ORIGINAL ARTICLE


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# Analysis of clinical scientific research on gestational diabetes in Chile, 2010–2025

## Análisis de la investigación clínica científica sobre diabetes gestacional en Chile, 2010 – 2025


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**ABSTRACT**

Introduction: Gestational diabetes mellitus (GDM) is a growing public health concern in Chile, strongly associated with obesity and other modifiable factors. Monitoring national scientific production helps identify research gaps and priorities. Objectives: To describe Chilean scientific output on GDM over the last 15 years, including study designs, thematic areas, indexation, and citation patterns. Methods: A descriptive bibliometric study based on a systematic review of articles on GDM in Chile published from January 2010 to June 2025. Searches were conducted in PubMed, Cochrane, EBSCO, Web of Science, Embase, and Scopus, complemented with manual searching. Study selection followed PRISMA guidelines. Variables included design, thematic category, indexation, journal quartile, and citations. Data were analyzed descriptively. Results: A total of 89 studies were included. Of these, 48% were observational, 19% experimental, and 33% systematic reviews. Regarding indexation, 74% were published in Web of Science, 20% in Scopus, and 6% in SciELO; 20% corresponded to Q1 journals. Main topics were pathophysiology (n=27), risk factors (n=22), and maternal–fetal complications (n=17). Preventive areas were minimally represented, including exercise (n=3) and nutrition (n=2). Scientific production increased notably from 2018, peaking in 2021, with fluctuating output thereafter. Conclusions: Chilean scientific production on GDM has expanded in volume and journal impact; however, research remains concentrated in biomedical areas. Significant gaps persist in prevention, lifestyle interventions, and updated epidemiological data. Strengthening research agendas focused on modifiable determinants and public health strategies is essential to address the burden of GDM in Chile.



Keywords: Gestational diabetes; obesity; scientific research; systematic review; maternal health.



**RESUMEN**

Introducción: La diabetes mellitus gestacional (DMG) es un problema creciente en Chile, asociado a obesidad y otros factores modificables. Analizar la producción científica nacional permite identificar brechas y orientar prioridades. Objetivos: Describir la producción científica chilena sobre DMG en los últimos 15 años, considerando diseños, temáticas, indexación y citaciones. Métodos: Estudio bibliométrico descriptivo basado en una revisión sistemática de artículos sobre DMG en Chile publicados entre enero de 2010 y junio de 2025. Se realizaron búsquedas en PubMed, Cochrane, EBSCO, Web of Science, Embase y Scopus, complementadas con búsqueda manual. La selección siguió PRISMA. Se analizaron diseño, temática, indexación, cuartil y citaciones mediante estadística descriptiva. Resultados: Se incluyeron 89 estudios: 48% observacionales, 19% experimentales y 33% revisiones sistemáticas. El 74% fue publicado en Web of Science, 20% en Scopus y 6% en SciELO; 20% correspondió a revistas Q1. Las temáticas predominantes fueron etiopatogenia (n=27), factores de riesgo (n=22) y complicaciones materno–fetales (n=17). Las líneas preventivas fueron escasas, destacando ejercicio (n=3) y nutrición (n=2). La producción aumentó desde 2018, alcanzando su máximo en 2021 y mostrando variabilidad posterior. Conclusiones: La producción científica chilena sobre DMG ha crecido en volumen y visibilidad, pero continúa centrada en áreas biomédicas. Persisten vacíos importantes en prevención, estilos de vida y datos epidemiológicos actualizados. Priorizar investigaciones orientadas a determinantes modificables y estrategias poblacionales es clave para enfrentar la alta prevalencia de DMG en Chile.



Palabras claves: Diabetes gestacional; obesidad; investigación científica; revisión sistemática; salud materna.

## Introduction

Obesity is a disease characterized by excessive adipose tissue accumulation and is defined by a body mass index (BMI) of 30 or higher. In Chile, 38.4% of women over the age of 15 are obese and 36.4% are overweight, indicating that approximately 75% of Chilean women have excess body weight[1].

Obesity has been identified as a major risk factor for developing gestational diabetes mellitus (GDM)[2], and pre-pregnancy body mass index shows a stronger association with its onset than weight gain during pregnancy[3,4]. GDM is one of the most common metabolic disorders of pregnancy and is associated with both short- and long-term maternal and fetal complications[1,2].

