



Quality of information about liposuction for the lay public: A scoping review

Qualidade das informações sobre lipoaspiração para o público leigo: Uma revisão de escopo

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■ ABSTRACT

Introduction: This scoping review aims to analyze the quality of information about liposuction for the lay public. **Method:** A literature search was carried out from November 18 to December 12, 2021, on the following database platforms: Medline, Cochrane, LILACS, Embase, and VHL. The search strategy involved the combination of several descriptors. Three independent investigators read the abstract of studies obtained using the search strategy to evaluate those that met the eligibility criteria. **Results:** Initially, 33 articles were collected using the search strategy. Among these, 23 studies were excluded after reading the abstracts and evaluating the eligibility criteria, as they did not have outcomes of interest to the proposed topic. Thus, ten studies met the inclusion criteria, nine of which were cross-sectional and one literature review. Among the ten articles included, nine report that information about liposuction is poor and inaccurate. **Conclusion:** The content on liposuction made available to the lay public via the Internet is, for the most part, unsatisfactory.

Keywords: Lipectomy; Lipolysis; Access to information; Information dissemination; Health communication.

■ RESUMO

Introdução: Esta revisão de escopo tem por objetivo analisar a qualidade das informações sobre lipoaspiração para o público leigo. **Método:** Foi realizada busca na literatura no período de 18 de novembro a 12 de dezembro de 2021 nas seguintes plataformas de base de dados: Medline, Cochrane, LILACS, Embase e BVS. A estratégia de busca envolveu a combinação de vários descritores. Três investigadores independentes leram o resumo dos estudos que foram obtidos usando a estratégia de busca para avaliar aqueles que preenchiam os critérios de elegibilidade. **Resultados:** Inicialmente, foram levantados 33 artigos utilizando a estratégia de busca. Dentre esses, 23 estudos foram excluídos após a leitura dos resumos e avaliação dos critérios de elegibilidade, por não possuírem desfechos de interesse ao tema proposto. Assim, dez estudos preenchem os critérios de inclusão, sendo nove estudos transversais e uma revisão de literatura. Dentre os dez artigos incluídos, nove relatam que as informações sobre lipoaspiração são precárias e imprecisas. **Conclusão:** O conteúdo sobre lipoaspiração disponibilizado ao público leigo por meio da Internet é, na sua maioria, insatisfatório.

Descritores: Lipectomia; Lipólise; Acesso à informação; Disseminação de informação; Comunicação em saúde.

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INTRODUCTION

Introduced by Illouz in the early 1980s, liposuction is a surgical procedure that seeks to improve body contour by removing localized fat deposits^{1,2}.

Since the middle of the 20th century, there has been a focus by humans on physical appearance as a vehicle of identity and expression, currently even more intensified with the dissemination and popularization

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of digital social media. Therefore, there is a growing search for improvements in body contouring, including liposuction. According to data from the International Society of Aesthetic Plastic Surgery (ISAPS), in 2019, liposuction was the world's second most-performed aesthetic surgical procedure, with around 1.7 million surgeries, and the most performed in Brazil, with 231 thousand surgeries³⁻⁵.

Due to the growing understanding of the biochemical and physiological properties of the procedure, as well as biomedical technological advances, liposuction is constantly evolving, with improvements in technique, patient safety, and results. New equipment and surgeon training progressively refine the procedure, such as infiltration of solutions, advances in the design and shape of the cannula, ultrasound-assisted liposuction, vibroliposuction, Vaser-assisted liposuction, and laser-assisted liposuction^{1,6}.

Such innovations have even expanded the possibilities for improving body design, such as muscle definition liposuction. This technique, representing a highly fashionable topic among the lay public, consists of liposuction of more superficial layers of subcutaneous fat to define muscular contours in any body area, regardless of the equipment used. It is up to the plastic surgeon to fully assess the patient to recommend - or not - the use of this resource to improve the appearance of the body⁷.

Thus, over the last few decades, liposuction has evolved from a procedure that only removes small amounts of fat to a practically irreplaceable tool in the plastic surgery arsenal for improving body contouring. It has also become a useful complement in other areas of plastic surgery, such as breast reconstruction and postoperative contouring in the reconstruction of the neck and upper and lower extremities¹.

