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Research Article

# Team climate in primary health care: a systematic review of the literature

## Clima de equipe na atenção primária à saúde: uma revisão sistemática da literatura

## *Clima del equipo en la atención primaria de salud: una revisión sistemática de la literatura*

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## Abstract

**Introduction:** Evaluating team climate is crucial in identifying challenges that health teams face when implementing interprofessional work processes. **Objective:** The aim of this study was to determine what the team climate in PHC is and whether there is an association between the team climate factor and the quality of care offered to the user. **Methods:** This study aimed to conduct a systematic literature review to define primary health care team climate and determine whether an association exists between team climate and healthcare quality. The protocol was registered under protocol number CRD 42019133389 with the International Prospective Register of Systematic Reviews (PROSPERO). A search for articles on team climate in primary health care was conducted using any version of the team climate inventory instrument in six databases. There were no restrictions on the publication date or language (Spanish, English, and Portuguese). **Results:** Of the 1,106 studies obtained after removing duplicates, 23 were selected for a full reading based on abstract evaluations. It was observed that teams with better work climates achieved better health care outcomes. However, due to methodological heterogeneity between studies, it was not possible to determine an average value for primary health care team climate as initially proposed. **Conclusions:** The study concluded that, although there are indications of a possible positive association between the team climate and the quality of health care in primary health care settings, there are still not enough studies to allow us to categorically state that this association exists.

**Keywords:** Workforce; Primary health care; Family health strategy; Interprofessional education.

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## Resumo

**Introdução**: Avaliar o clima da equipe é fundamental para identificar os desafios que as equipes de saúde enfrentam na implementação dos processos de trabalho interprofissional. **Objetivo:** O objetivo deste estudo foi determinar qual é o clima da equipe na APS e se há associação entre clima da equipe e a qualidade da assistência oferecida ao usuário. **Métodos:** Este estudo teve como objetivo realizar uma revisão sistemática da literatura para definir o clima da equipe de atenção primária à saúde e determinar se existe uma associação entre o clima da equipe e a qualidade do cuidado. O protocolo foi registrado sob o número de protocolo CRD 42019133389 no International Prospective Register of Systematic Reviews (PROSPERO). Uma busca de artigos sobre clima de equipe na atenção primária à saúde foi realizada usando qualquer versão do instrumento de inventário de clima de equipe em seis bases de dados. Não houve restrições quanto à data de publicação ou idioma (espanhol, inglês e português). **Resultados:** Dos 1.106 estudos obtidos após a remoção de duplicatas, 23 foram selecionados para uma leitura completa com base nas avaliações dos resumos. Observou-se que equipes com melhores climas de trabalho alcançaram melhores resultados de saúde. No entanto, por causa da heterogeneidade metodológica entre os estudos, não foi possível determinar um valor médio para o clima da equipe de atenção primária à saúde como proposto inicialmente. **Conclusões:** O estudo concluiu que, embora existam indícios de uma possível associação positiva entre o clima da equipe e a qualidade da atenção à saúde em ambientes de atenção primária à saúde, ainda não existem estudos suficientes que nos permitam afirmar categoricamente que essa associação existe.


**Palavras-chave:** Equipe de trabalho; Atenção primária à saúde; Estratégia de saúde da família; Educação interprofissional.


## Resumen

**Introducción**: Evaluar el clima de equipo es fundamental para identificar los desafíos que enfrentan los equipos de salud en la implementación de procesos de trabajo interprofesional. **Objetivo:** El objetivo de este estudio fue determinar cuál es el clima de equipo en la APS y si existe asociación entre el clima de equipo y la calidad de la atención ofrecida al usuario. **Métodos:** Este estudio tuvo como objetivo realizar una revisión sistemática de la literatura para definir el clima del equipo de atención primaria de salud y determinar si existe una asociación entre el clima del equipo y la calidad de la atención. El protocolo fue registrado con el número de protocolo CRD 42019133389 en el Registro Prospectivo Internacional de Revisiones Sistemáticas (PROSPERO). Se realizó una búsqueda de artículos sobre clima de equipo en atención primaria de salud utilizando cualquier versión del instrumento de inventario de clima de equipo en seis bases de datos. No hubo restricciones de fecha de publicación ni de idioma (español, inglés y portugués). **Resultados:** De 1106 estudios recuperados después de eliminar los duplicados, 23 fueron seleccionados para una lectura completa basada en calificaciones de resúmenes. Se observó que los equipos con mejores climas de trabajo lograron mejores resultados de salud. Sin embargo, debido a la heterogeneidad metodológica entre los estudios, no fue posible determinar un valor promedio para el clima del equipo de atención primaria de salud como se planteó inicialmente. **Conclusiones:** El estudio concluyó que, aunque hay indicios de una posible asociación positiva entre el clima de equipo y la calidad de la atención en salud en los entornos de atención primaria de salud, aún no hay suficientes estudios que permitan afirmar categóricamente que esta asociación existe.


