



IMPROVING HEALTHY LIFESTYLE COMPLIANCE IN AGRICULTURAL COMMUNITIES THROUGH THE AGRONURSING MODEL: AN EXPERIMENTAL STUDY

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ABSTRACT

Background: Agriculture plays a vital role in economic development however, the health and welfare of agricultural workers are often overlooked. The absence of holistic and specific approaches to health issues in the agricultural community provides an opportunity for developing new models, such as Agronursing to address the health challenges of

agricultural workers. **Aim:** This study aims to evaluate the effectiveness of the Agronursing Model, which combines agronomy and nursing principles, in improving healthy lifestyle adherence among agricultural workers, ultimately enhancing their overall well-being. **Method:** An experimental quantitative method was employed, utilizing a descriptive analysis and survey approach to assess a Healthy Lifestyle Education intervention among 250 farmers in the Sukodono Health Center Working area, Lumajang Regency. Respondents were recruited through probability sampling, with data collected via questionnaires and observation sheets focusing on healthy lifestyle compliance. **Results:** The results demonstrated significant improvements with a p -value of 0.000, indicating that the agronursing-based educational intervention improved respondents' healthy lifestyles. The agronursing model is effective in improving healthy lifestyle adherence among farmers. Enhancements included increased physical activity, better dietary adherence, reduced fatigue, and decreased financial anxiety and work-related stress.

Keywords: Healthy Lifestyle; Compliance; Agricultural Communities; Agronursing

ABSTRAK

Pertanian memainkan peran penting pada sektor ekonomi, namun kesehatan dan kesejahteraan pekerja pertanian seringkali diabaikan. Ketidadaan pendekatan holistik dan spesifik terhadap masalah kesehatan di komunitas pertanian membuka peluang untuk pengembangan model baru seperti Agronursing guna mengatasi masalah kesehatan para pekerja pertanian. Penelitian ini bertujuan untuk mengevaluasi efektivitas Model Agronursing, yang menggabungkan prinsip agronomi dan keperawatan, dalam meningkatkan kepatuhan terhadap gaya hidup sehat di kalangan pekerja pertanian, sehingga meningkatkan kesejahteraan mereka secara keseluruhan. Metode kuantitatif eksperimental digunakan dengan pendekatan analisis deskriptif dan survei untuk mengevaluasi intervensi Pendidikan Gaya Hidup Sehat pada 250 petani di Wilayah Kerja Puskesmas Sukodono, Kabupaten Lumajang. Responden direkrut melalui sampel probabilitas, dengan data dikumpulkan melalui kuesioner dan lembar observasi yang berfokus pada kepatuhan terhadap gaya hidup sehat. Model agronursing efektif dalam meningkatkan gaya hidup sehat di kalangan petani. Hasil penelitian menunjukkan peningkatan yang signifikan dengan nilai p -value sebesar 0,000, yang mengindikasikan bahwa intervensi edukasi berbasis agronursing meningkatkan gaya hidup sehat responden. Peningkatan ini meliputi aktivitas fisik yang lebih tinggi, kepatuhan diet yang lebih baik, penurunan kelelahan, serta penurunan kecemasan finansial dan stres terkait pekerjaan.

Kata kunci: Gaya Hidup Sehat; Kepatuhan; Komunitas Pertanian; Agronursing

INTRODUCTION

Agriculture plays a vital role in economic development, especially in agrarian nations like Indonesia, where a significant portion of the population relies on this sector as their primary livelihood (Gina et al., 2023). The agricultural sector remains a major source of employment in Indonesia, making a substantial contribution to the national economy (Nadziroh, 2020). However, there is an irony in this situation, as despite agriculture being the backbone of national food security, the health and welfare of agricultural workers are often overlooked, even though they face multiple health risks (Khode et al., 2024).