On the other hand, everyone should know that liposuction is not without risks. Some complications, such as skin irregularities, prolonged edema, ecchymosis, hyperpigmentation, changes in sensitivity, seromas, hematomas, ulcers, necrosis, visceral perforations, systemic infection, fat embolism, sepsis, and death, may occur. The estimated mortality rate from liposuction is 1 in every 5,000 procedures performed².

Currently, given the contractual model of the doctor-patient relationship, in which the patient participates in the decision-making process, most people who want to undergo liposuction actively seek information about the procedure even before the medical consultation⁸. In this case, the Internet and digital social networks offer content about plastic surgery quickly, directly, and accessible to most patients and, today, are the main search sources. However, the quality of content on the network is a cause

for concern, with some studies demonstrating precarious information. However, so far, no scientific reviews have been found in the literature that evaluate this issue.

OBJECTIVE

Therefore, the present study consists of a scoping literature review measuring the quality of information disseminated to the lay public addressing liposuction.

METHOD

The present study is a scoping review of the literature. The PRISMA-Scre checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review) was used to guide this scoping review⁹. A literature search was carried out from November 18 to December 12, 2021, on the following database platforms: Medline, Cochrane, LILACS, Embase, and VHL.

The search strategy involved the combination of the following descriptors: ("abdominal etching" OR "aspiration lipectomy" OR "aspiration lipectomies" OR "aspiration lipolysis" OR "body sculpting" OR "lipectomies" OR "lipectomies, aspiration" OR "lipectomies, suction" OR lipectomy OR "lipectomy, aspiration" OR "lipectomy, suction" OR lipoabdominoplasty OR "lipolysis, aspiration" OR "lipolysis, suction" OR liposculpture OR liposuction OR liposuctions OR lipoplasty OR lipoplasties OR "suction lipectomy" OR "suction lipectomies" OR "suction lipolysis") AND ("health communication" OR "educational communication" OR "health communications" OR "printed media" OR "population education" OR "health education" OR "patient education" OR "patient communication" OR "user information" OR "patient information" OR "information search" OR "information dissemination" OR "social media" OR Internet OR twitter OR "communications media" OR "search engine" OR "patient portals" OR comprehension OR "consumer health information" OR language OR reading OR instagram OR facebook OR "google trends" OR "Data Sharing" OR "Data Sharings" OR "Information Distribution" OR "Information Distribution" OR "Information Exchange" OR "Information Sharing" OR "Information Sharings" OR "Knowledge Dissemination" OR "Knowledge Sharing" OR "Sharing of Knowledge"). The bibliographic references of the selected studies were also checked to expand the list of articles of interest.

The inclusion criteria were articles of the type of randomized clinical trial, systematic review, or observational study in humans, with patients over 18 years of age, without publication date restrictions, in English, Portuguese, or Spanish, and studies with relevant results regarding the topic covered. The

exclusion criteria included dissertations, theses, animal studies, and those not presenting outcomes relevant to the proposed topic.

Two independent investigators read the abstract of studies obtained using the search strategy to evaluate those that met the eligibility criteria. In cases of disagreement, a third investigator participated in the screening process. The selected articles were read in full, and data related to publication date, type of study, platform studied, and evaluated outcomes were transferred to a spreadsheet fed jointly by the researchers.

This study was developed with the support of the Professional Master’s Course in Science, Technology, and Management Applied to Tissue Regeneration at

the Federal University of São Paulo (Unifesp). It was part of the research project entitled “Liposuction: preparation and validation of a book intended for the public layman.” This initiative was approved by the Unifesp Ethics and Research Committee on April 13, 2021, under opinion number 4,646,756 and CAAE 43920621.5.0000.5505.

RESULTS

Ten articles were selected for this scoping review. The processes of identification, screening, and inclusion of studies are represented in the flowchart in Figure 1.

To analyze the selected articles, Tables 1 to 3 were created.