**Palabras clave:** Recursos humanos; Atención primaria de salud; Estrategia de salud familiar; Estrategia de salud familiar; Educación interprofesional.

# INTRODUCTION

Primary Health Care (PHC) is the main strategy for reorienting health services in Brazil, with the Family Health Strategy (FHS) serving as the model that guides PHC organization. The positive impact of the FHS on the provision of primary health care and on the population's health has been well established.[1-3]

Interprofessional teamwork can be understood as a form of collective collaboration that manifests itself in the interconnection between the technical activities carried out and the interactions between the different participants involved.[4] Teamwork is crucial to promoting integrality in health care, with interdisciplinary and interprofessional actions aiming to provide comprehensive and longitudinal care, which can respond to the complex and dynamic health needs of patients, and to put the user at the center of the health service production process.[4-6] However, social and cultural factors, such as differentiated social valorization between health workers, often result in the establishment of subordinate relationships between the different health professionals, compromising the organization of services from an expanded view of health.[4-7,8] The literature highlights critical and necessary factors for teamwork to occur, such as interprofessional communication and collaboration, goal sharing, recognition of other team members' work, and user-centered care.[9]

In this context, team climate is considered a work analysis tool that allows an operational approach to teamwork in health services. It is defined as the set of conceptions and meanings shared by the team members regarding the practice and procedures they experience during work.[10] The Team Climate Inventory (TCI) is an instrument that contributes to the assessment of the organizational climate focused on health services.[11] The aim of this study was to determine what the team climate in PHC is and whether there is an association between the team climate factor and the quality of care offered to the user.

## METHODS

### Study type, protocol and record

This systematic review was registered in the International Prospective Register of Systematic Reviews (PROSPERO)[12] under protocol number CRD 42019133389 and is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Statement).[13] The literature search was guided by the following questions: What is the nature of team climate in Primary Health Care? Is there an association between the quality of care provided in primary health care and team climate?

### Eligibility criteria

We included studies that evaluated primary healthcare professionals working in a multiprofessional environment. The primary outcome was Primary Health Care Team Climate measured by any version of the TCI,[14] which is an instrument that contributes to the assessment of the organizational climate focused on health services.

The original TCI consists of 65 items (six subscales)[15] or 61 items (four subscales).[11] Later, several shorter versions were developed and applied, with 44,[16] 38[17] or 14[18] items. The TCI has been adapted and validated in several countries and in different languages,[19-21] showing good psychometric properties.[21] Only observational studies, such as cohort, case-control, and cross-sectional studies were included.

### Information sources

We conducted searches for studies in the following electronic databases: PubMed, Scopus, Embase, The Cochrane Library, Biblioteca Virtual em Saúde (BVS), Caribbean Health Sciences (LILACS) and Web of Science. We also manually searched the reference lists of potential studies to be included and previously published systematic reviews.

### Search strategies

The search strategies were developed utilizing controlled vocabulary terms tailored to each database, along with free terms like the phrase “Team Climate Inventory,” in order to ensure the retrieval of studies that employed this tool for data collection. Terms associated with PHC were integrated with those related to team climate characteristics and the quality of care delivered, with the aim of addressing

the research questions posed. The search was tailored for each database individually (Table S1 of the Supplementary Material).

### Selection process

After removing duplicate studies, two reviewers (JV and MNSH) independently screened the titles and abstracts in duplicate. The studies selected at this stage were then independently evaluated for eligibility by reading the full texts by the same two reviewers (JV and MNSH) in duplicate; in case of disagreement, a third reviewer analyzed the data to cancel it. The study selection process was performed in the Rayyan™.[22]

### Data collection process and data items

Two researchers independently analyzed the included studies by collecting data and completing a pre-structured form in Microsoft Excel software. The form was created in advance and contained domains for characterizing the studies, including population, exposure, version of the TCI used, main results, and study type.