According to recent data, approximately 26.07% of Indonesia's workforce is in the agricultural sector, exposing them to significant health risks, including prolonged pesticide exposure and unhealthy lifestyle practices (Kementerian Pertanian, 2023). These workers not only support the economy but also face health risks that highlight the need for improved healthcare approaches within this sector (de-Assis et al., 2021; Hull et al., 2022; Tenriawaru et al., 2021). Agricultural workers face various health risks such as chronic exposure to pesticides, imbalanced diets, and limited physical activity, increasing their vulnerability to chronic diseases (Anderson & McFarlane, 2011; de-Assis et al., 2021; Khode et al., 2024; Susanto & Wantiyah, 2015). For example, chronic pesticide exposure is known to cause various respiratory and neurological disorders (Finhler et al., 2023; Tarmure et al., 2020). Beyond physical risks, agricultural workers often experience psychosocial challenges exacerbated by unpredictable harvests and extreme weather conditions (Daghagh Yazd et al., 2019). These pressures negatively impact their mental health, often resulting in chronic stress and depression (Zheng et al., 2024). Research shows that uncertain harvest outcomes and extreme working conditions worsen the

mental health of this community (Daghagh Yazd et al., 2019). Addressing physical and psychological health is essential in designing effective healthcare systems for this vulnerable population.

Integrating traditional and contemporary healthcare systems can improve prevention and well-being; contemporary healthcare primarily focuses on diagnosis and treatment, creating a comprehensive approach to enhancing overall health and wellness (Nanda, 2023). Effective support strategies enable communities to gain deeper insights into their health issues, evaluate progress over time, identify factors influencing health outcomes, and track changes within the healthcare system (Morgan et al., 2024). This underscores the need for nursing care models to improve the health status and quality of life for farmers (Susanto et al., 2017). Agronursing is a nursing approach that integrates health services with the context of agriculture, plantations, fisheries, livestock, and agro-industry. This approach focuses on providing holistic (bio-psychosociocultural-spiritual) and comprehensive (promotive, preventive, and curative) nursing care to individuals, families, groups, and communities involved in the agricultural sector. The Agronursing Theory combines agronomic and nursing principles to create effective interventions tailored to the agricultural community. This holistic model integrates agricultural and healthcare knowledge, ensuring that health interventions are contextual and address environmental and occupational health risks unique to the agricultural sector (Susanto, 2022). Although previous studies have explored agricultural community health, most have focused on isolated interventions without considering the broader agricultural context. Research often focuses on specific issues like pesticide exposure or physical injuries but does not comprehensively address physical and psychosocial health challenges.

The Agronursing Theory is a combination of multiple nursing theories, including Betty Neuman's Systems Model, Nola J. Pender's Health Promotion Model, and Madeleine Leininger's Transcultural Nursing Theory (Susanto, 2022). Agronursing views humans as open systems that respond to environmental stressors, where excessive stress can compromise individual defenses and efficacy. Health care practices, including health promotion, nursing care, and care management, are culturally adapted and applied to patients to shift their behavior towards optimal health, ultimately achieving ideal health conditions (Astuti et al., 2024).

There is a significant gap in research regarding theory-based, comprehensive interventions that can be readily applied to daily life. The absence of holistic and specific approaches to health issues in the agricultural community provides an opportunity for developing new models, such as Agronursing, to bridge this gap. This study aims to evaluate the effectiveness of the Agronursing Model in enhancing healthy lifestyle adherence among the agricultural community. Specifically, this study will focus on how this theory can improve health outcomes by addressing the physical and mental health challenges faced by agricultural workers. The significance of this research lies in its potential to create tangible improvements in the health of agricultural communities while contributing to sustainable development goals. By adopting this approach, this study is expected to support long-term health improvements and economic stability within the community. In conclusion, there is an urgent need for theory-based health interventions tailored to the agricultural community's context. The innovative Agronursing Model provides a comprehensive approach to addressing the unique health challenges faced by agricultural workers, with the potential to foster sustainable health improvements in this sector (Susanto, 2022).

