

# **The Role of Agronursing in Managing Hypertension Among Farmers**

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## **Abstract**

Hypertension remains a significant public health challenge among agricultural workers, particularly in rural areas with limited access to healthcare services. The unique occupational and environmental risk factors faced by farmers, such as heavy physical workload, prolonged heat exposure, unhealthy dietary habits, and low health literacy, contribute to the high prevalence of hypertension in this population. Agronursing, an integrative approach that combines nursing practices with agrarian contexts, has emerged as a promising model for managing hypertension in farming communities. This literature review evaluates the effectiveness of agronursing interventions in reducing blood pressure and improving health outcomes among farmers. A comprehensive literature search across four databases (Semantic Scholar, PubMed, Springer, and ScienceDirect) yielded 10 eligible studies published between 2020 and 2025. These studies explored various interventions, including plant-based diet modifications, community-led health education, involvement of local health cadres, non-pharmacological therapies such as slow stroke back massage, and nurse-led hypertension management. Findings indicate that agronursing interventions significantly contribute to lowering blood pressure, increasing health awareness, and promoting sustainable lifestyle changes. The most successful interventions were those that integrated cultural sensitivity, utilized local resources, and involved trained community health workers or nurses in delivering care. Despite the positive outcomes, several limitations were identified, including short follow-up periods, small sample sizes, lack of randomization, and challenges related to program sustainability and generalizability. This review highlights the importance of context-specific, community-centered

strategies for addressing hypertension among rural populations. It provides policymakers, nursing educators, and healthcare practitioners with insights to develop scalable, evidence-based agronursing programs. Further research is needed to assess the long-term impact of these interventions and their integration into national rural health systems.

**Keywords:** agronursing, hypertension, nursing intervention, farmer, blood pressure management

## Introduction

Hypertension remains one of the leading causes of death globally and is a significant risk factor for cardiovascular diseases such as stroke and coronary heart disease<sup>1</sup>. It is estimated that 1.28 billion adults aged 30–79 years suffer from hypertension worldwide, with nearly two-thirds living in low- and middle-income countries<sup>2</sup>. In Indonesia, the prevalence of hypertension among individuals over 18 years old was reported at 30.8%, showing a slight decrease from 34.1% previously<sup>3</sup>. Despite this improvement, hypertension continues to act as a "silent killer," often asymptomatic until advanced complications arise. While national trends indicate progress, they do not fully reflect the burden of disease among vulnerable populations, particularly farmers. Farmers bear a special susceptibility to hypertension as a result of exposure to excessive physical workload, continuous heat exposure, financial stress, low-nutrient, high-salt diet, and poor awareness of the need for routine health checkups. Research conducted by Prihartono et al. (2022) in West Java found that occupational factors, including exposure to pesticides, consumption of instant foods, and workload pressure, were responsible for the high prevalence of hypertension among farmers. Even though agrarian work is physically demanding, it is not sufficient to safeguard against hypertension risk if a healthy lifestyle is not pursued<sup>4</sup>.

Although the national trend shows improvement, this condition does not fully reflect the burden of disease in vulnerable groups, especially agricultural workers. Agricultural workers have a unique vulnerability to hypertension as they face heavy physical workloads, prolonged exposure to hot temperatures, economic stress, a high-salt but low-nutrient diet, and a lack of awareness of the importance of regular health checks. Research conducted by Prihartono et al. (2022) in West Java found that

environmental factors at work, including exposure to pesticides, consumption of instant foods, and work pressure, contributed to a high hypertension rate among farmers. Though agrarian work is physically demanding, it is not sufficient to protect against hypertension risk without supplementation with a healthy lifestyle <sup>4</sup>.

Rural areas and agrarian communities in Indonesia still face various obstacles in accessing health services. The lack of health facilities, limited medical personnel, and the remote location of health care facilities from people's residences make it difficult for people to get regular blood pressure checks <sup>5</sup>. This situation is further exacerbated by low health literacy, which often causes early detection of hypertension to be delayed. In a study by Susanto & Berdida (2025), it was explained that geographical challenges and limited resources are the main obstacles in implementing equitable health services in villages. In the context of limited health services, community nursing comes as a strategic solution. Community nurses have an important role in health education, early detection, and management of blood pressure through promotive and preventive approaches <sup>6</sup>. The study by Vedanthan et al. (2020) showed that nurse-led hypertension management in rural Kenya significantly reduced blood pressure. Nurse interventions are not only clinical but also include community empowerment to sustainably create a healthy environment. This approach is considered more effective when carried out in environments close to people's daily lives, including agrarian areas <sup>7</sup>.

