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Public Health Policies and Clinical Risk Factors in Type 2 Diabetes: A Correlational Study Based on the Perception of Professionals from a Peruvian Hospital

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Abstract
This study aimed to explain the influence of public health promotion policies on risk factors in diabetic patients at a hospital in Trujillo, Peru. A quantitative approach was applied, with a basic, non-experimental, cross-sectional, and correlational design, based on a census sample of 50 healthcare professionals. Two Likert-scale questionnaires were used, validated by experts and demonstrating adequate reliability ($\alpha > 0.80$). Statistical analysis included ordinal logistic regression. The results revealed that public health policies significantly influence risk factors ($p < 0.05$), with a Nagelkerke R^2 of 19.3%. At the dimensional level, significant influence was found in the technical and social components, whereas the political and participatory dimensions showed no significant effects. It is concluded that strengthening technical aspects and addressing social determinants are essential to reduce risk factors in patients with type 2 diabetes.
Keywords: *Health policy, patient, disease, risk factors in diabetes.*

INTRODUCTION

Diabetes mellitus is a chronic, non-communicable disease that alters metabolism, leading to cardiac, renal, vascular, and neurological complications. According to WHO (2023), 62 million people in the Americas (422 million worldwide) suffer from this disease, mainly in low- and middle-income countries, with 244,084 attributable cases annually and 1.5 million global deaths. As reported by PAHO (2023), it is the second leading cause of disability worldwide, with Latin America showing the greatest loss in healthy life years. Treatments involve a high financial burden, hindering humanitarian development. PAHO (2023) states that in 2019 the standardized mortality rate ranged from 82.6 per 100,000 in Guyana to 7.2 in Canada.

Health policies are essential. Jönsson et al. (2023) highlight the Swedish primary care model as key to improving health and reducing inequalities. Torres et al. (2021) indicate that in Latin America, with fragmented systems, Argentina has implemented primary care strategies linked to risk factors. Sacks et al. (2021) emphasize the INFORMAS program applied in Chile since 2015, which includes informative food labeling. Ong et al. (2023) report a diabetes prevalence of 5.5% in Canada, 7.3% in the U.S., and 7.7% in Peru, underscoring the need to identify risk factors for early treatment.

In Peru, the Ministry of Health (2017) developed health promotion policies in a complex context due to its geographical and cultural diversity. Inequalities in resources lead to disparities in disease and quality of life. INEI (2021) reports higher prevalence on the coast (5.8%), followed by the Amazon (4%) and the highlands (3.3%); it affects women (5.4%) more than men (4.5%). Risk factors include overweight, obesity, family history, sedentary lifestyle, gestational diabetes, age over 35, and poor dietary habits (American Diabetes Association, 2022). In La Libertad, Trujillo accounts for 59% of cases, followed by Chepén, Ascope, and Virú (INEI, 2022).

This research is based on the report of the Ministry of Health (2017), the WHO guidelines (2020), and PAHO's practical guide (2013). Its value lies in proposing policies that reduce risks in diabetic patients through replicable strategies, valid instruments, and applicable solutions. Its practical contribution is to design improvements in health promotion policies focused on prevention. It is feasible, as the author has the knowledge, resources, and time necessary to achieve the objectives, promoting timely and equitable care for this disease.

In this regard, the general problem is posed: ¿How do health promotion policies influence risk factors in diabetic patients at a hospital in Trujillo? And the general objective: To explain how public health policies influence risk factors in diabetic patients at a hospital in Trujillo.

Various studies have shown that the effectiveness of public health policies depends both on their design and on their contextualized and participatory implementation. Dankoly et al. (2023) analyzed type 2

diabetes management in Oujda, Morocco, concluding that healthcare professionals recognize both benefits and challenges in the integrated approach applied in primary care. Among other factors, they identified the need for specialized staff in physical activity and nutrition as a key element for optimizing disease management outcomes. Similarly, Keng et al. (2021) demonstrated that, in a rural hospital in Malaysia, only a fraction of diabetes mellitus patients achieved adequate therapeutic goals. Their analysis revealed that factors such as annual HbA1c checks (AOR = 2.30; p = 0.039) and age 58 or older (AOR = 2.50; p = 0.005) increased the likelihood of good glycemic control. Consequently, they recommended strengthening health education and medical monitoring in rural areas to improve treatment for non-communicable diseases such as diabetes, hypertension, and dyslipidemia.

For their part, Sen et al. (2023) conducted research in Bangladesh to examine the influence of living standards on the risk of diabetes and hypertension, mediated by body mass index (BMI). In a sample of 11,961 adults, they found that higher living standards were associated with increased prevalence of diabetes (18.5%), hypertension (33.5%), and comorbidity of both (9.7%). These levels increased the risk of diabetes by 133% (OR = 2.22), leading the authors to highlight the need for awareness campaigns about the risks associated with rising purchasing power and overweight.