### Study risk of bias assessment

The risk of bias in the included studies was evaluated using the Newcastle-Ottawa Scale (NOS) tool, which has been validated for cohort and case-control studies and adapted for cross-sectional studies.[23,24] The tool employs a star rating system, with the highest-quality longitudinal studies receiving up to nine stars and cross-sectional studies up to ten stars. The two reviewers (JV and MNSH) independently performed the risk assessment process in duplicate; in case of disagreement, a third reviewer analyzed the data to cancel it.

### Synthesis methods

We present a descriptive synthesis of all data in tables, as it was not feasible to conduct a meta-analysis due to the methodological heterogeneity of the studies.

## RESULTS

### Study selection

Initially, 1,475 references were obtained from the searched databases. After removing 369 duplicate articles, 1,106 references were screened using the Rayyan™[22] tool for systematic reviews to evaluate titles and abstracts. Two reviewers independently conducted this screening in duplicate, resulting in the exclusion of 1,083 articles at this stage. Next, 23 full-text articles were independently assessed in duplicate by the two reviewers to confirm eligibility, and 12 articles were excluded. The selection process for each stage of study selection is described in detail in Figure 1.

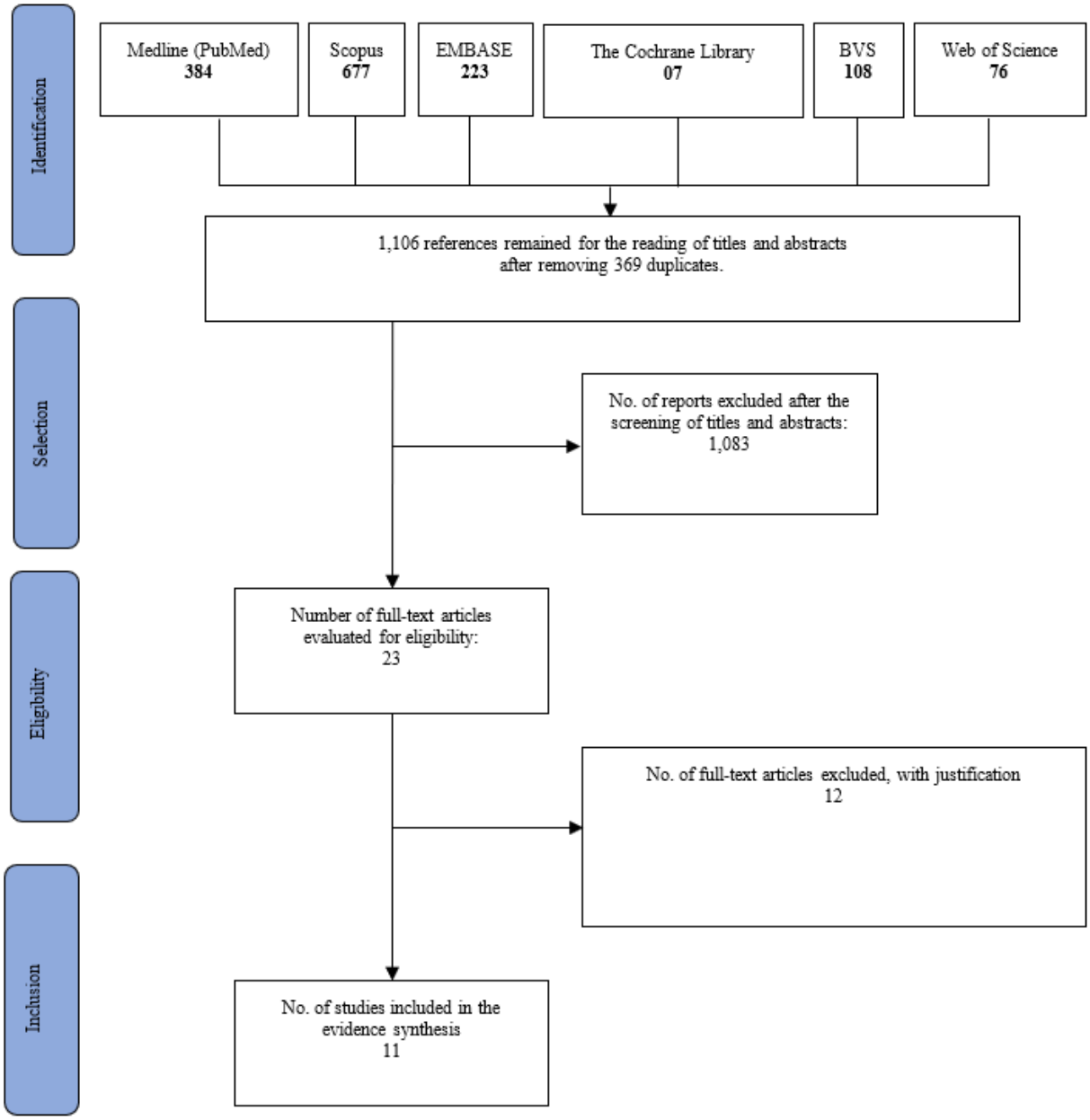


**Figure 1.** Flowchart of the study selection steps for the systematic review of the literature according to the inclusion criteria - Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram.[13]

## Study characteristics

The eleven articles included in this review had a range of participating professionals, from 107 to 720. Four studies aimed to link team climate results to the quality of care, either by analyzing data from medical records of patients treated by the teams during a certain period or by interviewing these patients.[25-28] The number of patients included in these studies varied from 732 to 2,066.

Table 1 presents the main results of interest for the teamwork climate factor. The authors presented the results in different ways, either by the overall mean value for each item,[26,29-31] the total value per factor[32,33] or the mean value per factor.[26-28,31,34]