Agronursing is a new nursing term that combines health science and the agricultural environment. The agrarian society in Indonesia led to the conceptualization of this term as a way of responding to its unique needs by combining nursing practice with the everyday life of farmers <sup>6</sup>. For example, blood pressure screening is conducted by medical caretakers at farmsites, nutrition counseling is provided at cultivation stations, or nearby plant-based eating traditions are presented to help manage hypertension. Agronursing home highlights the need for a relevant, social, and collaborative home within the context of germane and accessible healthcare.

Some consider that they have detailed the ampleness of agronursing mediations. Explore by Susanto et al. (2023) outlined a neighborhood plant-based dietary mediations tradition to decrease blood weight in farmers<sup>8</sup>. However, Yunanto et al. (2024) reported increased prosperity data and medication adherence following the implementation of an agronursing-based program<sup>5</sup>. In development, a task-sharing

approach involving cadres or neighborhood prosperity masters was also shown to be effective in supporting intervention sustainability<sup>2</sup>. These disclosures reinforce the argument that agronursing is not a reasonable concept but a promising, evidence-based approach.

In any case, by showing disdain for the reality that many agronursing practices have been implemented in the field, there is no deliberate review that thoroughly summarizes the validity of this approach for hypertension among rural laborers. Most consider the current approach to be still expressive or protocol-based, without long-term evaluation<sup>9</sup>. In this way, there is a need for an up-to-date mapping of composition that can synthesize these disclosures and identify the first practical intervention plans. This exact study is basic to fill the proof gap and teach the progression of agronursing-based community nursing.

Integrating agronursing into hypertension management is not only innovative but also essential for addressing public health challenges in the agricultural sector. In the context of Indonesia and other developing countries, context-specific and evidence-based community strategies are critically needed to reach vulnerable populations<sup>6,7</sup>. This review aims not only to summarize the available evidence but also to provide practical guidance for policymakers, nursing educators, and practicing healthcare providers in designing targeted and accessible interventions.

This chapter focuses on systematically reviewing agronursing interventions for the management of hypertension in rural communities. The primary goal is to assess the practicality of these trades for reducing body weight, improving health information, and enabling behavior modification. In development, this review also examines the key components of agronursing interventions that contribute to the program's success. The coming around of this thing is anticipated to make a vital contribution to the enhancement of community nursing care, especially in rural settings, and to serve as a reference in the development of community-based prosperity programs.

## **Method**

The literature search process carried out in this literature review uses 4 databases: Semantic Scholar, PubMed, Springer, and Scopus, with a publication year range of

2020-2025. The search was conducted using several English keywords. In the search literature using the keywords "nursing intervention" AND "rural population" OR "hypertension in rural communities" OR "hypertension in agriculture" OR "health of agricultural workers" AND blood pressure management."

The article search process began with keyword identification, yielding 1,547 articles from databases and registries. After removal of duplicates and the initial exclusion, 849 articles remained for screening. Through title and abstract screening, 49 articles were obtained that met the research criteria. After a full review, 39 articles were excluded for not meeting the inclusion criteria, including language, topic, or the absence of an abstract. Finally, 10 articles were selected for analysis based on conformity with the study design, results, and other predetermined criteria.

