the study finds that those who place a high value on managerial duties are those who feel that their work is less physically strenuous. They experience work engagement more frequently and having good work ability.⁷ However, the study has no findings for farm

workers who perform numerous physically demanding tasks.

Health is an important human capital that can positively influence agricultural productivity through preventative health investment on productivity among farmers corresponding to about 14.7% of the average agricultural output value.⁸ Occupational health deals with all aspects of health promotion and maintenance of the highest degree of physical, mental, and social well-being for workers in all occupations by promoting healthful habits, controlling risks, adapting jobs to the people, and people to their jobs. Worker health has several determinants, including workplace risk factors for cancers, accidents, musculoskeletal and respiratory diseases, hearing loss, circulatory disease, stress-related disorders, and infectious diseases, among others.⁹ There is a large body of evidence showing that people working in farm jobs are exposed to a wide range of physical, mental, and social over-strains affecting their health and work ability. All of these factors seriously jeopardize the work ability, health, and quality of life of farmers.^{10–12} A study of Rostamabadi, Mazloumi, and Foroushan assessing the determinants of farmer work ability with regard to their health-related quality of life revealed that workers were more influenced by physical aspects of the health dimensions, such as physical function, physical limitations for the role, and general health, whereas a lower association was found for scales such as mental health.¹³

Although several surveys in recent years^{14–16} have been conducted on various safety and health problems among Filipino farming populations, little data is available on their work abilities and health status. Recent goals of farmers' health management include reduced dependency on future health care, and the restoration of normal lifestyle functions. These are important goals that improve quality of life rather than simply relieve physical pain, but there are few reports concerning work ability and quality of life among farmers. In this context, this study aimed to determine the influence of quality of life health dimensions on the work abilities of smallholder rice farm workers in San Jose, Occidental Mindoro, Philippines.

Methods

Design. This research employed a descriptive and cross-sectional design conducted in the Municipality of San Jose, Province of Occidental Mindoro, Philippines. The study utilized a survey questionnaire conducted from April–July 2018.

Participants. Out of 120 smallholder rice farm workers attending farmer field school (FFS), a total of 100 were selected to participate in the survey. These workers cultivate not more than two hectares apiece of farmland

primarily devoted to rice production. They all had at least five years of rice farming experience.

Measures. Data were gathered via survey questionnaires administered at farmer field schools and farm households. Demographic profiles inquired as to age, sex, educational attainment, household size and income, health insurance status, farm size, and number of working hours per week. Work ability was measured by the Work Ability Index (WAI) questionnaire,¹⁷ which was translated into Tagalog. WAI is calculated by summing the points ascribed to seven items, including: current work ability compared with lifetime best (0–10 points); subjective work ability with regard to physical and mental demands of work (2–10 points); current number of diseases diagnosed by a physician (1–7 points); subjective estimated work impairment due to diseases (1–6 points); absenteeism due to illness during the past year (1–5 points); personal prognosis for work ability two years from now (1, 4, or 7 points); and mental resources (1–4 points). The index score ranged from 7 to 49 points and the scores were categorized as poor, moderate, good, and excellent. In the original version, reference limits were used to classify WAI into four groups, including poor (7–27 points), moderate (28–36 points), good (37–43 points), and excellent (44–49 points). The WAI and all its items reliably predicted work disability, retirement, and mortality.¹⁸ It carried internal consistency reliability value across all scales, with Cronbach's α of 0.701 to 0.808.¹⁹

The health-related quality of life (HRQoL) was measured using the eight health concepts of the 36-Item Short Form (SF-36): physical functioning (10 items), physical role limitations (four items), bodily pain (two items), general health perceptions (five items), energy/vitality (four items), social functioning (two items), emotional role limitations (three items), and mental health (five items). It also includes a single item that provides an indication of perceived change in health status.²⁰ A 2013 study in two Philippine cities found the SF-36 to be a valid instrument for measuring community health. With regards to reliability, the survey exhibited good internal consistency, with Cronbach's alpha coefficient ranging from 0.78 to 0.87, exceeding the recommended value for all scales except for general health, vitality, and social functioning.²¹ On the other hand, internal consistency reliability values of SF-36 in a similar study shows acceptable results with the same version, with Cronbach's α ranging from 0.60 to 0.80.²²

Ethical Consideration. This paper was technically reviewed and approved by the Research Council of Occidental Mindoro State College under its Research Development and Extension Unit. Participation in the study was voluntary; respondents were given the option to answer the questions or not. Complete anonymity of the research participants was observed. The respondents

were informed of the right to confidentiality and privacy. Clarifications were offered by the researcher to facilitate easy understanding of statements in the survey. After signing the informed consent, data collection proceeded. The questionnaire was coded and listed in a separate sheet, and code from the list was later matched after data collection. Specific information on the questionnaires could not be linked to specific individuals. Access to the data was limited solely to the researcher.

