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Multicriteria evaluation of cancer prevention pathways integrating MICMAC structural analysis and Régnier Abacus.

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ABSTRACT

Introduction: Cancer prevention requires comprehensive approaches that consider the complexity of the social, institutional, and behavioral factors involved. This study aimed to evaluate cancer prevention pathways using a multicriteria approach, integrating the MICMAC structural analysis method and Régnier Abacus, in order to identify the most relevant and feasible strategies for strengthening public health policy.

Methods: A mixed, descriptive, prospective, and participatory study was developed, structured in four phases: (1) a literature review for the identification of variables; (2) validation and prioritization of variables with 12 experts in public health and prospective studies; (3) application of the MICMAC method for the analysis of influence and dependence between variables, complemented with the Régnier Abacus for the evaluation of desirability and feasibility of the strategies; and (4) validation of the model and reliability analysis.

Results: The structural model identified five driving variables: health education, community participation, sustainable public financing, intersectoral coordination, and institutional governance, as determining factors of the preventive system. Régnier Abacus ranked five main strategies: Strategies R1 (Community Health Education and Communication) and R4 (Strengthening Primary Health Care) obtained the highest scores for desirability and feasibility, establishing themselves as priority actions for immediate implementation. Expert consensus exceeded 80%, confirming the coherence between the structural analysis and the multi-criteria prioritization.

Conclusion: The MICMAC–Régnier approach enabled the development of a comprehensive, participatory, and validated model that guides strategic planning for cancer prevention. The findings highlight the importance of strengthening health education, primary care, and governance as cornerstones of sustainable intervention, and demonstrate the usefulness of multicriteria analysis for public health decision-making. The model is replicable in other contexts and at different levels of health policy

Keywords: Multicriteria evaluation; consensus; public health policies; health governance; health education.

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1. INTRODUCTION

Cancer is one of the leading causes of mortality and morbidity worldwide, posing an increasing challenge to public health systems (HS). The World Health Organization (WHO, 2022) estimates that one in five people will develop some form of cancer during their lifetime, and that more than 30% of these cases could be prevented through effective interventions focused on reducing risk factors, health education, and early detection. However, the structural complexity of social, economic, and environmental determinants makes it difficult to implement comprehensive and sustainable prevention policies (Alcaraz et al., 2020; Trapani et al., 2022), necessitating the incorporation of systemic and prospective approaches that integrate the multiple dimensions of analysis..

In recent years, the literature on health policy management has demonstrated the effectiveness of multi-criteria evaluation tools in managing health policies (Mühlbacher & Kaczynski, 2016; Marsh et al., 2014). These methodologies allow for the comparison of intervention alternatives based on both qualitative and quantitative criteria, overcoming the limitations of unidimensional approaches (Frazão et al., 2018). In particular, the multicriteria approach is frequently used to seek consensus among actors with diverse interests, while simultaneously offering a balance between technical evidence and social perception

Among the prospective methodologies applied to the analysis of complex systems in the health sector, the MICMAC structural analysis (Cross-Impact Matrix – Multiplication Applied to a Classification) developed by Michel Godet (Godet & Durance, 2011) stands out. This analysis involves identifying and classifying the variables that contribute to a system's dynamics based on their degree of influence and dependence. When applied to HS, this methodology has proven to be effective in prioritizing key determinants and constructing future health policy scenarios (Emami et al., 2022). By identifying variables with high influence and low dependence, the MICMAC structural analysis helps describe the system's structural relations.

On the other hand, Régnier Abacus, a qualitative multicriteria analysis method based on generating expert consensus, which began in the late 1990s and was proposed by Philippe Régnier, can be understood as a tool for analyzing the desirability (impact and social acceptance) and feasibility (technical, economic, and institutional feasibility) of different courses of action. This tool has been used in various research fields to prioritize and rank variables or strategies and to evaluate policies in uncertain contexts.