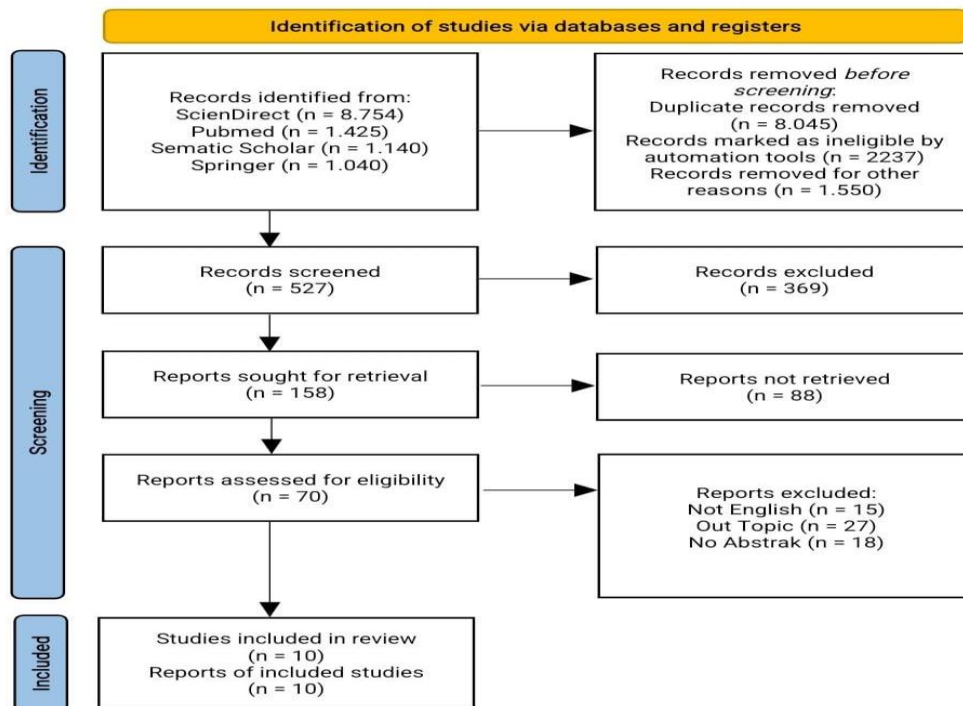


Figure 1. Flow Diagram of Analysis Literature Based on PRISMA (2022)

## Results

After reviewing various studies and articles, 10 studies were identified that showed the influence of agronursing interventions on reducing hypertension among farm workers, especially in agricultural areas. For more detailed information, see Table 1 for the results of the following literature analysis.

**Table 1. Result of Literature Review**

Variables	<i>M (SD)</i>	Sex	Age	Income	Educ.	Relig.
Sex	1.53 (.50)		.07	-.09	.02	.14
Age	31.88 (10.29)			.08	.19*	.20*
Income	2.60 (1.57)				.04	-.14
Educ.	3.44 (1.06)					-.29*
Relig.	1.21 (.30)					
Dist. Intol.	3.75 (1.19)					

No	Author/Year	Article Title/Journal Name/Volume	Sample	Method	Result	Limitation
1.	Susanto et al. / 2023	Management of Hypertension Using a Plant-Based Diet Among Farmers: Protocol for a Mixed-Methods Study <sup>8</sup> . JMIR Research Protocols / Vol. 12, e41146	Farmers with hypertension aged 45–65 years from 3 public health centers (PHCs) in Jember, East Java, Indonesia	Exploratory sequential mixed methods approach: Phase I (qualitative study involving semi-structured interviews) and Phase II (quantitative study including questionnaire development, survey, and randomized controlled trial)	Expected results include formulating a plant-based diet (PBD) menu tailored to local food sources, assessing the acceptability of PBD among farmers, estimating the prevalence of hypertension, and evaluating the effectiveness of a community-based nursing program using PBD to manage hypertension.	Potential Limitations include participant noncompliance with dietary adherence, possible bias in blood pressure measurements due to different enumerators or instruments, and the risk of dropout during a long-term intervention.
2.	Baldrige, A. et al. (2024).	Hypertension Treatment in Nigeria (HTN) Program: Evaluation of the Extension for Community Healthcare Outcomes (ECHO) Training Program <sup>10</sup> . BMC Primary Care/ Vol. 25:334.	Population: Healthcare workers (HCWs) from primary healthcare centers (PHCs) in Nigeria. Sample: 12 PHCs (out of 33 eligible PHCs) selected to participate in the ECHO program, with concurrent patient data used for evaluation.	Quantitative method using a quasi-experimental design. Data were analyzed using linear and logistic mixed models and statistical tests (e.g., chi-squared and Fisher's exact tests). The study evaluated changes in	Treatment Rates: No significant difference was found between the ECHO and non-ECHO groups. However, treatment rates improved over time in both groups. Control Rates: Similar trends were observed, but improvements were not statistically significant. Adherence to Protocols:	Small sample size for subgroup analyses (e.g., patients with diabetes). Potential bias in site selection for the ECHO program. A short study duration may not capture the long-term effects of the training program.

