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Short Communication

Health, wellbeing and safety among farmers in small rural areas of Indonesia - a pilot study

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Abstract

Introduction: Agriculture is Indonesia's largest sector and largest employer, with 10.5% (40.9 million) of the population working in agriculture, forestry or fishing. However, little is known about agricultural workers' health status; risk factors for non-communicable diseases such as heart disease, stroke, cancer, respiratory diseases, diabetes; and wellbeing. This study aimed to undertake a pilot to assess health status, behavioural risk factors, wellbeing and safety among farmers in Indonesia.

Methods: Data were collected from 51 participants in a small rural area of East Java, Indonesia. Trained medical students, supervised by doctors, conducted assessments including anthropometric measurements, overall health status, lifestyle factors and wellbeing using the translated Kessler Psychological Distress Scale (K10). Data analyses were performed using SPSS statistical software and presented descriptively.

Results: The mean age of farmers was 39.5 years with the majority having normal BMI (64.7%). Most farmers reported good health status (62.7%), good hearing (98%), and good vision (88.2%). Overall health is not interfered with their farm activities (76.5%). A total of 76% were active smokers, and 96.1% had low diabetes risk based on the Finnish Diabetes Risk Score – Bahasa Indonesia as well as low psychological distress (76.5%) using the K10-

Indonesian adapted scale. All participants used agrichemicals and use of appropriate personal protective equipment was lacking. **Conclusion**: Farmers in this pilot study generally reported good health status, although smoking and use of and exposure to agricultural chemicals were highly prevalent. Although a pilot study, the findings highlight the need for further studies on the health, wellbeing and safety of farmers to engage the agricultural community and foster collaboration between local health services, farmers' groups and students.

Keywords

chronic disease, farming, health status, Indonesia, male, smoking, wellbeing.

Introduction

Indonesia is predominantly an agricultural country, with 10.5% of its labour force engaged in the agricultural sector. In 2023, 29.3 million people were working as farmers, primarily residing in rural areas in Indonesia[1]. Reflecting global trends[2], the number of farmers in Indonesia has decreased compared to the number in 2013[1].

Several factors contribute to poor health outcomes among farming populations and they also affect productivity. International studies cite demographic factors such as gender and age[3,4]; socioeconomic status[5]; personal behaviours[6]; hazardous environmental conditions, including use of agrichemicals[7,8]; access to health services[9,10]; and injuries, including from motorbikes and quad bikes[11]. Most Indonesian farmers live in rural areas, experiencing high disparities in socioeconomic opportunities and limited access to health services compared to urban dwellers[12,13]. Most earn little money and cannot afford to take time away from farm work or pay for health treatment; use of motorcycles for transporting agricultural products is common in some areas[14]. Tobacco farming is a significant part of the agricultural sector in Java[15] and cigarette smoking is a major health risk[16]. In 2019, Indonesia ranked third globally for active smokers, with a prevalence of 31%[17]. However, smoking rates were highly gendered: 64% of males over 15 years compared to only 2.3% of females over 15 years[18].

The farming population in Indonesia is predominantly older, with most farmers aged over 40 years[1]. Increasing age is a risk factor for chronic and degenerative diseases. The Indonesian Ministry of Health report of 2018 noted a 10.9% prevalence of type 2 diabetes mellitus, and the number has been increasing compared to that of previous surveys[19]. Studies in Indonesia reporting increased risk for diabetes included lifestyle behaviours, and sociodemographic and socioeconomic factors[5,20]. Additionally, Idris et al (2013) indicated that living in rural areas is a risk factor for diabetes, mirroring global trends – particularly in low-to-middle income countries like Indonesia[21].

The prevalence of mental and emotional health disorders among Indonesians aged over 15 years increased to 9% (19 million) in 2018, up from 6% in 2013[19]. However, specific data on the prevalence of poor mental health in rural areas or the farming population in Indonesia is limited.

This pilot study described the health and wellbeing status, behavioural, lifestyle and safety risk factors among farmers in Indonesia. It aimed to work with both farmers – who have traditionally been difficult to reach – and rural health workers to improve their engagement and provide a learning experience for medical students. This pilot study is part of our collaboration with the National Centre for Farmer Health in Victoria, Australia, and seeks to enhance the competence of health professionals in addressing the unique health needs of farmers.