Therefore, the use of MICMAC and Régnier Abacus would represent a significant methodological shift in the field of cancer prevention, enabling the integration of structural system analysis and participatory multicriteria evaluation of preventive strategies. This will allow for the identification of the variables that structure prevention policies while simultaneously prioritizing courses of action based on their potential impact and feasibility within the given context. Although some previous studies have employed similar hybrid approaches in areas such as healthcare planning and risk management (Vásquez et al., 2023; Robles et al., 2016), their application to the evaluation of cancer policies remains uncommon, thus presenting an opportunity for scientific innovation.

In this context, this study presents a hybrid model of multicriteria evaluation, based on the integration of the MICMAC structural analysis and Régnier Abacus, with the aim of evaluating and prioritizing cancer prevention pathways. The intention is to offer a methodological tool that supports strategic decision-making (DM) in HS, facilitating the identification of key structural variables and the development of prospective intervention scenarios. The central purpose is to generate an analytical framework that contributes to the design of more coherent, participatory, and sustainable preventive policies, capable of anticipating emerging challenges in the fight against cancer.

2. METHODOLOGY

This research was conducted using a mixed approach that was descriptive, prospective, and participatory. A mixed approach was chosen because it combines quantitative and qualitative techniques (Angouri & Litoselliti, 2018), allowing for the integration of the analytical rigor of the MICMAC method, which is based on the structural analysis of relations between variables, with the subjective and consensual evaluation of Régnier Abacus. This methodological combination allows for addressing complex phenomena in HS, where technical factors must be analyzed alongside social perceptions and criteria (Creswell & Clark, 2017).

The descriptive nature of the study stems from its aim to identify, classify, and analyze the structural variables that influence cancer prevention, without experimental intervention, limiting itself to characterizing their dynamics within the health system (Siedlecki, 2020). Its prospective orientation lies in the fact that it not only analyzes the current situation but also projects future action scenarios by identifying driving and dependent variables, using the MICMAC method as a tool for analyzing interdependencies and constructing possible scenarios (Godet & Durance, 2011).

The participatory approach incorporates expert opinion and an interdisciplinary perspective into DM. By implementing the Delphi technique and Régnier Abacus, the aim is to reach a consensus on prioritizing proposed preventive strategies, thereby strengthening the model, its applicability, and its relevance.

The methodological approach was sequentially structured in four phases. Phase 1 consisted of a systematic literature review using scientific databases such as Scopus, PubMed, and Web of Science, covering the period 2010–2023. This phase aimed to identify the structural factors that affect the effectiveness of cancer prevention strategies. Based on this initial review, a list of twenty-five potential variables was compiled and subsequently submitted to a panel of experts using the Delphi technique.

The group consisted of twelve professionals with experience in clinical oncology, epidemiology, health planning, and public policy. Each expert evaluated the relevance and influence of the proposed variables, which allowed for refining the initial list and reaching a consensus on twelve critical variables, achieving a Kendall's coefficient of concordance greater than 0.75, demonstrating a high level of agreement among the participants.

In the second phase, the MICMAC method was applied. A twelve-by-twelve direct impact matrix was constructed, in which experts assessed the intensity of each variable's influence on the others using a four-level ordinal scale: 0 for no influence, 1 for weak influence, 2 for moderate influence, and 3 for strong influence. Subsequently, the matrix was processed using the MICMAC software (LIPSOR–EPITA, Paris), resulting in an influence and dependency map that allowed the variables to be classified into four categories: driving, dependent, link, and autonomous.

The driving variables were identified as elements of high influence and low dependence, while the dependent variables were recognized as results of the system's behavior. This structural analysis served as the basis for the design of prospective scenarios.

In the third phase, Régnier Abacus was used to prioritize strategies or scenarios through a collective evaluation of their desirability and feasibility. Based on the results of the MICMAC, representative preventive pathways were defined. Each expert assigned scores to the pathways on a scale ranging from 1 (very unfavorable) to 5 (very favorable), considering both social desirability and technical and institutional feasibility, and the scores were color-coded (Table 1). The results were then systematized through agreement and strategic prioritization.