Globally, Tuomilehto et al. (2023) warned that even in developed countries, there are significant barriers to preventing type 2 diabetes, despite having more resources. According to their analysis, socioeconomic inequalities continue to hinder the effective implementation of preventive interventions. However, results in low- and middle-income countries show some promise, prompting the authors to propose a strong global political commitment, comparable to the WHO Framework Convention on Tobacco Control.

Regarding the quality of the work environment as a relevant variable in service provision, Althumairi et al. (2023) evaluated the satisfaction of 143 primary care providers in Saudi Arabia. They identified high levels of satisfaction in supervision and patient care, but also noted major deficiencies in areas such as contingent rewards and communication channels. The results suggest that strengthening these areas could significantly improve care quality and healthcare staff commitment to institutional policies.

From an institutional perspective, Shrestha et al. (2022) examined the implementation of health policies for non-communicable diseases in Nepal. Based on document analysis and qualitative interviews, they identified multiple obstacles, including limited political execution, poor interagency coordination, lack of qualified personnel, and low access to services. The gaps found between regulatory formulation and operational practice support their recommendation to adopt multisectoral approaches and to strengthen institutional capacities.

At the regional level, Lovás et al. (2021) analyzed policies on nutrition, physical activity, and diabetes in the 28 countries of the European Union. Using Eurostat data and national surveys, they determined that while there are correlations between active policies and lower diabetes prevalence, their impact remains insufficient. The study concludes that comprehensive and sustained interventions are required, as isolated actions are ineffective in reducing the disease burden.

From a theoretical standpoint, the conceptual framework of this research is grounded in public health promotion policies aimed at equity and population well-being. In this regard, the World Health Organization promotes the "Health in All Policies" approach, which seeks to integrate health concerns into all governmental decisions, minimizing adverse effects and generating intersectoral synergies (Yang et al., 2022). This paradigm shifts from a traditional curative model to a preventive one, although in practice policies still prioritize the control and treatment of chronic diseases (Zhang & Ran, 2022). Health governance, in this context, emerges as a strategic tool to address structural and operational challenges within the health system (Yang et al., 2022).

In this regard, health policies as governance instruments play an essential role in reducing inequalities and improving social well-being. However, the literature tends to focus on their immediate effects, overlooking their transformative potential at a structural level (Zhang & Ran, 2022). Therefore, it is a priority to evaluate such policies and strategically plan resource allocation (Akhnif et al., 2020).

Likewise, healthcare system financing requires robust and sustained political dialogue among the various stakeholders involved. This is especially crucial in resource-limited countries, where participatory management of the political process must be institutionalized (Akhnif et al., 2020). For health promotion to be effective, it must be embedded in the intersectoral agenda, supported by legislative frameworks, economic incentives, and socially regulated organizational structures (Tochukwu, 2022).

On the same level, health education is oriented toward collaborative activities that prevent disease and empower communities, while health communication strengthens informed decisions through oral and written strategies (Tochukwu, 2022). Health policy decisions must combine legislative, economic, and

regulatory mechanisms that act together with the social, physical, and economic determinants that condition individual health (Tochukwu, 2022).

Social determinants of health, such as income, educational level, or employment status, explain much of the inequality in healthcare access and quality. Structural interventions focused on community development, equitable fiscal policies, and labor inclusion programs emerge as effective strategies to reduce these gaps (Zhang & Ran, 2022). Within this framework, structural racism has been identified as a critical cause of health disparities, expressed in unequal access to services, deterioration of general well-being, and patient-physician relationships mediated by bias. Overcoming this issue requires the design and implementation of sustained, interdisciplinary, and culturally sensitive strategies (Boyd et al., 2020).

Likewise, citizen empowerment and social participation have proven to be key mechanisms for generating sustained changes in the physical and social environment, facilitating the adoption of healthy decisions. In contexts where healthy choices are accessible and prioritized by public policies, individuals tend to incorporate them more easily into their daily habits. This reinforces a perspective where health is understood as a human right and its promotion as a comprehensive sociopolitical process (Tochukwu, 2022). In this vein, Walt and Gilson (1994) proposed an explanatory model that articulates the actors, processes, and levels of the political and health system, which is especially useful in contexts marked by structural adjustment policies.

From a behavioral approach, the theory of reasoned action by Fishbein and Ajzen (1980) posits that human behavior depends on the interaction between attitudes, subjective norms, and beliefs, influenced by sociocultural factors. This perspective helps explain how health decisions are made. In this vein, the Ottawa Charter and the Alma-Ata Declaration established, since 1978, primary health care as the path toward universal coverage, emphasizing equity and social participation.