The incidence of GDM has increased steadily in Chile and worldwide, posing a significant risk to maternal-fetal health[5]. This increase, along with the clinical impact of GDM, has generated growing interest in identifying risk factors such as BMI, adiposity, dietary habits, and physical activity[6]. Early detection and timely treatment can reduce associated chronic complications [7]. However, the national prevalence remains difficult to estimate due to diagnostic variability; in Chile, a prevalence of approximately 9.5% is reported[8,9].

Given the epidemiological and clinical significance of GDM, there is no systematic, up-to-date overview of national scientific output over the past 15 years. This limits our understanding of the actual contribution of Chilean research to the management of the disease, hinders the identification of knowledge gaps, and restricts the alignment between clinical needs and the generation of evidence. Having a comprehensive overview of the volume, topics, quality, and evolution of research is essential for guiding decisions regarding public policy, funding, research priorities, and academic training.

Therefore, the objective of this study is to characterize Chilean scientific output on GDM over the past 15 years and to assess its alignment with the magnitude of the problem in the country.

## Methods

### Study design

A descriptive bibliometric study was conducted, based on a systematic review of the scientific literature on gestational diabetes mellitus (GDM) in Chile. The study adhered to the STROBE guidelines for descriptive observational studies and was structured in accordance with the PRISMA 2020 statement for systematic reviews.

### Information sources and search strategy

The search was conducted between January 2010 and June 2025 in the following databases: PubMed, Cochrane Library, EBSCO, Web of Science (WoS), Embase, and Scopus. It was supplemented by a secondary manual search to identify additional references not captured by the primary searches.

MeSH terms and keywords related to GDM and the Chilean population were used, including: ("gestational diabetes" OR "gestational diabetes mellitus") AND ("Chile" OR "Chilean population").

The entire process of managing, reviewing, and selecting articles was conducted using the COVIDENCE® platform.

### Inclusion and exclusion criteria

Inclusion criteria

- Studies conducted partially or entirely on Chilean women with GDM or in health centers located in Chile.
- Research designs: observational studies, experimental studies (randomized or non-randomized), case series, pilot studies, systematic reviews, and meta-analyses.
- Articles published in journals indexed in Web of Science (WoS), Scopus, or SciELO.
- Basic science studies conducted at national research centers.
- Multicenter studies with at least one author affiliated with a Chilean institution.

Exclusion criteria

- Letters to the editor, commentaries, abstracts, or conference posters.
- Clinical trials conducted by the pharmaceutical industry at any stage.
- Studies not related to GDM, the Chilean population, or the national context.

## Selection process and flowchart

Two researchers independently assessed the titles and abstracts. Potentially eligible articles were reviewed in full text. Discrepancies were resolved by consensus.

The process of identification, screening, eligibility, and inclusion is presented using a PRISMA flowchart (Figure 1). A total of 159 initial records were identified, of which 89 studies were ultimately included.

Variables and bibliometric indicators

The variables analyzed included:

Study characteristics

- Study design type (observational, experimental, systematic review).

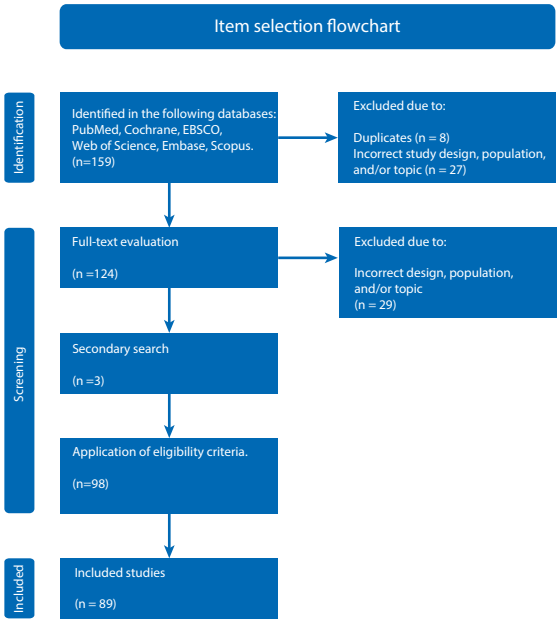


Figure 1. Flowchart PRISMA[33] for selecting articles on gestational diabetes in Chile.

- Year of publication.
- Institution and affiliation of Chilean authors.
- Type of population or sample.