Data Analysis. Microsoft Excel was used for data entry. Only one database was created. The Microsoft Excel file was then exported to Epi Info 7 for data analysis.

Demographic data was broken down as age (ordered categorical), sex (unordered categorical), educational attainment (ordered categorical), household size (ordered categorical), household income (ordered categorical), health insurance status (unordered categorical), farm size (continuous), and number of working hours per week (continuous).

The total WAI score was calculated as the sum of the seven dimensions and ranged from 7–49. WAI categories were “poor” (7–27), “moderate” (28–36), “good” (37–43), and “excellent” (44–49) work ability. The score was converted so that the highest value (49) represented the poorest work ability and the lowest value (7) represented the best work ability, to denote that lower work ability is a risk factor for a greater number of sick days. The converted score was used in all analyses, except for the descriptive statistics, to facilitate the interpretability of the results.

In scoring the SF-36, previously-coded numeric values were recorded per scoring key.²³ All items were rated such that a high score denoted a more favorable health state. In addition, each item was scored on a 0-to-100 range so that the lowest and highest possible scores were 0 and 100, respectively. Scores represented the percentages of total possible scores achieved. Items in the same scale were averaged together to create the 8-scale scores. Items left blank (missing data) were not considered when calculating the scale scores. Hence, scores represent the average for all items in the scale that the respondent answered.

Descriptive statistics were used to describe the characteristics of the study population. The effect of

demographic variables on the WAI was investigated using the t-test and one-way ANOVA for both ordered and unordered categorical data. A T-test was used to correlate WAI scores in the binary data analysis. Association between WAI and SF-36 scores was analyzed using one-way ANOVA with the level of significance at 0.05.

Results

The demographic characteristics of the studied population is shown in Table 1. It reveals that the majority, or 79%, of smallholder rice farmers are male and considered to be middle-aged adults with an age range of 36–55 years of age (50%). In terms of educational attainment, most of them had reached high school level (34%). Most had household sizes ranging from 3–6 members, classified as small-to-medium-sized households (37%). The majority (62%) had health insurance holders earning a monthly household income above the Philippine poverty threshold and working for an average of not more than 40 hours per week. The average household income is 10,645 pesos with SD of 7125.6 and the mean of farming hours is 33.66±9.48.

Table 2 shows the health-related quality of life by general characteristics of the smallholder rice farm workers in the study. The respondents had high mean scores in eight domains of HRQoL. The dominant dimensions were physical functioning (70.03±29.6), social functioning (71.0±26.3), and general state of perceived health (76.5±30.5).

The results displayed in Table 3 show that overall mean WAI score (35.6±6.3) was moderate (Table 3). When looking at the distribution by category, there appear some differences, especially that 56% of the rice farm workers had unsatisfactory working abilities (i.e. communication, decision-making, problem-solving, and time management) this due to heavy work demands (Table 4).

Based on the results, it appears that age ($p = 0.002$), household size ($p = 0.011$), and possession of health insurance ($p = 0.011$) are predictors of work ability among the study population (Table 5).

It also appears that the physical functioning component of health-related quality of life has a positive influence on work ability. On the other hand, the vitality component has a negative influence (Table 6).

Table 1. Demographic characteristics of smallholder rice farm workers

Demographic Variables	Frequency	Percentage
Sex		
Male	79	79
Female	21	21
Age		
Young adult (18–35 years)	21	21
Middle adult (36–55 years)	50	50
Older adult (56 years above)	29	29
Education		
No formal education	5	5
Elementary level	11	11
Elementary graduate	11	11
High school level	34	34
High school graduate	14	14
College level	12	12
College graduate	13	13
Household size		
Extra small (1–2 members)	6	6
Small (3–4 members)	37	37
Medium (5–6 members)	37	37
Large (7–8 members)	12	12
Extra-large (≥ 9 members)	8	8
Health insurance		
With	62	62
Without	38	38