The 2030 Agenda reinforces this comprehensive approach by including social, economic, and environmental determinants in sustainable health strategies. In this context, type 2 diabetes mellitus (T2DM) represents a critical challenge. This metabolic disease, characterized by insulin resistance or deficiency, entails high healthcare and social costs if not adequately treated (Hernández González & González Mendoza, 2020). According to the American Diabetes Association (2021), the different types of diabetes require differentiated interventions. T2DM demands personalized therapies targeting multiple organs and endocrine cells. In T1DM, the challenge lies in understanding the autoimmune destruction of β-cells. Both forms involve micro- and macrovascular complications, as well as risks in asymptomatic phases such as ketoacidosis or hyperosmolar coma (Beydag-Tasöz et al., 2023; Poznyak et al., 2020). Risk factors include hypertension, dyslipidemia, obesity, altered heart rate, and uric acid, whose variability is associated with cardiovascular events and vascular damage (Ceriello et al., 2021; Verma et al., 2020).

Significant variations in body weight are associated with higher risk of mortality and cardiovascular events. Additionally, decreased heart rate variability has been observed in people with T1DM, T2DM, and prediabetes, indicating cardiac autonomic dysfunction (Coopmans et al., 2020). From a genetic theory perspective, both T1DM and T2DM are known to have hereditary components, although their mechanisms differ. In T2DM, the interaction between genetics and the social environment allows for more precise preventive approaches (Heredia et al., 2022).

The Ecological Model for Health Promotion (EMHP) provides an integrative framework by organizing determinants into five levels: intrapersonal, interpersonal, organizational, community, and public policy. This model facilitates the design of multicomponent interventions to promote healthy behaviors through educational campaigns, planning, and efficient resource management (Francis, 2025).

International experiences reinforce this perspective. In Thailand, political leadership and mass campaigns improved health outcomes (Bragge et al., 2023). In Canada, a comprehensive program reduced mortality from chronic diseases (Sardana et al., 2024), and in Europe, effective risk communication helped reduce risk factors (Bakhit et al., 2024). Epistemologically, the study is based on positivist and post-positivist paradigms. The former seeks empirical and objective evidence (Khanday et al., 2024; Habibani & Fatimah, 2024), while the latter promotes diverse and contextualized methodological approaches (Mahato, 2024; Pylypenko, 2022), reaffirming the impact of public policies on diabetes risk factors.

METHODOLOGY

This research, grounded in the positivist paradigm, adopted a quantitative approach based on the hypothetical-deductive method, aiming to establish causal relationships between public health policies and risk factors in diabetic patients. It was a basic study focused on generating theoretical knowledge with applied projection, with a descriptive-correlational level and a non-experimental, cross-sectional design.

The study population consisted of 50 healthcare professionals from a public hospital in the city of Trujillo, selected through a census sample. The methodological decision to apply the instrument to healthcare personnel rather than directly to patients was based on the ethical, administrative, and regulatory restrictions currently in force in Peruvian hospitals. Accessing direct clinical information from patients with chronic diseases such as type 2 diabetes mellitus requires more rigorous protocols, including approval by Research Ethics Committees, individualized informed consent, protection of sensitive clinical data, and additional authorizations from the Ministry of Health or the National Institute of Health. These requirements would have affected the operational feasibility and timeline of the study. Therefore, the decision was made to gather the technical perception of medical and support staff, who possess clinical knowledge, experience managing diabetic patients, and the capacity to identify the incidence of risk factors from a professional perspective.

For data collection, two structured Likert-type questionnaires were used. The first, aimed at evaluating public health policies, consisted of 30 items distributed across four dimensions: political, technical, social determinants, and empowerment and social participation. The second questionnaire, focused on risk factors, included 16 items related to blood pressure, body weight, lipid profile, uric acid levels, and heart rate.

The technique employed was a self-administered survey, whose validity was supported by expert judgment in public health and health policy, and empirically validated through exploratory factor analysis, achieving an acceptable Kaiser-Meyer-Olkin value (KMO > 0.5). The internal reliability of both instruments was assessed using Cronbach's Alpha coefficient, yielding values above 0.70, indicating acceptable item consistency.

For data processing, descriptive and inferential statistical techniques were applied, with emphasis on ordinal logistic regression to evaluate the effect of health policies on risk factors. Processing was carried out using Microsoft Excel and SPSS version 28.0. Finally, the study obtained institutional authorizations and informed consent from participants, in compliance with the principles of anonymity, confidentiality, voluntariness, and methodological rigor, according to the ethical guidelines established by Peruvian national regulations for health research.

RESULTS

The results of this research are presented below:

Table 1 Diagnosis level of the study's main variables

	Public health policies		Risk factors	
	f	%	f	%
Good	16	32%	5	10%
Regular	30	60%	45	90%
Deficient	4	8%	0	0%
Total	50	100	50	100

Note. The information is based on the application of the questionnaire designed to measure the main variables.