Bibliometric indicators

- Database and publication index (WoS, Scopus, SciELO).
- Journal quartile (Q1–Q4 according to Scimago Journal Rank).
- Number of cumulative citations (Google Scholar, Scimago, Clarivate).
- Main topic of the study (etiopathogenesis, risk factors, complications, prevention, exercise, nutrition, basic sciences, etc.).

Thematic variables

The articles were categorized into predefined thematic areas:

1. Etiopathogenesis and metabolism
2. Risk factors
3. Maternal-fetal complications
4. Placental and circulatory complications
5. Exercise and prevention
6. Nutrition
7. Dental health and other áreas

## Data analysis

The extracted data were organized and analyzed descriptively.

The following were used: The results are presented using tables, bar charts, and illustrative figures (Figures 2, 3, and 4).

- Absolute and relative frequencies to characterize the study designs.
- Temporal trends (2010–2025) based on annual publication counts.

- Distribution by indexing and quartile to assess quality and impact.
- Citation analysis to determine the visibility of the articles.
- Thematic classification to identify predominant lines of research and areas of deficiency.

## Ethical considerations

Since this study uses previously published public information, it did not involve contact with human subjects or access to personal data and therefore did not require review by an ethics committee. The principles of scientific integrity and good systematic review practices were adhered to.

## Results

Over the 15-year period analyzed, a total of 89 scientific articles on DMG in Chile were identified, indexed in the WoS and Scopus databases. The article selection flowchart is shown in Figure 1.

### Trends in scientific output by journal type and indexing (2010–2025)

Regarding indexing, 74% of the articles were published in journals included in WoS (n=66), 20% in Scopus (n=18), and 6% in SciELO (n=5). Furthermore, 20% of the publications correspond to journals classified in the Q1 quartile, indicating a high standard of scientific quality.

Longitudinal analysis shows a mixed trend in scientific publishing depending on the type of journal indexing. A general upward trend is observed in journals indexed in high-impact international databases, particularly in WoS, which show sustained growth from 2014 until reaching a peak in 2021, followed by a decline in subsequent years.

This pattern could be attributed to institutional policies incentivizing high-quality research and academic internationalization, although it may also reflect temporary saturation or editorial changes.

Publications in Scopus show a more irregular distribution, with peaks in 2018 and 2024, suggesting intermittent participation. In contrast, SciELO maintained low and sporadic publication levels, possibly due to its lower international visibility, despite its regional relevance.

International journals (WoS, Scopus, and others) show an upward trend, peaking in 2018, 2020, and 2024, which could reflect a consolidation of collaborative networks and greater interest in the international dissemination of results. On the other hand, publications in Chilean journals remained stable and at low levels, which could reflect a shift toward journals with higher impact factors. These findings suggest a transformation toward the internationalization of knowledge, a relevant aspect for future research policies. (Figure 2)

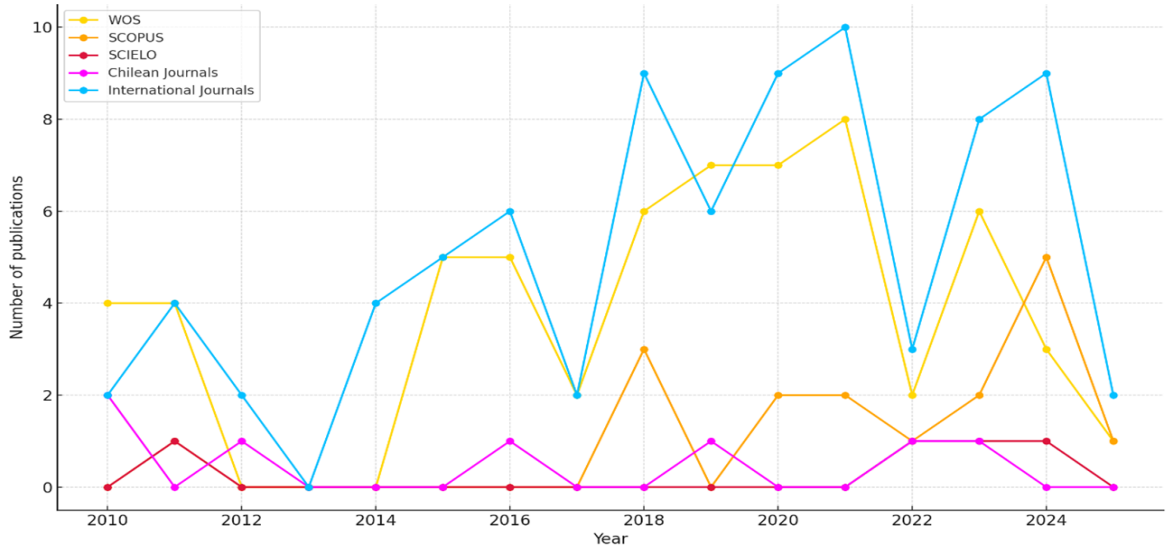


Figure 2. Trends in publications by journal type (2010–2025).