Table 2. Health dimensions of smallholder rice farm workers

Dimensions of Health (SF-36)	Min	Max	Mean	SD
Physical functioning	9.0	100.0	70.0	29.6
Limitations related to physical problems	41.3	100.0	69.3	13.5
Limitations related to emotional issues	33.3	100.0	67.9	18.4
Vitality	0.0	75.0	39.4	19.1
Emotional well-being	33.3	91.7	61.3	10.9
Social functioning	0.0	100.0	71.0	26.3
Physical pain	0.0	100.0	66.1	23.8
General state of perceived health	0.0	100.0	76.5	30.5

Table 3. Work ability index scores of smallholder rice farm workers

Work Ability Domains	Min	Max	Mean	SD
Current work ability compared with the lifetime best	2	10	7.8	2.1
Work ability in relation to the demands of the job	2	10	7.4	1.8
Number of current diseases diagnosed by a physician	1	7	3.6	2.3
Estimated work impairment due to diseases or injuries	1	6	5.1	1.2
Sick leave during the past year (12 months)	2	5	4.4	0.8
Own prognosis of work ability two years from now	1	7	4.4	1.6
Mental resources	1	4	2.9	0.8
Work Ability Index Score	21	49	35.6	6.3

Table 4. Prevalence of work ability among smallholder rice farm workers

Work Ability	Frequency	Percentage
Satisfactory		
Excellent	12	12
Good	32	32
Unsatisfactory		
Moderate	48	48
Poor	8	8

Table 5. Relationship between demographic characteristics and Work Ability Index scores

Variables	Mean	SD	<i>p</i>
Sex			0.626
Male	35.95	5.70	
Female	34.29	8.03	
Age			0.002*
Young adult (18 – 35 years)	39.00	5.59	
Middle adult (36 – 55 years)	36.28	5.98	
Older adult (56 years above)	31.97	5.49	
Education			0.457
No formal education	31.60	3.78	
Elementary level	35.27	5.82	
Elementary graduate	33.45	6.39	
High school level	36.03	6.47	
High school graduate	34.93	4.91	
College level	35.67	6.49	
College graduate	38.77	7.25	
Household size			0.011*
Extra small (1 – 2 members)	35.17	7.88	
Small (3 – 4 members)	35.68	6.23	
Medium (5 – 6 members)	36.86	5.89	
Large (7 – 8 members)	35.92	5.87	
Extra-large (9 and above members)	29.25	4.59	
Health insurance			0.011*
With	35.79	5.41	
Without	35.48	6.75	

p* < 0.05Table 6.** Relationship between health dimensions and Work Ability Index scores

Dimensions of Health	Work Ability				Average	<i>p</i>
	Excellent (N=12)	Good (N=32)	Moderate (N=48)	Poor (N=8)		
Physical Functioning	94.3±6.8	79.8±25.8	61.3±30.4	47.1±25.0	70.0±29.6	0.007*
Limitations Related to Physical Problems	84.4±7.6	73.9±13.0	64.0±11.3	59.8±10.4	69.3±13.5	0.218
Limitations Related to Emotional Issues	85.6±7.4	71.9±18.5	62.2±18.0	59.2±9.0	67.9±18.4	0.710
Vitality	25.0±22.0	33.6±18.9	44.3±15.9	54.7±13.3	39.4±19.1	0.005*
Emotional Well-Being	59.7±14.1	62.0±10.4	61.5±10.7	60.4±11.6	61.3±10.9	0.135
Social Functioning	90.0±10.4	76.9±26.4	63.8±26.6	62.5±22.5	71.0±26.3	0.127
Physical Pain	81.7±13.4	75.6±20.8	59.4±23.9	45.0±17.7	66.1±23.8	0.251

**p* < 0.05

Discussion

The purpose of this study was to determine the association of quality of life health dimensions on the work abilities of smallholder rice farm workers in San Jose, Occidental Mindoro, Philippines. It was discovered that the physical functioning component of health-related quality of life has a positive influence on one's work ability. That said, the vitality component has a negative influence on work ability. In similar studies, a strong association was found between physical scales of health, such as physical functioning, and work ability.^{14,24} By contrast, the current study offers statistically significant evidence that work ability is negatively influenced by vitality. Strijk et al described vitality as the individual's feeling of being energized, setting goals in life and putting effort in achieving them, and ability to deal with everyday problems and challenges in life.²⁵ This findings were contradicted to the findings of van Scheppingen et al.²⁶ and Dubreuil, Forest and Courcy²⁷ which considers vitality at work is an important factor for optimal functioning and sustainable work ability endorsing the combined health-based, business-related and societal importance of vitality at work. In a study among coach drivers by van Schaaik, Nieuwenhuijsen, and Frings-Dresen²⁸ revealed that the overall work ability and vitality decrease significantly as the workload increases in peak season, while work-related fatigue accumulates. Other studies state that pain/discomfort and anxiety/depression should be afforded the same attention about work ability.^{29,30} Another study revealed that perceived health and psychosocial factors, rather than work conditions, explained the association between the presence of a chronic health condition and work ability. Variables associated with work ability were similar for workers both with and without chronic health conditions. Therefore, workers with chronic health conditions and work ability might benefit the most from a policy focusing on enhancing these associated variables.³¹