Table 1 shows that most respondents rated public health policies at a regular level (60%), followed by 32% who consider them good. Only 8% perceive them as deficient. This suggests that, although progress is perceived in policy implementation, there are still limitations preventing the strategy from being rated as optimal. On the other hand, regarding risk factors, a clear concentration is observed at the regular level (90%), indicating that although efforts exist to mitigate such risks, the results have not yet reached optimal levels of clinical control or prevention in diabetic patients. This finding reveals a potential gap between the implemented policies and their perceived effectiveness in clinical practice.

Table 2 Level of the dimensions of public health policies

Level of the dimensions of public health policies	Policy		Technical		Social determinants		Empowerment and social participation	
	f	%	f	%	f	%	f	%
Good	15	30%	23	46%	15	30%	9	18%
Regular	31	62%	23	46%	30	60%	35	70%

Deficient	4	8%	4	8%	5	10%	6	12%
Total	50	100%	50	100%	50	100%	50	100%

Note. The information is based on the application of the questionnaire designed to measure the main variables.

When disaggregating public health policies into their four dimensions, it is identified that the political (62%) and empowerment and social participation (70%) dimensions show the highest percentage at the regular level, indicating an intermediate perception regarding their execution and results. Notably, the technical dimension reaches 46% at the good level, which could be attributed to the training and commitment of healthcare personnel. However, the dimensions of social determinants (10%) and again empowerment (12%) present the highest percentages at the deficient level, suggesting shortcomings in the integration of socioeconomic factors and in the active participation of the community in health promotion. These results highlight the need to strengthen intersectoral coordination and social inclusion in promotional strategies.

Table 3 Level of the dimensions of risk factors in diabetic patients

Level of the dimensions	Blood pressure		Body weight		Lipid disorder		Uric acid		Heart rate	
	f	%	f	%	f	%	f	%	f	%
Good	1	2%	12	24%	2	4%	14	28%	11	22%
Regular	33	66%	37	74%	27	54%	35	70%	37	74%
Deficient	16	32%	1	2%	21	42%	1	2%	2	4%
Total	50	100%	50	100%	50	100%	50	100%	50	100%

Note. The information is based on the application of the questionnaire designed to measure the main variables.

In relation to the dimensions of risk factors, the regular level predominates in all categories, especially in body weight (74%) and heart rate (74%), reflecting moderate but not optimal stability in patients' clinical conditions. On the other hand, it is notable that lipid alteration shows 42% at the deficient level, followed by blood pressure with 32% at that same level, indicating critical areas requiring priority intervention. The dimension with the best relative performance is uric acid, with 28% at the good level. These findings confirm that, although there is partial control of some risk factors, there are still significant challenges in achieving comprehensive and effective health management in diabetic patients.

General Hypothesis Testing

Hi: Public health policies directly and significantly influence risk factors in diabetic patients in a hospital in Trujillo.

Ho: Public health policies do not directly and significantly influence risk factors in diabetic patients in a hospital in Trujillo.

Table 4 Causal relationship between main variables

Public health policies		Risk factors in diabetic patients			Total
		Deficient	Regular	Good	
Deficient	N	0	4	0	4
	%	0%	8%	0%	8%
Regular	N	0	28	2	30
	%	0%	56%	4%	60%
Good	N	0	13	3	16
	%	0%	26%	6%	32%
Total	N	0	45	5	50
	%	0%	90%	10%	100,0%

Ordinal logistic regression

Model	**Log-likelihood**	**Chi-square**	**gl**	**Sig.**	**R^2 Nagelkerke**

Intersection	32,508				
Final	27,670	4,838	1	,028	19,3%

Link function: Logit.

Table 4 shows that the level that matches and has the highest acceptance is regular, with 56% for both variables studied; additionally, at the good level, both variables also coincide at 6%. The influence between both variables is also shown through the ordinal logistic regression test (Sig<0.05), and the model obtained, according to the Nagelkerke R^2 test, equals 19.3%, indicating that the model improves the levels of risk factors in diabetic patients.

Figure 1 Structural regression showing how public health policies explain risk factors in diabetic patients