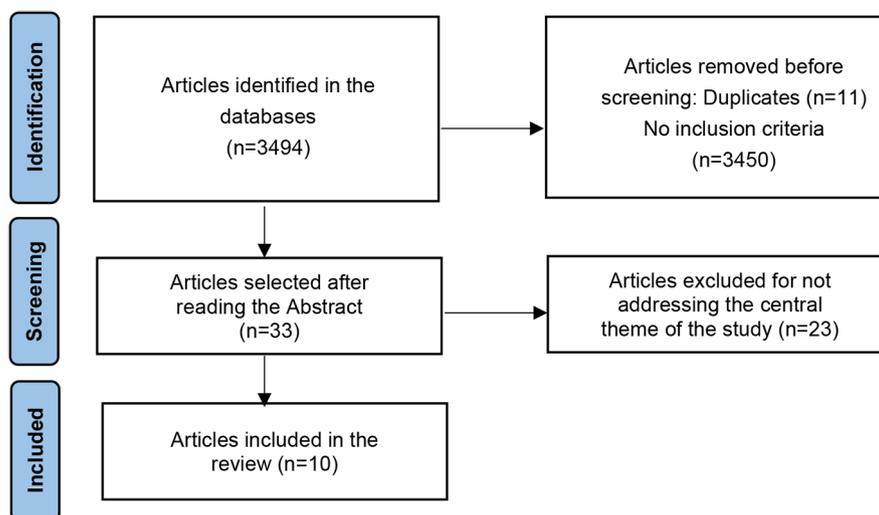


Figure 1. Flowchart for the selection of scoping review articles.

Table 1. Title, author, year, and country of articles.

Study	Title	Author	Year	Country
1	Can you trust what you watch? An assessment of the quality of information in aesthetic surgery videos on YouTube	Gray MC, Gemmiti A, Ata A, Jun B, Johnson PK, Ricci JA, et al. ¹⁹	2020	USA
2	Influence of social media on cosmetic procedure interest	Hopkins ZH, Moreno C, Secrest AM ¹²	2020	USA
3	YouTube for cosmetic plastic surgery: an effective patient resource?	Ward B, Ayyala HS, Zhang K, Manuskhani PA, Paskhover B, Lee ES ²¹	2020	USA
4	Social Media and the Plastic Surgery Patient	Sorice SC, Li AY, Gilstrap J, Canales FL, Furnas HJ ¹¹	2017	USA
5	Systematic review of the quality of patient information on liposuction on the Internet	Zuk G, Palma AF, Eylert G, Raptis DA, Guggenheim M, Shafighi M ¹⁷	2016	Switzerland
6	Online patient resources for liposuction: a comparative analysis of readability	Vargas CR, Ricci JA, Chuang DJ, Lee BT ¹⁸	2016	USA

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Table 1. Title, author, year, and country of articles.

Study	Title	Author	Year	Country
7	The influence of social media and easily accessible online information on the aesthetic plastic surgery practice: literature review and our own experience	Montemurro P, Porcnik A, Hedén P, Otte M10	2015	Sweden
8	Patient preferences in print advertisement marketing for plastic surgery	Sanan A, Quinn C, Spiegel JH13	2013	USA
9	The quality of Internet advertising in aesthetic surgery: an in-depth analysis	Wong WW, Camp MC, Camp JS, Gupta SC16	2010	USA
10	Representations of cosmetic surgery and emotional health in women's magazines in Canada	Polonijo AN, Carpiano RM20	2008	Canada

Table 2. Sample number, platform studied, and methodology of selected articles.