				hypertension treatment rates, control rates, and adherence to Nigeria's hypertension treatment protocol.	Adherence to hypertension treatment protocols increased slightly but was not statistically significant. Subgroup analysis for patients with diabetes showed no significant differences.	
3.	Jafar et al. (2020)	A Community-Based Intervention for Managing Hypertension in Rural South Asia <sup>11</sup> / NEJM / Vol. 382(8)	2,645 hypertensive adults aged $\geq 40$ from 30 rural communities in Bangladesh, Pakistan, and Sri Lanka.	Cluster-randomized controlled trial comparing a multicomponent intervention vs. usual care over 24 months.	The intervention group had a 5.2 mmHg greater reduction in systolic BP than the control group. BP control ( $< 140/90$ mmHg) was achieved in 53.2% of the intervention group vs. 43.7% in the control. The program was low-cost and integrated into public health systems.	Cannot isolate the effects of each intervention component. Short-duration, limited assessment of cardiovascular outcomes. Some behavior change might have occurred in the control group due to measurement exposure.
4.	Xiao et al. (2020)	Effectiveness of Lifestyle and Drug Intervention on Hypertensive Patients: A Randomized Community Intervention Trial in Rural China <sup>12</sup> . Journal of General Internal Medicine, 35(11)	2,912 hypertensive patients in rural communities of China	Randomized Community Intervention Trial (RCT) over 1 year. The intervention group received lifestyle education + antihypertensive medication; the control group received standard medication only	The intervention group had a significantly higher blood pressure control rate (59.3%) than the control group (25.2%). Significant reductions in both systolic and diastolic blood pressure were observed.	Conducted only in specific rural regions of China; findings may not be generalizable to other countries or settings with different health systems.
5.	Lukitasari et al. / 2021	An Intervention Study for Impact Assessment of Health Education by Empowered Community Health	73 CHWs and 164 hypertensive patients from the IHSP-Elderly program in Malang	Quasi-experimental with control and intervention groups,	After one month of structured health education for CHWs, there was a significant increase in patient	Short follow-up duration (1 month); further studies needed to assess long-term effectiveness.

		Workers in Improving Treatment and Diet Adherence in Hypertension <sup>13</sup> / Indian Journal of Community Medicine, Vol. 46, No. 4		pretest-posttest design; analyzed using Chi-square and t-tests	medication adherence (from 20% to 70%) and low-salt diet adherence (from 39% to 85%) in the intervention group; patient satisfaction also significantly improved	
6.	Kobashi et al. (2024)	Community-Based Intervention for Managing Hypertension and Diabetes in Rural Bangladesh <sup>14</sup> / Tropical Medicine and Health, Vol. 52	A total of 600 adults (aged 20–80) from six rural villages in Narail, Bangladesh.	A parallel intervention study using pre-post surveys. Two intervention groups (strong and weak) were compared with a control group. Non-healthcare staff conducted educational activities and health monitoring.	The strong intervention group showed a significant reduction in systolic BP (–7.3 mmHg) compared with the control group. No significant differences were found in diabetes outcomes. The intervention improved health behavior only in the strong group.	Not a cluster RCT; limited generalizability. Baseline differences existed between groups. Diabetes was measured via casual blood sugar, and only partial participation in seminars (40–60%).
7.	Sasti et al. / 2024	The Effect of the Slow Stroke Back Massage (SSBM) Technique on Reducing High Blood Pressure in Hypertension Sufferers <sup>15</sup> / Qistina Jurnal Multidisiplin Indonesia / Vol. 3 No. 2	78 hypertensive patients in the working area of Purwo Agung Public Health Center, Way Kanan Regency (39 intervention, 39 control)	Quantitative research with a quasi-experimental design using a one-group pre-test–post-test approach. Data were analyzed using an independent t-test.	The average blood pressure in the intervention group decreased from 147/81 mmHg to 129/78 mmHg after receiving the Slow Stroke Back Massage (SSBM) intervention. The study found a significant effect of the SSBM technique on lowering blood pressure (p-value = 0.000).	Did not involve randomization; no long-term follow-up; limited to one health center; generalizability may be limited due to the sample from a single location.
8.	Vedanathan et al. (2020).	Effect of Nurse-Based Management of Hypertension	Population: Hypertensive patients at two	The quantitative approach	The study found That Nurses showed a greater reduction in	- Location was limited to two health