Table 1. Régnier Abacus Scale

Red	1	Very unfavorable
Orange	2	Unfavorable
Yellow	3	Neutral
Light green	4	Favorable
Dark Green	5	Very Favorable

Source: Prepared by the authors

This method of graphic representation allows for generating consensus and prioritizing factors, as evidenced in the qualitative research work of Riemens et al. (2021) and Diez and López (2011).

Finally, the fourth phase consisted of validating the model through a second Delphi round with the same group of experts, with the purpose of confirming the consistency between the results obtained in the structural analysis and the multicriteria prioritization. The internal consistency of the model was evaluated using Cronbach's alpha coefficient, and the level of consensus was verified to ensure the stability of the conclusions. All procedures adhered to the ethical principles of research involving human subjects. Written informed consent was obtained from each participant, guaranteeing the confidentiality and anonymity of the opinions expressed. No phase of the study involved the use of patient clinical data or direct medical interventions.

The result of this methodological process was the development of a hybrid multicriteria evaluation model capable of identifying the structural variables of the cancer prevention system, establishing hierarchies among the most effective intervention pathways, and generating prospective scenarios to guide the DM in the context of HS policies. Thus, the combination of MICMAC and Régnier Abacus offers a systemic, participatory, and prospective perspective that aims to strengthen strategic planning in cancer prevention.

3. RESULTS

The literature review identified a set of structural variables that comprise the cancer prevention system. The structural variables presented in this section are key factors in the planning, implementation, and evaluation of HS prevention strategies and were classified according to their theoretical relevance, frequency of appearance in the literature, and alignment with the multicriteria approach. Table 1 summarizes the initial twenty-five variables, along with a brief conceptual description and their corresponding bibliographic references, which served as the basis for the structural analysis using the MICMAC method and the subsequent prioritization using Régnier Abacus.

Table 1. Initial variables of the cancer prevention system

#	Variable	Description	Bibliographic reference
1	Health education	Level of knowledge and skills of the population regarding cancer prevention.	Majcherek et al. (2021)
2	Community participation	Active community involvement in prevention programs.	Franchini et al. (2022)

3	Sustainable public funding	Allocation of stable resources for prevention programs.	Beaglehole et al. (2011)
4	Intersectoral articulation	Coordination between sectors (health, education, environment).	Kothari et al. (2013)
5	Primary care coverage	Universal access to basic preventive health services.	(de Vries, Buitrago, Quitian, Wiesner, & Castillo, 2018)
6	Availability of diagnostic technologies	Access to screening and early diagnosis equipment.	Valentini et al. (2022).
7	Training of healthcare personnel	Level of training in prevention and early detection.	Wangen et al. (2023)
8	Regulatory framework	Existence of legal frameworks that support cancer prevention.	Moreira, et al. (2019)
9	Technological innovation	Incorporation of new technologies for prevention.	(Hesse et al., 2021)
10	Equity in access	Reduction of socioeconomic gaps in preventive services.	Adsul et al. (2022)
11	Healthy lifestyles	Adoption of protective habits (diet, exercise).	Spring et al. (2015)
12	Tobacco control	Implementation of effective anti-tobacco policies.	WHO (2023)
13	Alcohol control	Strategies to reduce alcohol consumption associated with cancer.	Rehm & Imtiaz (2016)
14	HPV vaccination	Coverage and effectiveness of the vaccination program.	Athanasiou et al. (2020)
15	Population screening	Implementation of systematic early detection programs.	Mandal & Basu (2018)
16	Hospital infrastructure	Physical capacity for preventive care and follow-up.	Ntekim, et al. (2020)
17	Institutional governance	Management and leadership capacity in HS.	Kickbusch & Gleicher (2021)
18	Interinstitutional communication	Information flow between levels of government.	Brownson et al. (2011)
19	Epidemiological research and monitoring	Production of evidence on incidence and risk.	Toporcov & Wünsch (2018)
20	Risk perception	Level of individual awareness of cancer risk.	Riddel & Hales (2018)
21	Adherence to programs	Population compliance with preventive campaigns.	Kabat et al. (2015)
22	Geographical accessibility	Availability of preventive services in various locations.	Rauch et al. (2023)
23	Political support	Commitment of authorities to preventive policies.	Brawley (2017)
24	International cooperation	Participation in global cancer prevention networks.	Beaglehole et al. (2011)