Study	Number of Sample	Platform Studied	Methodology
1	523 videos	YouTube	The YouTube platform was consulted in search of videos on 12 common topics in aesthetic surgical procedures, including liposuction. The first 25 videos for each term searched were selected and analyzed by three plastic surgeons, using the Ensuring Quality Information for Patients (EQIP) tool, based on the structure of the video, content and identification of the author.
2	14 terms	Google, Facebook, and Instagram	<p>Google Trends was consulted for US searches from January 2004 to December 2017 for the terms dermatologist, plastic surgeon, Botox, Juvederm, Radiesse, Restylane, CoolSculpting, Sculptra, Kybella, facelift, liposuction, rhinoplasty, blepharoplasty, and breast augmentation, as well as its alternative terms, such as generic or colloquial names for procedures.</p> <p>Univariable linear regression was used to evaluate trends and popularity of search terms on Google Trends over time.</p> <p>Pearson correlation was used to assess interest in the search term and social media growth, and the Benjamini-Hochberg adjustment was used for multiple comparisons.</p>
3	173 videos	YouTube	We evaluated the quality of the most likely videos patients will find when searching on YouTube about the most common plastic surgery procedures, including liposuction. According to Google Trends, the most common medical and colloquial terms on the topic were searched for relevance and view count. The top 10 for each term were collected and ranked using the DISCERN criteria - a score of 1 indicated high bias and low overall quality, and a score of 5 indicated the opposite.
4	100 patients	Quiz Application	A questionnaire on aesthetic surgery was administered to patients treated at two aesthetic clinics, through which they analyzed the profile of patients' use of social networks, the influence of social networks and the clinic's website on patient behavior; level of interest in different types of posts on social networks and the content considered most relevant on the company's website clinic
5	245	Websites	In a systematic review, they evaluate the quality of information about liposuction available to patients on the Internet. A quantitative and qualitative assessment of websites was based on a modified tool called <i>Ensuring Quality Information for Patients</i> (EQIP), with 36 items.
6	80 articles	Websites	We sought to identify the most commonly used online information about liposuction and assess its readability concerning average American literacy. An internet search was carried out using the term "liposuction." You ten most popular websites were identified, their articles were analyzed using established readability tests and compared with content that addressed the topic of tattooing

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Table 2. Sample number, platform studied, and methodology of selected articles.

Study	Number of Sample	Platform Studied	Methodology
7	Literature review with 19 articles; Studytransversal with 500 patients and 128 plastic surgeons	Databases and questionnaires	The impact of social networks and online information was determined through a survey of patients and plastic surgeons and a literature review.
8	404 people	Quiz Application	An online questionnaire was applied to 404 individuals interested in plastic surgery. Participants were presented with five different advertisements from plastic surgeons across the country, rating veracity, quality and commercialization of each advertisement.
9	Evaluation of advertisements according to codes of ethics: 2001 professionals Advertising preference assessment: 208 individuals	Websites and questionnaire	Doctors who perform aesthetic procedures in Southern California, USA, were listed. These professionals were categorized according to their specialty, and their websites were scored according to criteria from the code of ethics of the American Society for Aesthetic Plastic Surgery (ASAPS) and the American Society of Plastic Surgeons (ASPS). A geographic analysis determined whether the presence of many competitors impacted adherence to advertising ethical guidelines. A survey was conducted online to examine patients' preferences in medical advertising.
10	5 magazines	Magazines aimed at a female audience	We examined how popular women's magazines portray cosmetic surgery, liposuction, and emotional health. Articles on cosmetic surgery from five of the most circulated women's magazines in Canada were analyzed for the type of procedure, patient demographics, risk information, and emotional health indicators.

Table 3. Results and conclusions of the articles.

Study	Results and Conclusions
1	Five hundred twenty-three videos were evaluated, with an average score of 13.1 out of 27 possible points. Thus, it became clear that the information in cosmetic surgery videos on YouTube is low quality, and patients should be aware of this. It is suggested that plastic surgeons be encouraged to develop high-quality videos to educate the public.
2	The search terms that had increasing popularity were: Dermatologist, Botox, Juvederm, Radiesse, CoolSculpting, Kybella, and Facelift; already falling in popularity, they were Restylane, Liposuction, Rhinoplasty, and Mammoplasty. When looking at the relationship with the medical specialty, only the terms Juvederm and Facelift were associated with the search term dermatologist, while Sculptra, rhinoplasty, and blepharoplasty were only associated with plastic surgeons. The following terms that saw increased popularity were associated with Instagram and Facebook numbers: Dermatologist, Botox, Juvederm, Radiesse, CoolSculpting, and Kybella. This suggests increased online interest in non-invasive cosmetic procedures, potentially driven, in part, by social media.
3	Among the 143 videos identified, the average bias score was 2.29. Most of the videos were medical advertisements (31.79%) or patient reports (29.48%), with videos featuring plastic surgeons having the lowest average number of views but better overall quality, especially when produced by academic institutions. It is suggested, therefore, that plastic surgeons and academic organizations should strive to send unbiased, high-quality videos to provide patients with a more appropriate resource.
4	The network with the highest engagement was Facebook, while Twitter was the least popular and least engaged. The most popular publications were raffles/contests for free treatment or products, photographs with results (before x after), and information about the beauty clinic. Regarding the type of content of greatest interest on the site, photos comparing pre- and postoperative were chosen, followed by information about procedures.