METHOD

Research Design, Sample, and Participants

This study employed an experimental one-group pretest-posttest design to analyze the effectiveness of the agronursing model in enhancing healthy lifestyle adherence among the agricultural community (Creswell & Creswell, 2018). The research was conducted from February to June 2024 in the Sukodono Health Center Working area, Lumajang Regency. Inclusion criteria included participants

willing to engage in all study activities, employed in the agricultural sector, and agreeing to sign the informed consent form. The sample consisted of 250 respondents, determined by Lemeshow's sample size calculation (Swarjana, 2022).

Research Instruments

The research instruments included an informed consent form, a questionnaire, and educational materials focused on promoting healthy lifestyle compliance tailored to the agronursing model principles. The questionnaire was adapted from the 2018 RISKESDAS survey to fit the agricultural context. Validity and reliability tests indicated that all items in the questionnaire were valid, with corrected item-total correlation values ranging from 0.639 to 0.941 and significant T values above the T-table value of 0.444 ($\alpha = 5\%$, $n = 20$). Reliability analysis showed that individual characteristic variables (self-motivation questionnaire) had a Cronbach's Alpha of 0.783, indicating adequate reliability; perception questionnaire (Cronbach's Alpha = 0.773), self-efficacy (Cronbach's Alpha = 0.778), and self-regulation (Cronbach's Alpha = 0.788) were also adequate. Environmental factor variables (support questionnaire) showed a Cronbach's Alpha of 0.798, while lifestyle compliance behavior (healthy lifestyle questionnaire) had a Cronbach's Alpha of 0.783. Educational materials included pamphlets, videos, and presentations on nutrition, physical activity, mental health, and agricultural hazards, designed for easy understanding by farmers.

Data Collection

This study used several stages. In the first stage of pre-intervention, the researcher made introductions explained the purpose of the study, and continued to sign informed consent for respondents who agreed and gave a pre-test questionnaire before the intervention. The intervention stage was carried out in 4 meetings within 2 months. The provision of interventions includes health education which is given in stages. Health education provided about healthy diet patterns, increased awareness of the dangers of chemical pesticides, the importance of regulating physical activity and good rest, and stress management techniques. The last stage is evaluation by giving a post-test questionnaire to evaluate the results of the intervention that has been carried out.

Data Analysis

Data were analyzed using univariate and bivariate techniques, with paired t-tests comparing pre- and post-intervention results. Data processing was performed using SPSS software version 25.

RESULTS AND DISCUSSION

This study involved 250 respondents who met the inclusion criteria. The characteristics analyzed included gender, age, and occupation. The results of the analysis will be shown in Table 1.

Table 1. Characteristics of Respondents

Characteristics	n	%
Gender		
Male	102	40.8
Female	148	59.2
Age		
<40 years	31	12.4
41-49 years	43	17.2
50-59 years	87	34.8
60-69 years	66	26.4
>70 years	23	9.2
Employment		
Farm Laborers	150	60
Livestock Farmers	23	9.2
Farmers	30	12
Others	39	15.6

Based on Table 1, the majority of respondents in this study were female, totaling 148 (59.2%), while male respondents numbered 102 (40.8%). In terms of age distribution, most respondents fell within the 50-59 age group, totaling 87 (34.8%), followed by 60-69 years with 66 respondents (26.4%), 41-49 years with 43 respondents (17.2%), those under 40 years (12.4%), and the smallest group was over 70 years, with 23 respondents (9.2%). Regarding occupation, 150 respondents (60%) were agricultural laborers, 23 (9.2%) were livestock farmers, 30 (12%) were independent farmers, and 39 (15.6%) worked in other occupations. These findings highlight a dynamic aspect of the roles individuals assume, especially women who often balance dual responsibilities as both agricultural workers and homemakers, supporting family income (Putri & Anzari, 2021). The predominance of respondents in the pre-elderly age category aligns with research indicating a decline in younger labor within the agricultural sector (Arvianti et al., 2019). This significant involvement of older women suggests the need for agronursing approaches tailored to the specific health needs of aging women, who often face the dual burden of agricultural labor and household responsibilities, with unique health challenges associated with aging.