25	Monitoring and evaluation	Existence of indicators to measure preventive impact.	Tulchinsky & Varavikova (2014)

Source: Prepared by the authors based on the literature (2010-2023)

From the initial set of twenty-five variables identified in the literature review, a validation and prioritization process was applied with the participation of experts in HS, epidemiology, and prospective planning. This exercise, carried out using the Delphi technique, allowed for the refinement of the most representative variables of the cancer prevention system. The panel's consensus determined the selection of twelve critical variables, considered fundamental for the MICMAC structural analysis and the subsequent multicriteria evaluation using the Régnier Abacus. Table 2 presents these variables along with their coded designations, from V1 to V12, for interpretation within the study and to justify their relevance.

Table 2. Selected critical variables for the MICMAC–Régnier model

Code	Variable	Justification of relevance
V1	Health education	It is the main driving variable; it influences the adoption of healthy lifestyles and adherence to preventive programs.
V2	Community participation	It promotes the sustainability of policies and strengthens local governance.
V3	Sustainable public funding	It is a structural determinant that conditions the feasibility of all other actions.
V4	Intersectoral articulation	It increases the effectiveness of the preventative system through institutional synergies.
V5	Primary care coverage	Key variable for equity and timely cancer detection.
V6	Training of healthcare personnel	It increases the technical quality and effectiveness of interventions.
V7	HPV vaccination	Priority cost-effective intervention in the prevention of cervical cancer.
V8	Population screening	It improves survival through early diagnosis.
V9	Healthy lifestyles	Variable with direct impact on cancer incidence.
V10	Institutional governance	It has a cross-cutting influence on policy planning, regulation, and control.
V11	Regulatory framework	It defines the institutional limits and the mandatory nature of the interventions.
V12	Monitoring and evaluation	It allows for feedback on public policy with empirical evidence.

Source: Prepared by the authors based on the literature (2010-2023) and expert consultation

MICMAC analysis results

The structural analysis of the cancer prevention system was developed using the MICMAC method to identify the relations of influence and dependence among the selected variables. This approach allowed the system's structure to be represented in terms of its internal dynamics, determining which factors play a driving, linking, dependent, or autonomous role within the conceptual model.

First, the matrix of direct influence/dependence was constructed (Figure 1). The results of this matrix reveal a structural pattern consistent with the systemic nature of the analyzed phenomenon, highlighting the variables related to health education, community participation, sustainable public financing, intersectoral coordination, and institutional governance as the most influential (the highest numbers of 2 and 3 in their rows). In turn, the variables linked to HPV vaccination, population screening, and healthy lifestyles showed high dependence (the highest numbers of 2 and 3 in their columns), reflecting their status as outcomes of the preventive system.

Figure 1. Matrix of direct influence/dependence

	1 : V1	2 : V2	3 : V3	4 : V4	5 : V5	6 : V6	7 : V7	8 : V8	9 : V9	10 : V10	11 : V11	12 : V12
1 : V1	0	3	2	2	2	3	2	2	2	2	2	2
2 : V2	3	0	2	3	3	2	2	3	3	2	3	2
3 : V3	2	2	0	2	3	2	2	3	3	3	3	2
4 : V4	2	2	2	0	2	3	2	2	2	2	3	2
5 : V5	1	3	3	1	0	2	3	3	3	1	1	3
6 : V6	3	1	1	3	3	0	2	2	2	3	1	2
7 : V7	0	0	1	1	2	2	0	1	1	1	1	0
8 : V8	1	1	0	1	0	1	3	0	0	0	0	0
9 : V9	2	0	1	0	2	1	1	1	0	0	0	0
10 : V10	2	3	2	2	2	3	2	3	3	0	3	2
11 : V11	1	0	0	0	2	1	3	0	1	1	0	1
12 : V12	1	1	0	1	1	0	1	1	1	0	1	0