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Table 3. Results and conclusions of the articles.

Study	Results and Conclusions
5	The quality of information available to patients about liposuction is very unsatisfactory. Few sites presented estimated morbidity and mortality rates. Less than a third of the sites mentioned potential postoperative complications or even death after the liposuction procedure, most of which were developed by private surgeons. Sites developed by academic centers and non-profit organizations provided a better quality of information than those developed by private surgeons.
6	Eighty articles were collected from websites about liposuction. Readability analysis revealed an average reading level of 13.6, exceeding the sixth-grade target. As a comparison, tattoo sites were significantly easier to read, averaging 7.8, and contained significantly fewer characters per word and words per sentence and a lower proportion of complex, long, and unfamiliar words. Thus, it was noted that online resources for patients about liposuction are potentially very difficult for a large number of Americans understand.
7	It was noted that 95% of patients used the Internet to collect information prior to the consultation, with 68% of them being the first search method. Social networks were used by 46% of patients, and 40% of these were strongly influenced when choosing a specific doctor. Most plastic surgeons (85%) thought that information found on social media could lead to unrealistic expectations. Furthermore, 45% of plastic surgeons believed that their consultations became easier after the advent of social networks, while 29% found them more difficult. In the review, they found a high percentage of low-quality plastic surgery websites and an increase in the use of social media among plastic surgeons. They suggest that, even though the Internet provides extensive information, it cannot replace face-to-face consultation, which should always be a thorough process covering both the risks and limitations of alternative procedures.
8	Half of those interviewed in this study have already undergone cosmetic procedures or plastic surgery, with 80% of all participants being women. As for the advertising pieces, the best evaluated by the participants were those that used light colors, which contained photos of doctors in their offices in a less formal way, realistic photos of patients, clear descriptions of services, and surgeons' credentials, in addition to simple messages and a layout without excess information, balanced the amount of text and images.
9	Board-certified plastic surgeons had the highest total ethical scores across specialties. No decrease in advertising quality was found in densely competitive environments. Patient research demonstrated a desire for a well-trained, board-certified plastic surgeon to perform their cosmetic procedures. Although plastic surgeons demonstrate greater overall compliance with the Advertising Code of Ethics, there is still room for improvement. With a wide variety of doctors offering the same aesthetic procedures, it is essential to maintain open, honest, and direct communication with the public.
10	Patterns of portrayal of the risks and benefits of aesthetic surgery were studied, and it was noticed that articles tend to present readers with detailed information about risks to physical health only. However, 48% of articles discuss aesthetic surgery's impact on emotional health, associating such procedures with improved well-being, regardless of the patient's pre-existing condition. Articles also tend to use accounts given by men to provide defining standards of female attractiveness. These findings indicate a medicalization of the female body. In short, the authors indicate that cosmetic surgery is generally portrayed as a risky – but worthwhile – option for women to improve their physical appearance and emotional health.

DISCUSSION

Access to the Internet and digital social networks offers content about liposuction quickly, directly, and accessible to most patients, and currently, they are the main search sites for non-specialist audiences.

Montemurro et al.¹⁰ concluded that, in five of the studies analyzed in their research, 37 to 81.8% of patients search for data before the consultation, with the Internet being the first source of research in 38.6 to 72% of cases. It can also be observed that, in 2016, according to Sorice et al.¹¹, the social network with the highest engagement regarding posts related to aesthetic surgeries (including liposuction) was Facebook, with the lowest engagement being Twitter. It was revealed that the public was more interested in

before versus after photos and, secondly, in information about the procedures. Furthermore, there is an increase in the popularity of online searches on social networks for non-invasive aesthetic procedures¹².

Regarding how advertisements about liposuction are presented, according to Sanan et al.¹³, the lay public prefers articles with little description, which balance images and words. No difference was shown between the use of real patients and models in the advertisements. For observers, the ideal would be a photograph of the professional “in action” in their work environment.