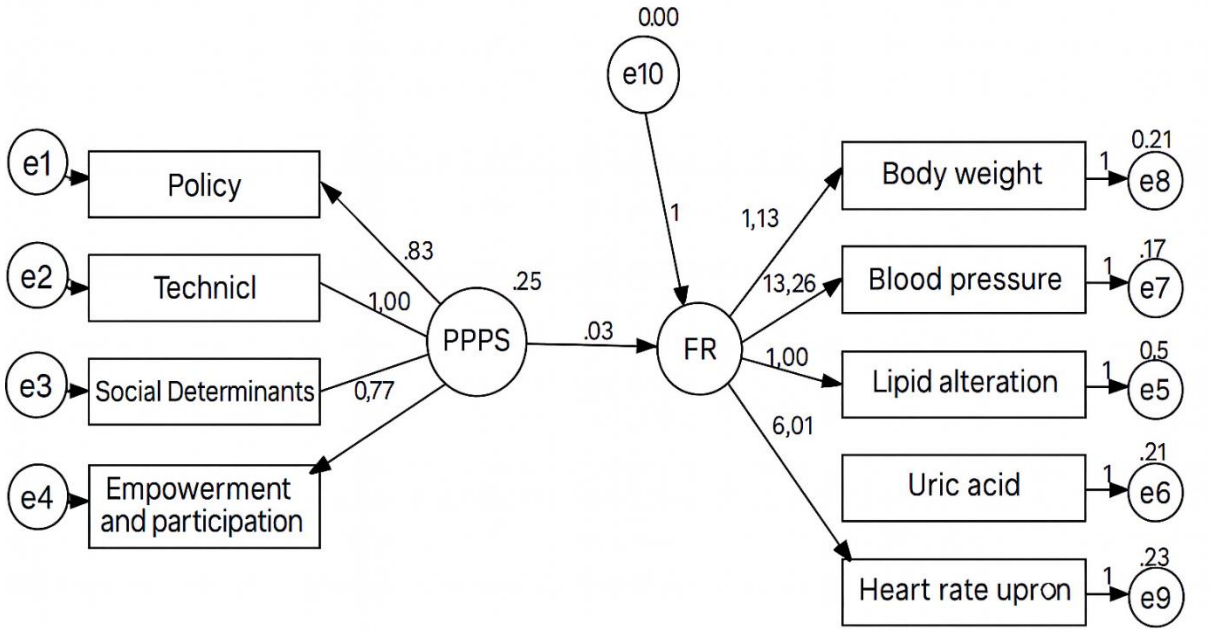

Figure 1 shows the integrative model of the structural equation that examines the causal relationship of the first main variable on the risk factors. The results show the absolute fit measures, including: X^2/df = 0.760 (needs improvement), Root Mean Square Error of Approximation (RMSEA) = 0.00 (acceptable), Comparative Fit Index (CFI) = 1.000 (within parameters), Tucker-Lewis Index (TLI) = 1.118 (ideal), and Standardized Root Mean Square Residual (SRMR) = 0.022 (acceptable). These values indicate that the structural model is acceptable, though with some indicators needing improvement.

Inferential Data to Test the Specific Hypotheses

These affirm or deny the influence between the dimensions of public health policies and risk factors in diabetic patients.

Table 5 Verification of specific hypotheses

Specific hypothesis	Sig. (p)	R^2 Nagelkerke	Result
Political dimension	0.193	0.07	Not Significant
Technical dimension	0.009	0.265	Significant
Social determinants	0.01	0.261	Significant
Empowerment and participation	0.205	0.066	Not Significant

The inferential results show that not all dimensions of public health policies exert a significant influence on risk factors in diabetic patients. In particular, the technical ($p = 0.009$; $R^2 = 0.265$) and social determinants ($p = 0.010$; $R^2 = 0.261$) dimensions show a statistically significant and direct influence, explaining approximately 26% of the variability in risk factors. This suggests that actions related to technical quality of care and consideration of structural factors such as education, employment, or income are contributing significantly to health risk control in this population.

In contrast, the political ($p = 0.193$; $R^2 = 0.070$) and empowerment and social participation ($p = 0.205$; $R^2 = 0.066$) dimensions did not show a significant relationship with the risk factors. These figures highlight limitations in the effectiveness of the normative or strategic component, as well as in mechanisms for active participation of patients or communities in managing their own health. The low incidence of these dimensions suggests that, while they may be normatively present, they have not yet translated into tangible or appropriate interventions in the evaluated hospital setting.

Taken together, these results underscore the need to strengthen the technical-operational component and the approach to social determinants, while also urging the rethinking and implementation of effective mechanisms for participation and health governance, in pursuit of a comprehensive and sustainable improvement in reducing risk factors among patients with chronic diseases such as diabetes.