Methods

Participants were recruited from Sukogidri District, Jember, in the eastern part of Java, Indonesia and belonged to a local farmers' group. Each participant was given detailed information about the study and those who agreed to participate signed informed consent. The Central Bureau of Statistics (*Badan Pusat Statistik*) reported that 99.9% of residents in Sukogidri are Muslim[22].

Data for this observational study were collected in 2021 by four medical students supervised by three local health professionals and one academic medical doctor from the University of Jember in East Java, Indonesia. They used a survey on farmer health and lifestyle developed by the National Centre for Farmer Health. This survey has been utilised in Bangladesh, Canada[23], India and Australia[24]. Data included demographic characteristics, waist circumference and height; and self-reporting of overall health, body pain, alcohol consumption, hearing, vision, hypertension, medication use, smoking, safety practices, diabetes risk using the eight indicators of the modified Finnish Diabetes Risk Score – Bahasa Indonesia (FINDRISC-BI)[25] and psychological distress utilising the Kessler Psychological Distress Scale (K10)[26]. The survey included both closed-ended questions, and four- or five-point Likert [27] scale questions that were based on the social and environmental determinants of health[28] and translated from English into Indonesian. Participants completed a hard copy survey and were allocated an individual identity code to de-identify them from the analysis process. Data were entered into Microsoft Excel and into the Statistical Package for the Social Sciences v28 (IBM Corp; https://www.ibm.com/products/spss-statistics), and cross-checked with the supervisor. Analysis was conducted in SPSS with descriptive frequency testing, including minimum and maximum dispersion and mean.

BMI measurements were based on the WHO definition for the Asian population[29]. Physical activity was categorised as regular, moderate, mild and no exercise/sedentary activity[30]. Mental health screening was undertaken using the K10[26]. Participants' scores were initially categorised using standard thresholds of 10–15 (low), 16–21 (moderate) and >22 (high) psychological distress[21]. However, as these thresholds have not been validated in Indonesian farming populations, and cultural differences may influence how psychological distress is expressed and reported, an alternative cut-off was also considered. A recent study by Tran et al (2019) on Indonesians aged 16–18 years proposed a lower score threshold (≤18) to indicate the likelihood of depression and/or anxiety[31]. Given the lack of context-specific validation and

emerging evidence suggesting potential cultural variation in mental health presentation, both cut-off schemes were applied to support interpretation and comparability.

Ethics approval

The study received ethics approval from the Health Research Ethics Committee of the Faculty of Medicine, University of Jember (1272/H25.1.11/KE/2021).

Results

Fifty-one participants were included in the study, as shown in Table 1. All participants were male, aged 18–54 years, with a mean age of 39.5 years. Most participants (64.7%) had a normal BMI. Seventy-six percent of participants were smokers, but none consumed alcohol.

Regarding general health, most participants (78.4%) reported good or very good health, with 51% reporting no body pain and 76.5% having no health condition that interfered with their daily work activities. Good hearing was reported by 98% of participants, and 74.5% had no difficulties in doing activities with their hands; 88.2% had no difficulties recognising people's faces across a road, reflecting good vision.

A total of 5.9% of participants reported taking medication for hypertension, 56.9% consumed vegetables and fruits every day and 74.5% of participants reported undertaking mild physical activity. When asked about a family history of diabetes, 92.2% reported no parental diabetes. Most participants (94.1%) had a waist circumference of less than 94 cm.

The study surveyed safety practices regarding the use of chemicals, personal protective equipment (PPE) usage, and wearing of motorbike helmets. All participants reported using chemicals in their agricultural activities. Common PPE reported were a mask such as a cloth mask or bandana (72.5%), and gloves (35.3%). Most reported wearing long-sleeved shirts (90.2%), long pants (88.2%), broadbrim hats or *caping* (a traditional hat made from bamboo) (58.8%) as PPE to prevent UV exposure, although 96% of participants reported never using sunscreen for UV protection. Most (60.8%) reported using a helmet all the time when riding a motorbike. The diabetes risk survey used was the modified FINDRISC-BI[25]. The majority of participants (96.1%) had a low risk of diabetes (Table 1).