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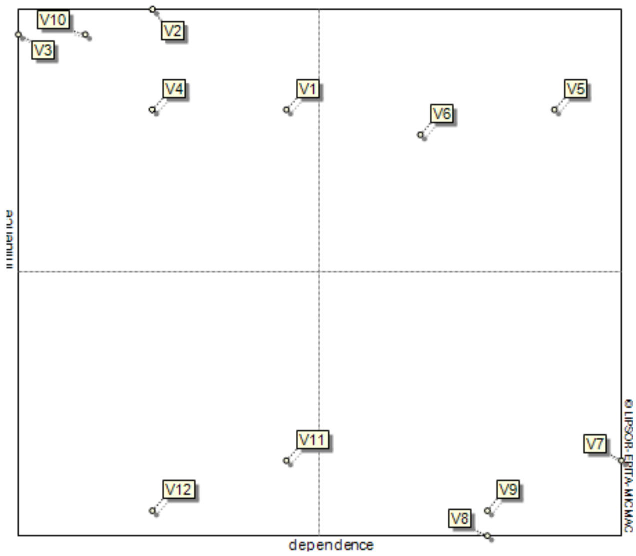
Source: Prepared by the author based on expert consultation

This step of MICMAC allowed for estimating the degree of cohesion and interrelation of the system, serving as a basis for the subsequent graphical representation of the MICMAC structural map, which facilitates the visualization of the levels of influence and dependence of each variable within the model.

The graphical representation of the map of direct influence/dependence (Figure 2) allows visualization of the structural position of critical variables within the cancer prevention system. In the upper left quadrant are the driving variables (V1, V2, V3, V4, and V10), which exhibit high influence and low dependence, acting as the main drivers of the system. In the upper right quadrant are the linking variables (V5 and V6), characterized by exerting and receiving multiple influences, making them elements of regulation and transmission between strategic factors and operational results.

In the lower right quadrant, the dependent variables (V7, V8, and V9) are grouped, reflecting the effects of the system's overall functioning and representing the observable results of preventive actions. Finally, in the lower left quadrant, the autonomous variables (V11 and V12) appear, exhibiting low influence and dependence. These variables maintain a marginal role in the systemic dynamics, although they contribute to the normative and evaluative stability of the model. This pattern confirms the system's internal coherence and the appropriate differentiation between driving, intermediary, and results factors.

Figure 2. Map of direct influence/dependence



Source: Prepared by the author based on expert consultation

On the other hand, the map of indirect influence/dependence shows, through second and third order relations, the systemic dynamics by considering the propagated effects between variables. Unlike the direct map, this analysis reveals the capacity of the variables to influence the overall structure of the system in a mediated way, allowing the identification of the factors with the greatest diffusion or resonance within the cancer prevention model. In this case, all variables maintained their position, which demonstrates the robustness of the model.

Results of the Régnier Abacus

Once the variables were identified and structurally classified using the MICMAC method, the Régnier Abacus technique was applied to evaluate the social desirability and the technical and institutional feasibility of five cancer prevention pathways derived from the structural analysis described in Table 3.

Table 3. Preventive strategies evaluated in the Régnier Abacus

Code	**Preventive pathway or Strategy**	**Brief description**
R1	Education and community communication in health	Promotion of knowledge, attitudes, and healthy behaviors in the population, aimed at reducing risk factors and facilitating early cancer detection.
R2	Control of tobacco and alcohol consumption	Strengthening of public policies, regulations, and awareness campaigns to reduce the consumption of carcinogenic substances.
R3	Vaccination and control of oncoviral infections (HPV and Hepatitis B)	Implementation and maintenance of immunization programs against viral agents associated with cancer.
R4	Strengthening of primary health care	Expansion of the coverage and improvement of the problem-solving capacity of the first level of care, with a territorial and preventive approach.
R5	Population screening and early diagnosis	Consolidation of systematic early detection programs (breast, cervical, and colon cancer), with equitable coverage and quality standards.