Although not included in this review, some articles provide relevant information about using the Internet for health education purposes. Vardanian et al.¹⁴ state that social networks are important tools for educating, engaging, publicizing, and communicating

directly with patients and professional colleagues. Jejurikar et al.¹⁵ go further in their article and report that the Internet has enormous potential to provide the public with health information. They suggest doctors guide their patients about the procedure and warn them that most websites do not offer reliable and trustworthy surgery information. They also indicate that plastic surgeons should select specific Internet pages - considered reliable sources - and redirect their patients to these sites. They believe that, when used correctly and based on scientific content, the Internet can complement the dialogue in the doctor's office.

It is also worth highlighting the content provided to the lay public regarding liposuction. Although Wong et al.¹⁶ concluded that plastic surgeons obtained the highest overall average scores from the American Society of Plastic Surgeons (ASPS) code of ethics regarding advertising and advertisements, there is an evident lack of information with high scientific content and accessible language among health professionals and the lay public.

Among the studies reviewed, the articles by Montemurro et al.¹⁰, Zuk et al.¹⁷, Vargas et al.¹⁸, Gray et al.¹⁹, Polonijo & Carpiano²⁰ and Ward et al.²¹ indicate that the considerations on aesthetic procedures provided to the lay public are very superficial and imprecise. It is therefore important to develop materials produced based on an elaborate scientific methodology to provide interested people with material of high scientific quality, which can help in understanding the procedure.

Furthermore, Montemurro et al.¹⁰ and Vargas et al.¹⁸ also state that the information published on websites is difficult for lay readers to understand due to the use of technical language. At this point, the authors could adapt medical jargon to colloquial and routine terms, disclosing the subject seriously but in a way easily understood by those interested.

It is also worth highlighting the use of biased images about liposuction, which often compare the results before and after the procedure, for example, published and shared by default on social networks. In these cases, tricks are often used to improve postoperative results: playing with lights and shadows, using Vaseline, taking photos at favorable angles.

Plastic surgeons mistakenly induce the lay public into a false sense of utopian results, unattainable for many patients, by publicizing their work in this way. In Brazil, the Federal Council of Medicine (CFM) currently does not allow the publication of "before and after" photographs (CFM Resolution n° 1,974/11)²²; however, the bad examples that occur abroad demonstrate the need for this topic to be discussed broadly and profoundly before any change in the CFM's positioning occurs in the future.

This scoping review has some limitations to be highlighted: the inclusion of materials only in English, Spanish, and Portuguese and the lack of a tool to evaluate the methodological quality of the selected studies. On the other hand, this review followed the PRISMA-Scr⁹ checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review), which increased its methodological reliability.

In short, currently, there is a lack of quality information in accessible language for the lay public to make readers (potential patients in the future) more informed about the procedure. As liposuction is one of the most performed plastic surgeries in the world and, therefore, of great interest to the general public, the authors consider that greater robustness of information intended for patients is necessary, especially in terms of the surgical procedure, qualitative and quantitative benefits, risks, treatment of complications and pre- and postoperative care. The exploration of different surgical techniques and alternatives to surgery could also be better addressed¹⁷.

CONCLUSION

Among the ten articles selected in the present study, nine report poor and inaccurate information about liposuction. Improving the scientific quality of materials intended for the lay public on liposuction becomes imperative.

COLLABORATIONS

- AHSS** Analysis and/or data interpretation, Conception and design study, Data Curation, Final manuscript approval, Methodology, Project Administration, Writing - Original Draft Preparation, Writing - Review & Editing.
- JCMP** Conception and design study, Conceptualization, Final manuscript approval, Methodology, Supervision, Validation, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing.
- AHST** Analysis and/or data interpretation, Data Curation, Writing - Original Draft Preparation.
- CMS** Analysis and/or data interpretation, Data Curation, Writing - Original Draft Preparation.
- GLS** Analysis and/or data interpretation, Data Curation, Writing - Original Draft Preparation.
- FCI** Conception and design study, Conceptualization, Final manuscript approval, Methodology, Supervision, Validation, Visualization.
- LMF** Final manuscript approval, Supervision, Writing - Review & Editing.

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