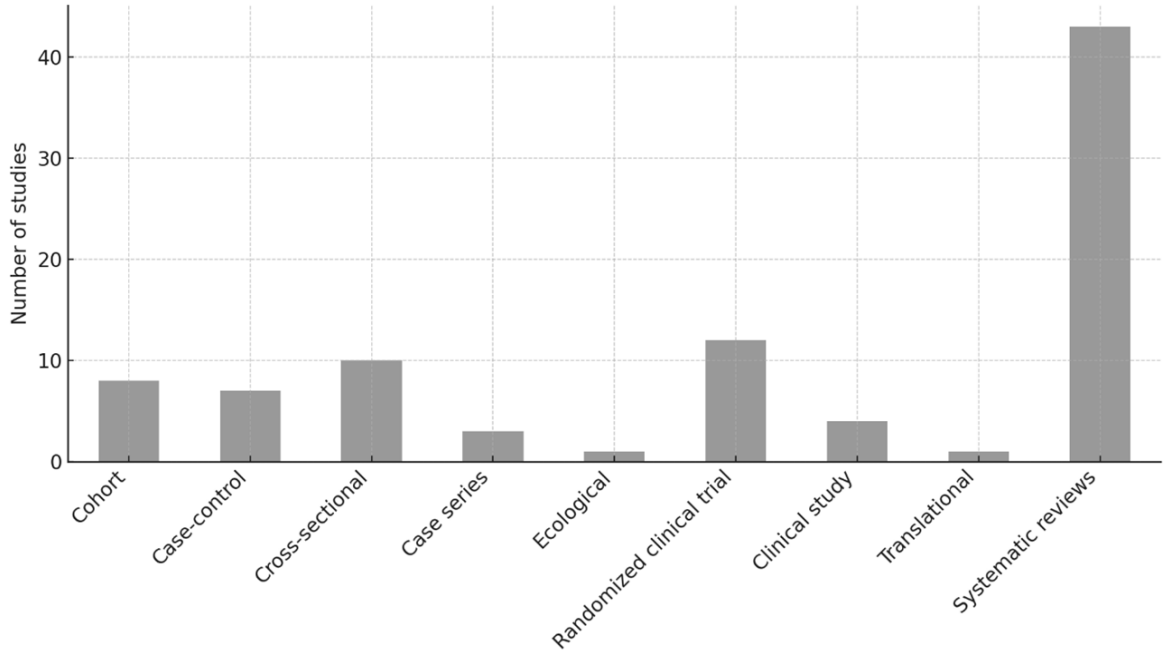


Figure 3. Study designs for gestational diabetes mellitus.