Source: Prepared by the author based on structural analysis and expert consultation

Each of the twelve participating experts assigned scores to each pathway, considering two dimensions: a) Desirability, which reflects social relevance and potential impact on HS; and b) Feasibility, which expresses the technical, economic, and institutional viability of its implementation.

Analysis of the responses in Table 4 reveals a marked trend toward favorable and very favorable (dark green and light green), demonstrating the average consensus among experts regarding the dimensions of desirability and feasibility. However, areas of disagreement were also identified, indicated by the yellow, orange, and even red colors of some routes, showing that, although well-regarded, some strategies have low political or economic feasibility.

Table 4. Régnier Abacus results by expert

	Ex 1	**Ex 2**	**Ex 3**	**Ex 4**	**Ex 5**	**Ex 6**	**Ex 7**	**Ex 8**	**Ex 9**	**Ex10**	**Ex11**	**Ex12**
R1												
R2												
R3												
R4												
R5												

Source: Prepared by the author based on structural analysis and expert consultation

On the other hand, representing the results by consensus allows for a clearer understanding of the degree of homogeneity in the assessments of the 12 experts consulted. Table 5 shows a clear prioritization of educational and community-based strategies (R1 and R4), which were evaluated as highly desirable and feasible, placing them in the first row. These strategies combine a high population impact with viable institutional implementation, making them pillars of the cancer prevention model.

Strategies R3 (vaccination) and R5 (screening), although highly desirable, face logistical and budgetary limitations, placing them below R1. Finally, strategy R2 (tobacco and alcohol control), despite its relevance in HS, was perceived as having low political and economic feasibility, as it depends on complex regulations and structural resistance.

Table 5. Results ordered by consensus

R1												
R4												
R3												
R5												
R2												

Source: Prepared by the author based on structural analysis and expert consultation

The application of Régnier Abacus made it possible to build a hierarchy of preventive strategies based on multicriteria and expert consensus, highlighting the importance of integrating education, primary care, and social participation as central axes of cancer prevention policies.

Model validation and consistency of results

To verify the coherence and stability of the proposed model, a second Delphi round was conducted with the same panel of experts who participated in the previous phases. This stage validated the correspondence between the results of the structural analysis (MICMAC) and the multicriteria prioritization derived from Régnier Abacus, confirming the internal robustness of the system of variables and strategies.

The experts agreed on more than 80% of the judgments issued, demonstrating a high level of consensus regarding the final ranking of preventive strategies. The internal consistency of the model, calculated using Cronbach's alpha coefficient, yielded a value of α=0.87, indicating a high reliability score in the joint evaluation. These data demonstrate the validity of the methodological approach and the validity of the MICMAC-Régnier model, reinforcing the fact that the conclusions obtained are the result of a stable expert consensus in the construction of a clearly defined conceptual framework. Data analysis was performed using MICMAC version 6.0 for structural analysis, Microsoft Excel was used to graphically represent the results of the Régnier Abacus, and SPSS 26 was used for the corresponding statistical analysis of reliability.

The results observed throughout the four methodological phases demonstrate the internal consistency and applied relevance of the proposed model, as well as its system of variables and strategies. These elements allow for an understanding of the structure of cancer prevention while highlighting the most potentially impactful and institutionally viable courses of action. The high estimated reliability and the consensus reached by these experts corroborate the validity of the MICMAC–Régnier model, which can be a valuable support tool for strategic DM in the area of HS.

4. DISCUSSIONS

The results of this study allow for understanding how the system supporting cancer prevention strategies is structured, while also establishing its hierarchy based on the criteria of influence, dependence, desirability, and feasibility. The MICMAC structural analysis revealed that the variables with the greatest driving force constitute the driving axes of the cancer prevention system. These variables have a structuring capacity over the others, generating synergies that reinforce the implementation of integrated policies. This finding aligns with the arguments of Zonderman et al. (2014) and Colditz and Wei (2012), who maintain that the sustainability of cancer prevention programs depends on the interaction between social, institutional, and economic factors.