Figure 2 Causal relationship between the dimensions of the first main variable and risk factors

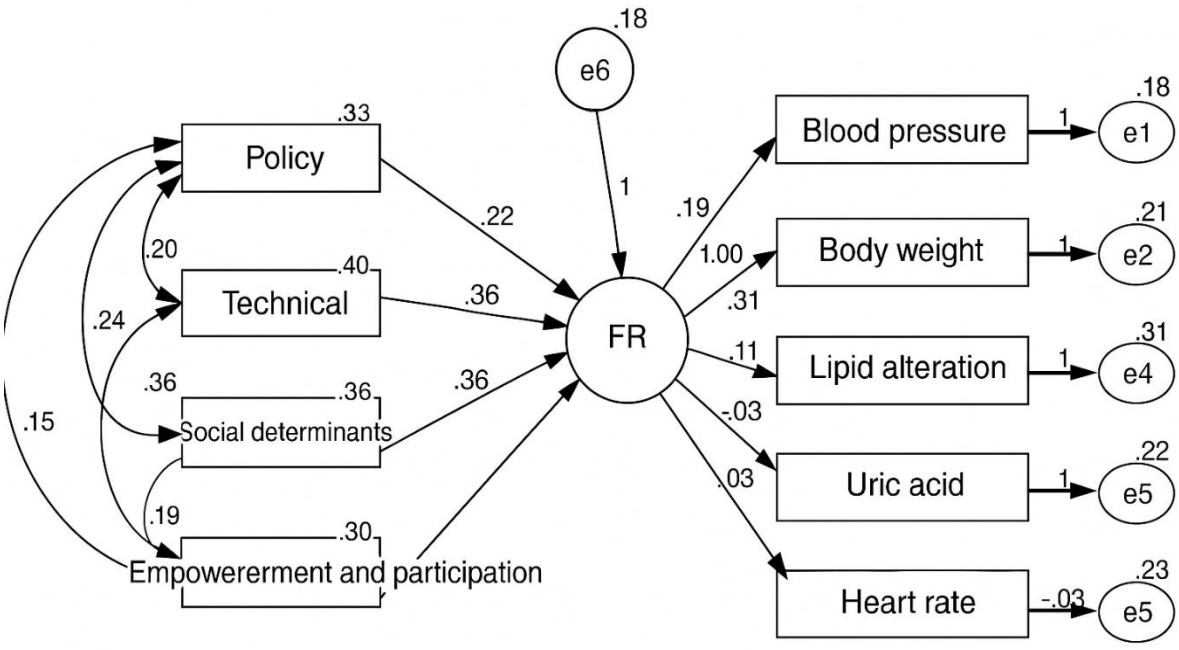

Figure 2 shows the structural equation that examines the causal relationship of the dimensions of the first main variable on the risk factors in diabetic patients. The results show the absolute fit measures, including: $X^2/df = 0.814$ (needs improvement), RMSEA = 0.00 (acceptable), CFI = 1.000 (within parameters), TLI = 1.091 (ideal), and SRMR = 0.023 (acceptable). These values show that the structural model is acceptable, though with some indicators needing improvement.

DISCUSSION

The discussion is a key component of this study as it enables the comparison of findings with previous research, the analysis of theoretical frameworks, and the assessment of the author's contribution in relation to the objectives. Regarding the general objective—to explain how public health policies influence risk factors in diabetic patients at a hospital in Trujillo—a significant causal relationship between the variables was identified (Sig < 0.05). According to Table 4, both variables coincided at the regular level

with 56% and at the good level with 6%. The ordinal logistic regression revealed that the model explained 19.3% of the variance (Nagelkerke R^2). The structural model showed overall adequacy with some indicators requiring improvement (X^2/df = 0.760, CFI = 1.00, TLI = 1.118, SRMR = .022, RMSEA = .000). These results are consistent with Tochukwu (2022), who noted that health communication empowers individuals to make informed decisions. Francis (2025) demonstrated that effective public policies prevent risk factors through campaigns, efficient resource management, and evidence-based evaluation. In Thailand, Bragge et al. (2023) found that governmental action, public education, and political leadership improved population health. It is concluded that public health policies play a key role in risk prevention, although limitations remain that affect equity and quality of care, necessitating critical analysis and continuous improvement.

The statistical analysis of this study revealed that the overall influence of public health policies on diabetes risk factors, as indicated by the Nagelkerke R^2 value of 19.3%, explains a modest but meaningful proportion of the variance in clinical outcomes. While this percentage may appear relatively small, in the context of chronic disease prevention it represents a relevant effect, as even incremental improvements in policy effectiveness can translate into substantial population-level health benefits over time. The statistically significant p-values ($p < 0.05$) obtained for the technical and social determinant dimensions indicate that the observed associations are unlikely to be due to chance, reinforcing the reliability of these findings. In practical terms, these results suggest that targeted interventions in these dimensions could measurably reduce the prevalence or severity of modifiable risk factors, thereby improving patient outcomes and optimizing resource allocation within the healthcare system.