**Table 1.** Main results of the included studies.

| Study | Diagnosis classification** | Team Composition | | | | | | | | | | Team Climate Inventory | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Family Physician / General Practitioner | Nurse | Social worker | Pharmacist | Dentist | Auxiliary team | Community Health Agent | Other | Total disciplines | Team composition type | Version | Participative safety | Support for innovation | Task orientation | Team vision | Total score |
| Agreli et al., 2017 | NA | 17 | 16 | X | X- | 6 | 24 | 81 | X | 5 | 1 | TCI-38 | Total: 46.2 | Total: 29.8 | Total: 35.4 | Total: 56.5 | NR |
| Bosch et al., 2008 | Type 2 diabetes | X | X | X | X | X | X | X | X | 2 | 2 | TCI-44 | Mean: 1.83 | Mean: 2.1 | Mean: 1.9 | Mean: 1.8 | Mean: 1.9 |
| Brown et al., 2015 | NA | 27 | 16 | 10 | 3 | X | 13 | X | 38 | 8 | 1 | TCI-14 | NR | NR | NR | NR | Mean: 3.8 |
| Hann et al., 2007 | Diabetes, Angina or Asthma | X | X | X | X | X | X | X | 492 | NR | 1 | TCI-65 | NR | NR | NR | NR | Total: 49-79* |
| Howard et al., 2011 | NA | 91 | X | X | X | X | 167 | X | 210 | 5 | 1 | TCI-14 | Mean: 3.8 | Mean: 3.7 | Mean: 3.5 | Mean: 3.7 | Mean: 3.8 |
| Mundt et al., 2016 | Type 1 and Type 2 diabetes | 20 | 60 | X | X | X | 31 | X | 44 | 6 | 1 | TCI-14 | Mean: 11.4 | Mean: 7.9 | Mean: 8.5 | Mean: 12.8 | NR |
| Ndibu et al., 2019 | NA | 15 | 94 | X | X | X | X | X | 206 | 4 | 1 | TCI-19 | NR | NR | NR | NR | Mean: 5.1 |
| Poulton et al., 1999 | NA | 106 | 100 | X | X | X | X | 63 | 141 | 7 | 1 | TCI-65 | Total: 42.6 | Total: 27.9 | Total: 29.1 | Total: 53.5 | NR |
| Proudfoot et al., 2007 | Chronic diseases | 259 | 82 | X | X | X | X | X | 303 | 3 | 1 | TCI-44 | Mean: 3.9 | Mean: 3.8 | Mean: 3.7 | Mean: 3.9 | NR |
| West et al., 1997 | NA | 140 | 152 | NR | NR | NR | 168 | 75 | 27 | NR | 1 | TCI-65 | Mean: 3.5 | Mean: 3.4 | Mean: 4.4 | Mean: 4.8 | NR |
| Willians et al., 1999 | NA | NR | 83 | NR | NR | NR | NR | 51 | 125 | NR | 1 | TCI-65 | Total: 34.7 | Total: 34.7 | Total: 17.8 | Total: 9.7 | NR |

Team composition type: 1: highly multidisciplinary primary care teams (3 areas or more); 2: traditional primary care teams (doctor-nurse centered); where the exact number of professionals was not reported, the professional categories that participated in the study were identified with an X; *result presented as shown in the original manuscript; **this involves the presence or absence of an analysis of the relationship between teamwork climate and the quality of care in patients with certain diseases highlighted in this column; NA: not applicable; NR: not reported.