The classification obtained from the MICMAC structural analysis also highlighted the importance of linking variables, which act as transmission nodes between structural factors and system outcomes. The existence of dependent variables reinforced the role of these actions as visible results of the health system's functionality, rather than as direct causes. In contrast, autonomous variables (regulation and monitoring) function as stabilizing factors, providing coherence and institutional sustainability to the model. This structure aligns with those observed in similar structural analysis studies applied to HS policies (Gardas et al., 2022).

The analysis using Régnier Abacus complemented the structural perspective by incorporating desirability and feasibility considerations, reflecting expert perceptions of how preventive pathways could be implemented in the real-world context of interventions. Strategies R1 (education and community communication) and R4 (strengthening primary care), which were rated as the best and most feasible, also demonstrate high effectiveness, as they can be adapted to the diverse characteristics of different institutions. These results are consistent with the evidence shown by Airhihenbuwa et al (2021), and Manchanda and Gaba (2018), who consider health education, primary care, and the population approach as the fundamental basis for effective prevention of chronic diseases and even cancer.

On the other hand, strategies R3 (vaccination and control of oncoviral infections) and R5 (population screening) received support as highly desirable and feasible, suggesting the need for significant financial investment and infrastructure to implement screening and vaccination programs, which is something desirable in middle-income countries. Meanwhile, strategy R2 (control of tobacco and alcohol consumption) showed a considerable gap between social acceptance and political feasibility, a finding consistent with studies documenting the clear resistance of certain economic sectors to stricter regulations (Brugha & Varvasovszky, 2000).

The validation of the model through the second Delphi round and the calculation of Cronbach's alpha coefficient ($\alpha = 0.87$) confirmed the internal consistency and stability of the results, supporting the reliability of the MICMAC–Régnier model as a methodological tool for designing evidence-based and consensus-driven prevention policies. This combined approach, which integrates structural analysis and multicriteria evaluation, provides a comprehensive view of the complexity of the cancer prevention system, enabling the prioritization of high-impact actions and guiding the efficient allocation of resources.

Finally, the findings suggest that cancer prevention requires an intersectoral, participatory, and sustained approach, where health education, primary care, and governance are the strategic pillars. The proposed model constitutes a methodological contribution that can be replicated in other HS contexts to strengthen strategic planning and evidence-based DM.

5. CONCLUSIONS

The MICMAC–Régnier model demonstrated its analytical and participatory nature; therefore, it can be stated that it was capable of understanding the structure and dynamics of the cancer prevention system through its application. The MICMAC–Régnier model linked the technical perspective with the consensus of the expert group and revealed causal relations that are not apparent in unidimensional approaches. Health education, community participation, and institutional governance emerged as structural factors driving the sustainability of the prevention system. Their effect is transversal to interventions and confirms that the most effective interventions are not necessarily those that entail the highest cost, but those that activate social and organizational capacities.

Primary health care and the training of health professionals represent the point of convergence between strategy and operationalization, demonstrating that strengthening the first levels of care can be considered a fundamental requirement for translating prevention policies into tangible and sustainable results. Vaccination, screening, and risk factor control strategies are technically effective, although they are vulnerable to funding, logistical, and governance limitations. This highlights the need for sustained investment policies and intersectoral coordination that transcend political cycles.

The results of this research suggest that public policies for cancer prevention should be oriented towards integrated, participatory, and sustainable models where health education, primary care, and institutional governance act as strategic pillars. The evidence obtained in this article demonstrates that the DM based on multicriteria analysis and expert consensus allows for prioritizing actions with significant social impact and real feasibility, thereby improving resource utilization and interinstitutional coordination.

Similarly, the MICMAC–Régnier approach can also be considered a replicable framework for other HS topics to help identify key variables and prioritize preventive strategies in other contexts. Future research could delve deeper into the longitudinal evaluation of prioritized pathways and the inclusion of quantitative indicators of population impact, in order to establish an equitable, resilient, and adaptive cancer prevention system.

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