In this study, most smallholder rice farmers are male, middle-aged adults of 36–55 years. Most have high school educations and small-to-medium-sized households of 3–6 members. They were largely health insurance holders earning monthly household incomes above the Philippine poverty threshold and worked for an average of not more than 40 hours per week. One reason for this result could be that by age 50 and older, thoughts of retirement usually arise which can affect their current work ability.³² The progressive aging, the low-level education, and the long work histories were related to a reduction in work ability, which increases the risk of work disability or early retirement.³³ Work motivation to sustain the family has an impact on work ability, thus, increasing farming productivity.³⁴ The more productivity in the agriculture business, the

higher the motivation to work. The higher work ability and agricultural productivity, the more agriculture business. Work impairments and reduced work ability were associated with greater health care use among workers.³⁵ These findings suggest that addressing work-related problems in workers with common disorders may help reduce health care needs. Based in the results, age, household size, and possession of health insurance are associated with work ability among the study population. One reason for this result could be that at age 50 and older, thoughts of retirement usually arise which can affect current work ability.³⁶

As part of physical functioning, the respondents displayed high capability of physical activities, such as walking, self-care, lifting, climbing, and the ability to perform moderate-to-vigorous activities. The study coincides with a Korean agricultural industry report linking high physical functioning with the physical component of farming.³⁷ Also, as part of the mental health dimension, the respondents show high capability of ensuring social activities such as attendance to community meetings, communicating agricultural information, interaction with agricultural markets, and participation to other agricultural programs in the community such as farmer field school (FFS) and agricultural extension activities. Lastly, the respondents were satisfied with their overall current state of health. A 2017 Chinese study in Zhejiang Province revealed that the HRQoL of farmers was better than that of workers in the manufacturing industries in the same setting and recommends improving HRQoL. In addition to caring for people's physical ailments, it is also important to pay more attention to the physiologic aspects.³⁰ The results show that overall work ability of the respondents was moderate. When looking at the distribution by categories, it is clear that there are differences. It is showed that most of the small holder rice farm workers in the study have unsatisfactory working skills to respond to heavy work demands. These skills include communication, decision-making, problem-solving, and time management. A study explained that work ability is affected by age, lower-back pain, and negative health perception. These are factors that should be increased in the future because they act as positive predictors of strong work ability, such as having job training in the previous two years, a good sense of community at work, and a favorable work ethic.³⁸

The people with indications for being subject to targeted preventative actions are those with moderate-to-low WAI, which constitute greater than one-third of the sample. In terms of different lines of business, the fastest decline in work ability was typical for health care.³⁹ It was observed that experiencing pain reduces productivity, but it does so to a greater extent in the

good WAI group, rather than among the people with moderate work abilities.⁴⁰

A limitation of this study was the fact that the sample was drawn from farmers while they were present at farming classes. So, it does not include those farmers who did not plan to attend the classes. Nor does it claim to represent all Filipino farmers, regardless of geographic limitations. One could not claim that the sample fully represented the sociocultural groups living in the province. One would need to conduct further studies to test the psychometric properties of the scale in the samples representing the different groups.

The study also used self-reported measures, so perhaps the respondents were not always able to provide correct information to the researcher. Furthermore, the study was limited by its cross-sectional nature, because of which the relationships between health-related quality of life and work ability did not necessarily indicate causal relationships.

Conclusion

This study concludes that the smallholder rice farm workers in San Jose, Occidental Mindoro, Philippines have above-average-to-high levels of health-related quality of life. They generally enjoy a high level of work ability and their ages, household sizes, and health insurance influence that level. Furthermore, physical functioning shows a positive influence upon their work ability, while vitality has a negative influence on their work ability. Therefore, any intervention program for health promotion among the farmers in question should be based on balancing and optimizing the physical and psychosocial work environments, with a special focus on reducing physical work load via methods such as mechanization.

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Conflict of Interest Statement

The authors declare that they have no competing interest.

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