Regarding the sample composition, most studies used similar criteria, including health professionals from different areas to obtain the teamwork climate results. Eight studies included three or more categories,[25,29-35] one included two or fewer professional categories,[26] and two reported only that the sample consisted of health teams without informing which professional categories were included in these samples.[34,35]

There was an even greater variation regarding the instrument version used to collect data. Among the studies, we identified five different versions of the TCI with respect to the number of items: a version with 65 items,[25,32,34,35] a version with 44 items,[26,28] a version with 14 items,[27,29,31] another with 38 items[33] and yet another with 19 items.[30]

*Risk of bias in studies*

The risk of bias in the included studies is presented in Table 2, which shows the overall score according to the modified Newcastle Ottawa Scale for cross-sectional studies, as proposed by Modesti et al.[24] As only cross-sectional studies were included in this review, this scale was used to assess the risk of bias. The scores ranged from 5 to 6, with a consensus reached between the two reviewers in all cases.

**Table 2.** The modified Newcastle Ottawa Scale for cross-sectional studies proposed by Modesti et al.[24] Average score: 10.

| Study | Selection | | | | Comparability | Outcome | | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 1 | 2 | |
| Agreli et al., 2017 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Bosch et al., 2008 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Brown et al., 2015 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Hann et al., 2007 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Howard et al., 2011 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Mundt et al., 2016 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Ndibu et al., 2019 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Poulton et al., 1999 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| Proudfoot et al., 2007 | ★ | - | ★ | ★ | - | ★ | ★ | 5 |
| West et al., 1997 | ★ | - | ★ | ★ | ★ | ★ | ★ | 6 |
| Willians et al., 1999 | ★ | - | ★ | ★ | ★ | ★ | ★ | 6 |

Scale cross-sectional studies: Selection: (Maximum 5 stars) 1) Representativeness of the sample: a) Truly representative of the average in the target population. *(all subjects or random sampling) b) Somewhat representative of the average in the target population. *(non-random sampling) c) Selected group of users. d) No description of the sampling strategy. 2) Sample size: a) Justified and satisfactory. *b) Not justified. 3) Non-respondents: a) Comparability between respondents' and non-respondents' characteristics is established, and the response rate is satisfactory. *b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory. c) No description of the response rate or the characteristics of the responders and the non-responders. 4) Ascertainment of the exposure (risk factor): a) Validated measurement tool. **b) Non-validated measurement tool, but the tool is available or described. *c) No description of the measurement tool. Comparability: (Maximum 2 stars) 1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled. a) The study controls for the most important factor (select one). *b) The study control for any additional factor. *Outcome: (Maximum 3 stars) 1) Assessment of the outcome: a) Independent blind assessment. **b) Record linkage. **c) Self-report. *d) No description. 2) Statistical test: a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *b) The statistical test is not appropriate, not described or incomplete.

## DISCUSSION

Some findings suggest an association between team climate and improvement in the quality of care, although the TCI was not created with the aim of predicting the quality of care, but rather to assess and predict situations related to the work process. However, it is not possible to categorically state that there is an association between these two factors, given the small number of studies that point to this correlation. From this perspective, considering the work process in the PHC as a constitutive factor for the fulfillment of its attributes, it is possible to observe the association of the team climate dimension with structuring elements of the team, work procedures and health outcomes, which will be discussed below. Regarding the structural elements, the length of time working as part of the team was associated to the work climate, and it was observed that the longer the professionals' mean working time as part of the team, the worse the results regarding the work climate.[29] This result may be explained by the hypothesis the lack of experience at work and lack of knowledge of the other team components observed in younger professionals and/or those with less time in the team may imply the need for validation of these professionals by those who have been part of the team for a longer period.[30]