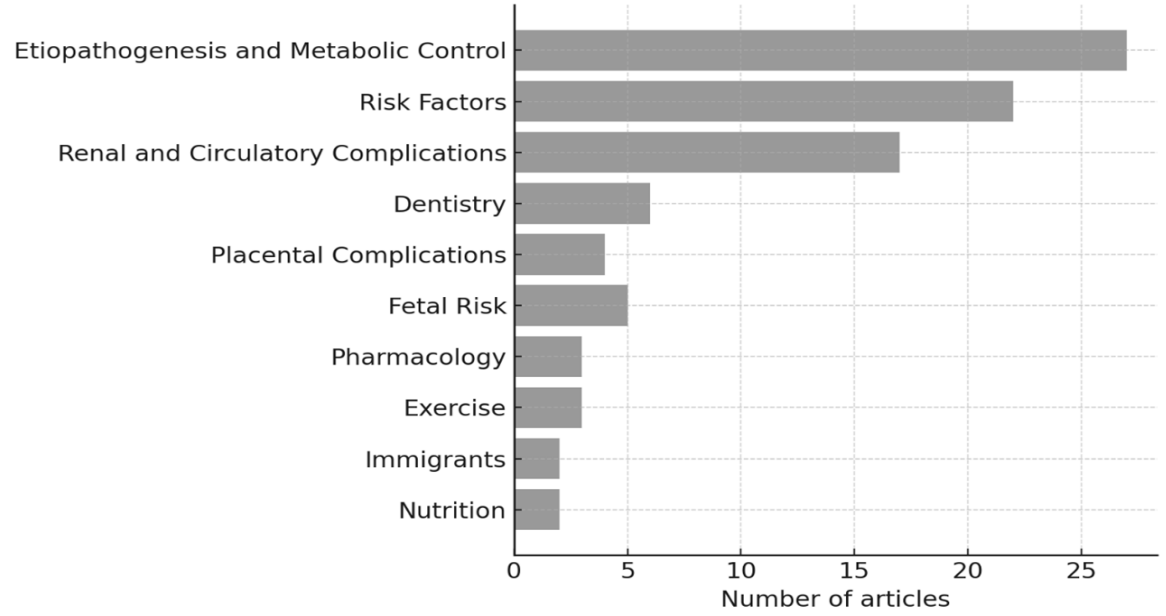


Figure 4. Number of articles by topic: gestational diabetes.

## Analysis by methodological design of the included studies

Of the 89 articles analyzed, 48% were observational studies (n=43), 19% were experimental studies (n=17), and 33% were systematic reviews (n=29).

Among the observational studies, cross-sectional designs predominated (n=10), followed by cohort studies (n=8) and case-control studies (n=7). Case series studies (n=3) and one ecological study (n=1) were also identified.

Among the experimental studies, randomized controlled trials (RCTs) stood out (n=12), followed by non-randomized clinical trials (n=4) and one quasi-experimental or community intervention study (n=1). Although the proportion of experimental studies is smaller, their presence indi-

cates a growing interest in evaluating therapeutic interventions.

### Number of citations per article

Overall, the number of citations per article was low. However, three highly cited studies stand out: Salomon C. et al. (88 citations)[10], Sanabria-Martínez G. et al. (55 citations)[11], and Westermeier F. et al. (34 citations)[12], reflecting their impact both nationally and internationally.

### Thematic analysis of the literature on gestational diabetes

Of the 89 articles, 27 focused on etiopathogenesis and metabolic control, 22 on risk factors, and 17 on circulatory and renal complications. Areas such as dentistry (n=6), placental complications (n=4), and fetal risk (n=5) showed moderate development.

The least explored topics included nutrition (n=2), exercise (n=3), pharmacology (n=3), and immigration (n=2), which represent opportunities for future research, especially in non-pharmacological strategies and social determinants.

### Scientific quality of the analyzed articles

Regarding quality, 20% of the studies were published in Q1 journals, representing a significant contribution in terms of methodological rigor and international visibility.

## Discussion

The main findings of this review indicate that, over the past 15 years, Chilean scientific output on GDM has increased steadily, with a predominance of observational studies and systematic reviews and a relative scarcity of experimental research. Additionally, most articles have been published in high-impact indexed journals, with primary research themes centered on etiopathogenesis, risk factors, and maternal–fetal complications. In contrast, studies addressing prevention, physical activity, and nutrition remain limited. This thematic distribution is consistent with reports from other countries, where GDM research has predominantly focused on biomedical aspects rather than on preventive and community-based interventions[13].

At the epidemiological and surveillance level, the available national data remain fragmented and time-lagged, making it difficult to estimate current trends and translate these data into sound public policies[14,15]. This scenario aligns with international findings highlighting persistent heterogeneity in diagnostic criteria and surveillance systems, which complicates cross-country comparisons and the estimation of the actual prevalence of GDM[16–19]. Furthermore, various studies have shown that even in high-income health systems, GDM continues to be associated with an increased risk of obstetric and perinatal complications, highlighting the need to strengthen maternal-fetal surveillance systems[20].

With regard to prevention, numerous authors have identified preconception BMI as a key determinant of the risk of GDM and its associated complications, underscoring the importance of early lifestyle interventions, appropriate management of gestational weight gain, and the promotion of regular physical activity[16–19]. This observation is consistent with international meta-analyses demonstrating that structured prenatal exercise significantly reduces the risk of GDM and improves metabolic control during pregnancy[21]. Likewise, recent systematic reviews have shown that non-pharmacological interventions—particularly those combining exercise and nutritional strategies—can reduce gestational weight gain and enhance insulin sensitivity[22]. The limited representation of these areas in the Chilean literature highlights a substantial gap between clinical needs and current research priorities.