		in Rural Western Kenya <sup>7</sup> . Global Heart. 2020; Vol 15(1): 77	health facilities in Western Kenya. Total of 1,059 patients (180 managed by nurses, 879 managed by clinical officers).	used an observational design with linear regression analysis to compare blood pressure outcomes between nurse-managed and clinical staff-managed groups.	systolic blood pressure (SBP) than clinicians after 3 months of intervention. Slope change in blood pressure management was better in the nurse group. Other factors, such as age and gender, did not significantly influence blood pressure outcomes.	facilities, making it difficult to generalize. - The study duration was relatively short (only three months), so long-term impacts were not evaluated. Potential bias in patient selection due to non-random distribution between the nurse and clinical staff groups.
9.	Pehopu et al. / 2025	Continuous Follow-Up Intervention of a Low-Salt Diet to Control Blood Pressure Among Older People With Hypertension in Rural Indonesia <sup>16</sup> . Clinical Epidemiology and Global Health / Vol. 32:101943	148 older adults (≥60 years) with hypertension from 4 community health centers in North Morowali Regency, Central Sulawesi, Indonesia (74 intervention, 74 control)	Quasi-experimental, pre- and post-test with control group; Intervention: 1x education + 2-month follow-up; Control: standard education only	Significant decrease in systolic and diastolic blood pressure and urinary sodium in the intervention group (p=0.000); no significant changes in the control group (p>0.05)	Manual food diary data are prone to bias (participants/families sometimes forgot to record meals); no control over all external dietary factors
10	Susanto et al. / 2024	Community-Based Occupational Health Promotion for Reducing Blood Pressure: A Randomized Control Trial of Agricultural Health Program <sup>17</sup> / Vol. 13, No. 4, Autumn 2024	120 children and their parents were randomly assigned to the control group (n=60) and the intervention group (n=60).	Quasi-experimental with a clinical trial design, prospective with 2 groups (intervention and control).	There was an increase in parental self-efficacy in asthma management, relapse prevention, and management in the intervention group. Additionally, there was a decrease in	A limitation of this study is that the respondents included a group aged <6 years; this may limit the generalizability of the results to the older group.

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emergency  
department visits,  
unscheduled  
outpatient visits,  
and asthma triggers  
in the home  
environment.

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## Discussion

Agronursing plays a vital role in managing hypertension among farmers by integrating agricultural knowledge with nursing care to address the unique health challenges faced by individuals in rural farming communities. Farmers are often exposed to prolonged physical labor, environmental stressors, irregular eating habits, and limited access to healthcare—all of which can contribute to elevated blood pressure. Agronurses, who are trained in both agricultural practices and community health, can identify these risk factors early and implement tailored interventions. They educate farmers on lifestyle modifications such as reducing sodium intake, increasing intake of potassium-rich foods from their own produce, promoting regular physical activity within daily farm routines, and encouraging stress-reduction techniques compatible with agricultural lifestyles<sup>18,19</sup>.

Moreover, agronursing bridges the gap between agricultural productivity and personal health by fostering sustainable health practices within farming environments. Through home visits, mobile clinics, and community workshops held at convenient times for farmers, agronurses deliver consistent hypertension monitoring, medication adherence support, and culturally appropriate health education. By leveraging their dual expertise, agronurses not only improve individual health outcomes but also strengthen the overall resilience of farming communities, ensuring that health management becomes an integral part of agricultural life rather than a separate concern. This holistic approach empowers farmers to maintain both their livelihoods and long-term cardiovascular health<sup>20,21</sup>.

Hypertension is a significant health problem among agricultural workers,

especially in rural areas with limited access to health services. As explained in the introduction, the high burden of hypertension in this group is often exacerbated by environmental and lifestyle risk factors such as unhealthy diet, irregular physical activity, work stress, and lack of health knowledge and support<sup>3,8</sup>. Therefore, agronursing-based interventions that integrate aspects of community nursing with cultural approaches and agrarian contexts are critical.