Regarding Specific Objective 1, which was to identify the diagnostic level of public health policies (PHP) and their dimensions, the results showed that 60% of surveyed professionals perceived the PHP at a regular level, followed by good (32%) and deficient (8%). Among the dimensions, the political (62%) and empowerment and social participation (70%) dimensions were most frequently rated as regular; the technical dimension was rated as good (46%), while the deficient level was more prevalent in social determinants (10%) and participation (12%). These findings align with Keng et al. (2021), who emphasized the importance of PHPs in chronic disease management, although limitations in dissemination persist in rural areas of Malaysia. Similarly, Althumairi et al. (2023) reported satisfaction among healthcare professionals in Saudi Arabia but identified gaps requiring action from the Ministry of Health to strengthen health promotion.
In contrast, studies by Tuomilehto et al. (2023) and Shrestha et al. (2022) revealed disparities in PHP effectiveness between developed and developing countries, pointing to deficiencies in coordination and resource allocation. Lovás et al. (2021) highlighted advances in preventive policies within the European Union but underscored the need for a broader matrix to address the diabetes burden. Apóstol et al. (2022) identified inefficiencies in health waste policies in the Philippines and the need for integrated management systems. Moreover, Yang et al. (2022) and Zhang and Ran (2022) agreed that policies must prioritize health promotion with an intersectoral approach and effective governance to meet current challenges.
Based on prior research and theoretical frameworks, it is evident that public promotion policies play an essential role in patient care across various countries, especially in Peru. Specifically, in the hospital of Trujillo, while policies exist for health promotion in patients with chronic morbidity, optimization has not yet been achieved. There remains a need to readjust these policies to ensure comprehensive care and improve access, avoiding operational or bureaucratic barriers.
Regarding Specific Objective 2, which aimed to identify the diagnostic level of risk factors in diabetic patients at a hospital in Trujillo, results showed that the predominant level was regular (90%), followed by good (10%), indicating partial but suboptimal progress. Among the evaluated dimensions, regular level was most frequent in body weight and heart rate (74%), while the deficient level was more prevalent in lipid alteration (42%) and blood pressure (32%), and the good level in uric acid (28%). These findings align with Dankoly et al. (2023), who highlighted the need to prioritize professionals with expertise in physical activity and nutrition to improve chronic disease control. Conversely, Sen et al. (2023) indicated that rising risk factors in Bangladesh are linked to improved living standards, necessitating education campaigns. Type 2 diabetes (T2DM), as an endocrine disorder, involves insulin resistance or secretion deficit (Hernández & González, 2020). From a genetic theory perspective, Heredia et al. (2022) emphasized that its polygenic and environmental origins allow for personalized interventions. Moreover,

international studies such as Sardana et al. (2024) in Canada and Bakhit et al. (2024) in Europe showed that comprehensive prevention programs and effective communication significantly reduce risk factors and mortality. Thus, timely and sustained prevention can mitigate risks in chronic diseases, highlighting the importance of awareness strategies and education to improve self-care and timely access to healthcare services.

For the specific inferential objectives, which were to determine how the dimensions of public health policies (political, technical, social determinants of health, and empowerment and social participation in health) influence risk factors in diabetic patients at a hospital in Trujillo (2025), the results revealed varying degrees of impact. In Table 5, no significant incidence was found between the political dimension and the risk factors in diabetic patients, as the cross-tabulation showed the most frequent matching level to be regular at 28%, and a smaller match at the good level with 4%. The ordinal logistic regression test confirmed no significant influence (Sig > 0.05), and the model yielded a Nagelkerke R^2 value of 7.0%. In contrast, Table 6 showed a slight causal and significant influence of the technical dimension on risk factors, with 44% matching at the regular level and 8% at the good level. The logistic regression confirmed this influence (Sig < 0.05), and the model's Nagelkerke R^2 was 26.5%. Table 7 also reflected a slight causal and significant influence between the social determinants of health and the risk factors in diabetic patients, with a 54% match at the regular level and 4% at the good level. The logistic regression confirmed this influence (Sig < 0.05), and the Nagelkerke R^2 value of 26.1% demonstrated that the model improved the levels of risk factors. Conversely, Table 8 showed no significant incidence between the empowerment and social participation dimension and the risk factors, with 60% of cases at the regular level. The logistic regression also showed no significant influence (Sig > 0.05), and the Nagelkerke R^2 value was 6.6%, indicating that the model did not significantly improve risk levels.

These findings align with the rationale behind health promotion policies, which are instrumental for rational resource allocation and improved health policy planning (Akhnif et al., 2020). Such policies are directly related to the materials and strategies used in patient care based on individual risk profiles. The formulation of sound and healthy public policies goes beyond disease absence. Health promotion places health issues on the agenda of policymakers across all sectors, urging them to recognize the disease burden on individuals, families, populations, and communities.

Regarding the technical dimension, it is supported by various preventive strategies targeting risk factors, including health communication within the framework of social marketing. Health communication is understood as a dialogue involving healthcare, written tools, and oratory techniques, aimed at empowering individuals and groups to make better decisions (Tochukwu, 2022). The dimension of social determinants of health is equally crucial in reducing risk factors, as there are evident disparities between individuals with education and financial means and those without. Individuals with knowledge tend to care more about their health. Scholars and policymakers have proposed that some social factors—such as "tax credits, pensions, disability or rehabilitation benefits, maternity or child allowances, unemployment support, housing policies, labor markets, and care centers"—are essential social determinants of health (Zhang & Ran, 2022).