Table 1: Participant demographic characteristics, self-reported health and nutritional status, and risk factors for non-communicable diseases

Variable	Characteristic	*n*/mean (range)	Percentage (%)
Male		51	100
Age (years)		39.5 (18–54)	–
BMI (range 15.9–33.8) (kg/m^2)	<18.5 (underweight)	7	13.7
	18.5–24.9 (healthy weight)	33	64.7
	25.0–29.9 (overweight)	8	15.7
	≥30.0 (obese)	3	5.9
Smoker		39	76.5
Alcohol consumer		0	0.0
Overall health	Moderate	11	21.6
	Good	32	62.7
	Very good	8	15.7
Body pain	None	26	51.0
	Very mild	18	35.3
	Moderate	6	11.8
	Severe	1	1.9
Health interferes with work activities	Not at all	39	76.5
	Slightly	8	15.7
	Moderately	4	7.8
Hearing	Good	50	98.0
	Difficulty hearing in one ear	1	2.0
Difficulty doing activities with hands	Not at all	38	74.5
	Slightly	10	19.6
	Moderately	1	2.0
	Severely	2	3.9
Difficulty recognising faces of people (eyesight)	Not at all	45	88.2
	Slightly	6	11.8
Taking antihypertension medication		3	5.9
Consumption of vegetables and fruit	Every day	29	56.9
	Not every day	22	43.1

Level of physical activity	None	3	5.9
	Mild	38	74.5
	Moderate	7	13.7
	Regular	3	5.9
Parents have diabetes	No	47	92.2
	Yes – one parent	4	7.8
Waist circumference (cm)	<94	48	94.1
	94–102	2	3.9
	>102	1	2.0
Use chemicals		51	100.0
Wear PPE when using chemicals	Clothes[†]	51	100
	Mask (cloth mask/bandana)	37	72.5
	Goggles	3	5.9
	Gloves	18	35.3
	Face protection	4	7.8
	Other (not specified)	24	47.0
Use sunscreen	Usually	1	2.0
	Occasionally	1	2.0
	Never	49	96.0
Type of PPE used in sun	Long-sleeved shirt	46	90.2
	Broadbrim hat/*caping*	30	58.8
	Peaked hat	17	33.3
	Sunglasses	11	21.6
	Long pants	45	88.2
	Sunscreen	3	5.9
	Gloves	1	2.0
	Other (not specified)	19	37.3
Wear helmet when riding motorbike	Yes, all the time	31	60.8
	Usually	20	39.2
Wear seatbelt in front seat	Always	24	47.1
	Occasionally	18	35.3
	Rarely	7	13.7
	Never	2	3.9
Wear seatbelt in back seat	Always	16	31.4
	Occasionally	18	35.3
	Rarely	12	23.5
	Never	5	9.8
Level of psychological distress (K10)	10–15 (low)	22	43.1
	16–21 (moderate)	27	53.0
	22–29 (high)	2	3.9
Risk of developing type 2 diabetes within 10 years (FINDRISC-BI)	<7–10 (low)	49	96.1
	≥11 (high)	2	3.9

[†] Survey response option was 'overalls', which has been interpreted as 'clothes'.
FINDRISC-BI, Finnish Diabetes Risk Score – Bahasa Indonesia. K10, Kessler Psychological Distress Scale. PPE, personal protective equipment.

Data on wellbeing were determined based on the K10[21]. A comparison of the K10 classification and K10 classification for young Indonesians (16–18 years) showed a different result. Using the K10, the majority of participants (53.9%) reported moderate or high psychological distress, while using the recent K10 for Indonesian young adults showed a majority (76.5%) had low psychological distress[24] (Table 2).

Table 2: Comparison of study participants' psychological distress scores based on Kessler Psychological Distress Scale (K10) classification and on K10 classification for Indonesian young adults

K10 classification scores			K10 classification scores for young Indonesian adults[†]		
Score	*n*	%	Score	*n*	%
10–15 (low)	22	43.1	<18 (low)	39	76.5
16–21 (moderate)	27	53.0	≥18 (high)	12	23.5
22–29 (high)	2	3.9			

[†] Cut-off age ≥18 years.