As for the outcome measures impacted by the team climate, it is highlighted that teams that had a better team climate were associated with better results regarding the quality of care offered to patients with diabetes, taking into account the factors: access to care, continuity of care, and general user satisfaction.[28] It is therefore possible to associate the assessment of the team climate as an important promoter of the success or not of the fulfillment of essential attributes of PHC.[36] This finding is unanimous to what the proponents of the TCI instrument say, who consider the team climate to be relevant and crucial for the consolidation of the work processes within the PHC scope and categorize it as a predictor of health actions and desired results regarding the attention to the health-disease process.[11]

Two studies[34,35] showed that, in view of the comparison of the results related to the team climate in PHC and other services, the results of PHC were significantly lower. Both studies were carried out in the United Kingdom, in the context of the British National Health Service (NHS). The explanation for this finding lies in the understanding of the context of the formation of these teams, characterized by wage and hierarchical differences between the professional categories and by difficulties in establishing the clarity of roles and the sharing of objectives, causing conflicts in the work teams.[34,35] Such barriers to the performance of teamwork are easily found in the literature, not only in the context of the NHS, being considered critical points for teamwork to occur in PHC.[7,9]

The team climate was associated with the cost-effectiveness of health services, being inversely proportional to health spending.[27] This finding is supported by the fact that teamwork results in better cost-effectiveness in health care.[37] This association reveals the importance of the appropriate and frequent use of the TCI, showing health managers the relevance of evaluating this issue among the teams that constitute the health care network, in order to optimize the commitment of financial resources and provide greater service effectiveness.

Despite findings that suggest that a better team climate may be correlated with better results from health services, it was also possible to identify studies that did not observe this correlation.[25,26] This makes it even more difficult to categorically state that such a correlation exists although it is an expected result, bearing in mind that several studies point to a correlation between better teamwork and better results produced by health services,[1,38-41] a logic that points to the teamwork process as one of the pillars of PHC.

Despite the difficulty found regarding methodological heterogeneity among the studies on the topic proposed here, which made it impossible to define an average value for the team climate in PHC, this proved to be an important factor to be considered with the purpose of predicting factors related to the work process and quality of health care.

This study showed that there is a limited number of publications related to the team climate. Although the TCI has shown to be a validated instrument, there is no single standard for its application in existing studies, which adopted very different methodological designs, implying that it is impossible to obtain a single value for the teamwork environment in PHC, summary and generalization of the findings. For this reason, a meta-analysis has become unfeasible. This same difficulty was reported in a previous systematic review,[42] which addressed only studies carried out in the United Kingdom, published in English and without including gray literature, limitations that were not used in this new systematic review on the subject.

In addition to this limitation, it was observed that, regarding the risk of bias, the vast majority of studies[25,33] did not score the comparability because they only evaluated PHC health professionals, making it impossible to compare the impact of the results of the team climate on the PHC team with those obtained in other health services. In addition, two of the studies that compared groups[34,35] performed a non-random selection of PHC worker samples, which increased the risk of bias.

It is necessary to carry out new studies to understand how the team climate influences the factors related to the quality of care, using a standardized design, which will allow reproducibility, comparisons and, consequently, a better interpretation of the results. In view of the complexity inherent in the teamwork process, especially in the PHC context, it is suggested that, in addition to quantitative studies, mixed studies should be carried out, making it possible to expand the procedural paths experienced by health teams and the effects of this expansion. This approach perspective may provide evidence that extrapolates quantitative (objective) issues, bringing qualitative data (subjective, procedural) to the discussion, which, when intertwined / triangulated, may reveal more precisely the impacting dimension of the association of the team climate and health care, especially in the context of PHC.

## CONCLUSION

It was concluded that, although there are indications of a positive correlation between team climate and the quality of health care, it is not possible to categorically state that this correlation exists. This fact reinforces the importance of further studies on this possible relationship between these factors. Due to the methodological heterogeneity among the studies listed here, it was not possible to determine an average value for the teamwork environment in PHC, as initially proposed. For this purpose, it is necessary to carry out new studies, using reproducible methodological designs in the context of PHC.

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## CONFLICT OF INTERESTS

Nothing to declare.

## AUTHORS' CONTRIBUTIONS

JV: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Writing – Original Draft, Writing – Review & Editing. LFP: Conceptualization, Writing – Original Draft, Writing – Review & Editing, Methodology. MVC: Writing – Original Draft. MNSH:Data Curation. MLMS: Writing – Original Draft. ADDC: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Writing – Original Draft, Writing – Review & Editing, Supervision.

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