Moreover, the empowerment and social participation dimension plays a key role in maintaining a healthy body by focusing on social change and adjusting the physical, social, and fiscal environment to foster health promotion capacity. Rather than changing individual behavior, this approach targets changes in social behavior and environment (physical, economic, and social). Thus, health promotion is a social and political process that regards health as a human right and views the protection of population health as a prerequisite for social progress (Tochukwu, 2022). It is important to stress that health promotion policies across all dimensions contribute to reducing patient risk factors. Therefore, multiple strategies should be pursued to foster behavioral changes among vulnerable populations, not just among those already accessing care. Access must be ensured for all individuals, without discrimination.

The findings of this study carry significant implications for the formulation and implementation of institutional policies within hospital settings. First, the evidence that the technical and social dimensions of public policies significantly influence risk factors associated with type 2 diabetes underscores the need to strengthen health personnel training in areas such as comprehensive clinical management, biomedical indicator monitoring, and effective communication with vulnerable populations. It is recommended to design continuous professional development plans emphasizing interdisciplinary and primary care–centered approaches. Second, social determinants of health—such as family environment, economic conditions, and health education—must be incorporated transversally into chronic disease prevention and

control programs. This requires coordination of health policies with other government sectors, adopting the "Health in All Policies" framework promoted by the WHO.

CONCLUSIONS

From the general objective, it was concluded that public health policies have a direct and positive influence on the risk factors in diabetic patients ($p = 0.28$). Moreover, based on the ordinal logistic regression model, the influence of health promotion policies on risk factors was supported (Nagelkerke $R^2 = 19.3\%$). These results highlight the importance of strengthening health policies to improve and reduce associated risk factors.

Regarding the level of health promotion policies, the most prevalent level reported by respondents was "moderate," with 60% of participants indicating this. Similarly, this predominance was reflected in specific dimensions, particularly in the political (62%) and empowerment and social participation (70%) dimensions. These findings reveal ongoing efforts to optimize health promotion policies, though challenges persist in achieving equity in healthcare delivery and ensuring meaningful citizen participation.

With respect to the objective of identifying the diagnostic level of risk factors in diabetic patients, the findings confirmed that most participants rated it as moderate (90%). This same level was also dominant across dimensions, especially in body weight and heart rate (74%). These outcomes demonstrate determined efforts to ensure continuous monitoring for patients with chronic conditions, despite limitations in resources and materials.

It was confirmed that the political dimension does not significantly influence risk factors ($p > 0.05$). Furthermore, the model derived from the Nagelkerke $R^2 = 7.0\%$ test indicates that this dimension exerts no measurable influence on the levels of risk factors, highlighting the need to review and enhance health promotion policies to produce greater effects on dependent outcomes.

In contrast, the technical dimension was found to have a statistically significant influence on risk factors ($p < 0.05$), with a model result of Nagelkerke $R^2 = 26.5\%$, suggesting a modest influence. These findings suggest that while healthcare professionals are fulfilling their roles, external limitations continue to restrict their effectiveness.

The social determinants of health also exhibited a significant influence on risk factors ($p < 0.05$), with a Nagelkerke $R^2 = 26.1\%$, indicating a modest but relevant impact. This finding confirms that social determinants have a strong connection with the health outcomes of patients.

Lastly, the empowerment and social participation dimension did not show a statistically significant influence on risk factors ($p > 0.05$), and the associated model reported a Nagelkerke $R^2 = 6.6\%$. This suggests that the dimension has no substantial impact on risk levels, underscoring the need to promote health education and community engagement—particularly among vulnerable populations—to foster active participation and ensure adequate information is available in cases of chronic illness.

Implications for Public Policy

The findings of this study demonstrate that the technical and social determinant dimensions of public health policies have a significant impact on controlling risk factors in patients with type 2 diabetes. Therefore, it is recommended that health authorities strengthen the continuous training of healthcare professionals in strategies for the prevention and comprehensive management of the disease, with a focus on primary care and the monitoring of key clinical indicators. Likewise, it is essential to incorporate social determinants of health transversally into prevention programs, fostering intersectoral coordination with sectors such as education, labor, and social development. The creation of effective mechanisms for community participation will enable interventions to be adapted to local realities, ensuring that policies are not only well designed but also translated into tangible improvements in patients' quality of life. Finally, it is suggested to establish permanent monitoring and evaluation systems for the implemented policies to guarantee their effectiveness, sustainability, and responsiveness to changing epidemiological conditions.

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