Table 2. Perbedaan of Pre-Post on Healthy Lifestyle

Variables	Pre	Post	P-Value
Activity Patterns			
Pain During Activity	2.69	1.79	.000
Carrying Water While Working	3.59	4.33	
Drinking Other Than Water	3.16	2.56	
Physical Activities Other Than Work	2.14	2.75	
Amount of Water Consumed	2.08	2.25	
Drinking Water Consumption Time	1.62	1.72	
Dietary Habit			
Breakfast Before Activities	4.00	4.26	.013
Meal Portions According to ISI PIRINGKU	3.62	4.14	
Eat Vegetables at Every Meal	4.04	4.39	
Eating Fruits Every Day	3.00	3.67	
Nutritional Intake Meets Energy Needs	3.79	4.05	
Daily Meal Frequency	2.11	2.11	
Rest Pattern			
Get Enough Rest After a Night's Sleep	3.94	4.09	.000
Napping Habits	3.49	3.63	
Having Sleep Disorders	3.41	2.70	
Sleep Time	2.74	3.43	
Sleepy or Tired While Working	2.59	2.25	
Psychological Health			
Worried about financial situation	2.93	2.53	.001
Able to Cope with Stress	3.43	3.98	
Have a Special Strategy to Manage Work-Related Stress	3.22	3.76	
Talking to Family or Friends When Stressed	3.36	4.02	
Getting Emotional Support from Family or Friends	3.72	4.1	
Attending Stress Management and Mental Health Seminars or Training	1.86	2.48	
Confidence in Facing Challenges	3.69	3.99	
Farmer Community Helps and Supports in Solving Problems	3.07	3.46	
Believe In Invisible Powers or Energy Affecting Life	3.29	2.78	
Performing Certain Rituals or Prayers While Working	2.60	2.98	
Mental Condition Affects Productivity and Performance	3.04	3.37	
Strong Attachment to God at Work	4.06	4.25	
Stronger and Calmer Innerly at Work After Praying	3.93	4.19	
Thinking About the Meaning of Life and Work	2.90	3.53	

Spiritual Beliefs Help Cope with Stress and Work Pressure	3.90	4.22
Using Free Time For Self-Reflection	3.33	3.77
Feeling Success or Failure in Work is Influenced by Spiritual Relationship with God	3.69	3.99
Using Inner Strength and Self-Resources to Overcome Life's Challenges	3.85	4.17
Financial Anxiety	2.93	2.53
Meditation or Prayer	4.33	4.47

This study examined the effectiveness of the agronursing model in promoting healthy lifestyles among farmers, focusing on activity patterns, dietary habits, rest, and psychological health. In the activity domain, variables such as pain during work, carrying water, drinking non-water beverages, physical activity outside of work, water intake volume, and hydration timing all showed significant improvements, with p-values of 0.000. These results indicate increased awareness regarding physical activity and hydration needs. Physical activity is vital for maintaining physical and mental health (Dhuli et al., 2022). Health education interventions can also influence physical activity levels and reduce physical weakness (Casals et al., 2023). Hence, promotional programs in the agricultural sector are essential to improve the quality of life among farmers (Susanto, 2022).

The intervention results also showed significant improvements in dietary habits, such as having breakfast before activities, following portion guidelines according to "ISI PIRINGKU" consuming vegetables with every meal, daily fruit intake, and meeting nutritional needs for energy, as indicated by a p-value of 0.000. These results demonstrate that the agronursing intervention effectively influences changes in certain dietary habits that are relatively adaptable, especially when supported by appropriate guidance and resources. The increase in these variables suggests that education on healthy eating is well-received and contributes to improving the dietary quality of respondents. However, the lack of significant change in daily meal frequency indicates challenges in altering deeply ingrained habits. Dietary patterns are often influenced by income, living environment, and cultural factors (da Costa et al., 2022). Other findings suggest that increased knowledge about nutritional content can influence adolescents' dietary choices toward healthier options (Sari et al., 2023). Furthermore, good dietary habits can also positively impact physical activity levels (Lahiri et al., 2019). Daily meal frequency may be influenced by social and cultural factors, convenience, and time limitations, which are more challenging to change within a short intervention period.