Discussion

This pilot study was conducted among farmers in a small district in east Java, Indonesia to collect data on health status, diabetes risk, safety and wellbeing. The study was challenging for both the investigating team and the farmers due to the remote farm locations and work commitments. While the recruitment was supported by the head of the farmers' group, farmers indicated the best time to meet was in the evening, which posed difficulties for the researchers and students who needed to travel.

All participants were male farmers, reflecting the community culture where men are primarily responsible for farming activities. This aligns with national statistics showing that a larger proportion of farmers in Indonesia are male (76%). The average age of farmers in this study was 39.5 years. Indonesian national statistics report that 42.0% of farmers are aged 43–58 years and 25.6% are aged 59–77 years, while millennial farmers (aged 19–39 years) constitute only 21.9% of the farming population[1].

Most farmers reported good health status, with minimal or no body pain, good hearing and vision. This finding contrasts with studies in Australia, the UK and Ireland, which note farmers reporting higher rates of hearing loss and body pain than non-farmers[32,33].

In terms of diabetes risk, the modified FINDRIS-BI showed low diabetes risk. Physical activity and fruit and vegetable consumption are the factors that contributed to the low score. In this study, 76.5% of participants reported smoking, which is a major health risk factor for various diseases[34-36]. This result is concerning and above the national male smoking rate[18]. Possible explanations for the high rate of smoking are low compliance for regulations due to poor enforcement, lack of tobacco control policies, marketing of tobacco products, the low price of cigarettes, unsuitability of current interventions for farming communities and social customs of sharing cigarettes[34,37,38]. The number of smokers is concomitant with the future burden of smoking-related health problems such as diabetes, hypertension and lung disease[16].

The study also assessed psychological distress using the K10 scale. The classification of psychological distress varied between the K10 and the K10 Indonesian adult-adapted versions, potentially due to cultural differences influencing responses. Indonesian farmers reported low psychological distress, possibly due to effective coping strategies and strong religious faith[39]; however, it is difficult to interpret the difference in results in this sample.

All farmers in this study used agrichemicals with non-standardised PPE during application, contrary to the International Labour Organization's *Code of practice on safety and health in agriculture*[40]. Results indicated that PPE typically consisted of basic clothing and makeshift masks (cloth, bandana). Research undertaken indicates that there are many reasons why farmers don't use PPE, including a lack of education, literacy and access to extension services, as well as attitudes and age. A recent study undertaken by Istriningsih (2022) indicated that a high level of knowledge does not mean that farmers will apply this knowledge in practice[41]. It may be in this case (given farmers had tried to wear a mask) that cost and access to suitable PPE is an issue.

Limitations

As a pilot study, these results should be interpreted with caution. A small sample size from a rural area of Indonesia restrains the generalisability of the study findings to Indonesian farmers. The self-reported method of assessing health status and behaviours could lead to a response bias of reporting good health. Social stigma in reporting mental health issues may also bias responses[42,43]. The lack of any female farmers limits any generalisability to women farmers and is an area of focus for future studies.

Conclusion

This pilot study described the overall health status, behavioural and lifestyle risk factors among farmers in a small rural district of East Java, Indonesia. It aimed to engage farmers who have traditionally been difficult to reach, and to work with rural health workers to improve their engagement with this population.

The preliminary findings from this pilot identify areas needing intervention, particularly regarding smoking cessation and the use of PPE when handling and using agrichemicals. With the high rates of smoking, and risk of chronic and acute respiratory disease, future research could focus on indicators of lung disease specifically, for example breathlessness and cough. There is a need for further research on farmers' mental health including further adaptation of the K10 for older Indonesian populations. Targeted health, safety and smoking cessation interventions are essential to enhance farmers' health, productivity and reduce chronic disease burdens. It is crucial to understand the specific characteristics of each farming community because health, wellbeing and safety risks vary across different regions and countries.

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Conflicts of interest

SB and TH work at the National Centre for Farmer Health, and ES works at the University of Jember.

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