An analysis of 10 studies showed that hypertension management in farming and rural communities can be achieved through complementary approaches, including health education, lifestyle modification, involvement of health cadres, and non-pharmacological interventions tailored to local contexts. Research by Susanto et al. (2023) revealed that a plant-based low-salt diet significantly reduced blood pressure, especially if accompanied by structured monitoring<sup>8</sup>. This finding was supported by Pehopu et al. (2025), who emphasized the importance of matching dietary interventions to local resource availability and farmers' dietary habits to improve program effectiveness. However, Pehopu also identified significant challenges, including low patient compliance and possible biases in food consumption documentation, which could hinder program sustainability<sup>16</sup>.

In the realm of community-based health education, Lukitasari et al. (2021) state that the involvement of health cadres contributes to increased adherence to medication and a healthy diet, thereby lowering blood pressure<sup>13</sup>. This is reinforced by the findings of Kobashi et al. (2024), who compared intervention groups with different educational intensities, showing that the quality of training and intensity of intervention directly influenced the outcomes achieved. However, Kobashi also highlighted the need to standardize educational methods so that the program's effectiveness can be replicated consistently across different locations<sup>14</sup>.

Non-pharmacological approaches, such as the Slow Stroke Back Massage technique evaluated by Sasti et al. (2024), showed a significant reduction in blood pressure, suggesting potential as an alternative therapy that can be integrated into primary care, especially in areas with limited access to medicine<sup>15</sup>. However, the study's limited design, conducted at a single site without randomization, reduces the generalizability of the results and calls for further studies with a more robust design.

Nursing personnel also play an important role in the management of

hypertension. The study of Vedanthan et al. (2020) reported that patients treated by nurses experienced a greater reduction in blood pressure than patients treated by clinicians<sup>7</sup>. This finding is in line with the study by Jafar et al. (2020) in South Asia, which implemented a community-based multicomponent approach and showed that strengthening the role of nurses and other health workers at the community level significantly increased the effectiveness of hypertension management<sup>11</sup>.

On the other hand, research by Baldrige et al. (2024) on the ECHO technology training program in Nigeria has not shown a significant effect on treatment or blood pressure control. The short duration of the study and the inconsistency in the training implementation were suspected to be factors that hindered the program's success<sup>10</sup>. Nonetheless, this training technology approach still has potential to be further developed, especially in areas with limited access to conventional training, through improvements in planning and implementation.

Overall, the community-based agronursing intervention proved effective in reducing blood pressure in farmers through a combination of education, strengthening local capacity, lifestyle modification, and integration of the agrarian context. The advantage of this approach lies in its relevance to local conditions and the active involvement of the community in the promotive and preventive process. However, the program's success is highly dependent on patient compliance, the sustainability of the intervention, and the quality of training and mentoring for health workers and cadres in the field.

## **Conclusion**

Based on a literature review of studies on agronursing interventions to reduce hypertension among agricultural workers, the agronursing approach has significant potential to manage and reduce blood pressure among farmers. The interventions implemented include community-based health education, promotion of plant-based diets, relaxation techniques such as slow-stroke back massage, and the empowerment of local health cadres who act as liaisons between health workers and the community. In addition, interventions that consider the cultural and social aspects of agricultural communities have proven more effective at increasing medication adherence and promoting healthy lifestyle behaviors. The active involvement of nurses in

implementing agronursing also positively impacts monitoring and follow-up of hypertension patients.

However, challenges in implementing this intervention remain, including limited resources and the need to strengthen local health workers' capacity. Therefore, the development of agronursing programs that are sustainable and adaptive to local conditions is significant to achieve optimal results in managing hypertension in agricultural workers. Further research is needed to assess the long-term effectiveness of agronursing interventions and their integration into village health systems to become a model that can be replicated in different areas with similar populations.

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Through this collaboration, we not only enriched the work but also broadened our understanding of the problems under investigation. Working in this manner improves both scholarly accomplishment and individual growth. It is our sincere hope that this literature review will benefit future scholars, practitioners, and policymakers who want to advance knowledge and solutions in this area.

### **Conflict of Interest**

None

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