This study analyzed sleep patterns, including adequate rest after nighttime sleep, napping habits, sleep disturbances, sleep duration, and feelings of drowsiness or fatigue at work. The results demonstrated significant improvements with a p-value of 0.000, indicating that the agronursing-based educational intervention improved respondents' sleep quality. This improvement may be attributed to a better understanding of the importance of sufficient sleep and good sleep hygiene, which are crucial for long-term productivity and health, especially for farmers facing high physical demands. Additionally, sleep quality is often influenced by factors such as gender, emotions, physical activity, sedentary lifestyle, stress, coping styles, drinking habits, smoking, and pain (Kyung et al., 2021). Poor work and rest schedules across various occupations can affect workers' sleep quality, making good sleep essential to reduce work fatigue (Armadani & Paskarini, 2023). Furthermore, improvements in rest patterns may also be influenced by better access to nutrition, reduced stimuli, and increased physical activity among farmers (Sejbuk et al., 2022; St-Onge et al., 2016).

In the psychological health aspect, all variables showed a significant positive change with a p-value of 0.000, reflecting improved coping mechanisms and mental resilience among respondents following the agronursing-based educational intervention. This intervention likely provided a deeper understanding of the importance of maintaining emotional balance and managing stress, which is highly relevant for farmers who often face physical and mental pressures in their work. This effect is aligned with the Agronursing theoretical model, which supports coping mechanisms as an

intrapersonal factor through a transcultural approach (Susanto, 2022). Other findings indicate that cultural factors can impact mental health outcomes among workers (Liu et al., 2023).

Pre- and post-intervention results show that the agronursing-based intervention had a highly significant impact across all aspects. The Agronursing Theory model is derived from several nursing theories, including Betty Neuman's Systems Model, Nola J. Pender's Health Promotion Model, and Leininger's Transcultural Nursing Theory. Neuman's Systems Model is based on general systems theory, which views living organisms as open systems interacting with each other and the environment (Ahmadi & Sadeghi, 2017). The Health Promotion Model provides a significant contribution to changing paradigms in nursing practice by emphasizing the importance of prevention and health promotion (Purwatyningsih & Nursanti, 2024). Behavioral change is strongly linked to the individual's knowledge level (Hastuti et al., 2021). Meanwhile, Leininger's model focuses on the alignment of values, beliefs, and cultural actions among individuals and groups (Lasmaida & Dedi, 2024). This integration of theories enables the use of the Agronursing model in healthcare, encompassing health promotion, nursing care, and care management, tailored to local cultural approaches and applied to patients to shift their behavior toward optimal health, achieving ideal health conditions (Astuti et al., 2024). This model demonstrates high effectiveness in altering individual lifestyles, particularly in agricultural areas.

CONCLUSIONS AND SUGGESTIONS

The conclusions of this study indicate that the theoretical foundation of the Agronursing model—drawing on Neuman's Systems Model, Pender's Health Promotion Model, and Leininger's Transcultural Nursing Theory—proves instrumental in addressing the unique challenges faced by farmers. The model's emphasis on prevention, health promotion, and culturally tailored care effectively supports lifestyle changes and fosters sustainable health improvements in agricultural communities. Overall, this study confirms that the Agronursing model is a valuable framework for promoting holistic health in rural farming populations, improving physical, nutritional, emotional, and psychological well-being, and enhancing farmers' quality of life.

Social support within the agronursing program is also essential to strengthen farmers' motivation and adherence to healthy lifestyle changes, such as through discussion groups or experience-sharing sessions. The development of more interactive educational media, such as community-based apps or videos, is recommended to maximize the understanding and application of agronursing principles. The sustained implementation of this agronursing model holds significant potential to improve the quality of life and health of the agricultural community substantially.

ETHICAL CONSIDERATIONS

This study was approved by the Health Research Ethics Committee of the Faculty of Nursing, University of Jember, with the ethical approval number **278/UN25.1.14/KEPK/2024**.

Conflict of Interest Statement

The authors declare no potential conflicts of interest.

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