Methodologically speaking, the predominance of observational studies allows for the description of the epidemiology and factors associated with GDM, but the low proportion of experimental studies limits the ability to establish causal relationships and rigorously evaluate preventive or therapeutic interventions. The recent increase in systematic reviews constitutes an important contribution to the synthesis of knowledge; however, it may also reflect constraints in primary research during the COVID-19 pandemic[23]. In Chile, previous studies have documented an increase in the incidence of GDM and risk factors such as advanced maternal age, high parity, and excess weight at the start of pregnancy[20]. This trend is consistent with global observations,

where maternal obesity and delayed childbearing have been identified as key factors in the sustained increase in this condition[24].

When comparing our findings with overall scientific productivity in the field of diabetes mellitus in Chile, a similar pattern becomes evident. A Chilean bibliometric study reported a substantial increase in publications between 2010 and 2020, accompanied by greater internationalization and consolidation of the field[25]. Likewise, international scientometric analyses indicate that research output in diabetes has expanded markedly in recent decades; however, persistent gaps continue to limit its effective translation into public policies and health programs[26]. In this context, our results suggest that research on gestational diabetes mellitus (GDM) follows a comparable trajectory, albeit with a lower volume of publications and a more restricted thematic scope.

Beyond the gestational period, the global literature has emphasized the high risk of progression to T2D in women with a history of GDM. Cohort studies have shown that a considerable proportion of these women develop dysglucemia in the decade following pregnancy, especially those with higher BMI or excessive gestational weight gain[27]. Likewise, recent research has proposed the use of circulating microRNAs as potential biomarkers to predict future metabolic outcomes, which could have important implications for risk stratification and long-term follow-up [28]. These results underscore the need for future lines of research in Chile to incorporate longitudinal studies and emerging biomarkers to better understand the impact of GDM on cardiometabolic health.

Our review's thematic analysis confirms that Chilean scientific output has focused on pathophysiological mechanisms and complications, while preventive, nutritional, and physical activity areas—priorities in the international literature—remain underdeveloped[11,17,18,29–32]. This discrepancy highlights the importance of aligning research agendas with the modifiable determinants of GDM, taking into account its preventable nature and intergenerational impact. Furthermore, international bibliometric studies have highlighted that interdisciplinary collaboration and co-authorship networks significantly influence the impact, visibility, and applicability of research[26], a factor that could enhance the development of research on GDM at the national level.

## Limitations of the study

Given the limited number of articles included, this review did not include a formal assessment of risk of bias, which limits the evaluation of its methodological rigor. Likewise, the exclusion of gray literature and theses may underestimate the extent of national scientific output. Finally, the delay in the publication of clinical data limits the ability to reflect the epidemiological situation of GDM in Chile in real time.

## Conclusion

Taken together, these findings indicate substantial progress in both the quantity and quality of national research on GDM; however, they also reveal critical gaps that warrant priority attention: (i) the promotion of experimental and implementation studies to advance from associative evidence toward causality and effective policy development; (ii) the consolidation of national cohorts and the strengthening of epidemiological surveillance systems; and (iii) the prioritization of research on primary and secondary prevention, with particular emphasis on lifestyle factors and social determinants of health. Should these trends persist, the development of more stable institutional support and funding mechanisms will be essential to enhance the continuity and overall quality of research in the country.

The results of this review show that national scientific output on GDM has increased in both volume and quality in recent years, although significant gaps persist in critical areas such as prevention, exercise, and nutrition. The lack of up-to-date prevalence studies limits a precise understanding of the impact of GDM in Chile and reveals a gap between the available evidence and priority clinical needs.

Gestational diabetes mellitus (GDM) is a largely preventable condition when modifiable risk factors—such as excess body weight, physical inactivity, and unhealthy dietary patterns—are effectively addressed. In this context, it is imperative that academic, clinical, and governmental institutions promote and support research fo-

cused on primary and secondary prevention, adopting an intersectoral and population-based approach.

Prioritizing research strategies centered on health determinants, as well as the promotion of healthy lifestyles, has the potential not only to reduce the incidence of GDM in the medium term but also to mitigate its maternal and fetal consequences, thereby contributing significantly to the well-being of women in Chile and to the sustainability of the healthcare system..

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