



# Quality Assessment of Cohort Studies in Complementary and Alternative Medicine: A Scoping Review Over Two Decades

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## Abstract

**Background:** We aimed to investigate the subject matters and the quality of publications detailing the findings of cohort studies within the realm of complementary and alternative medicine (CAM).

**Methods:** A scoping review was conducted on cohort studies in the CAM field up to the conclusion of 2023. The evaluation of their quality was carried out utilizing the 'Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) checklist. Moreover, an analysis of their research settings and associated variables, including publication year, type of disease, intervention method, and study field, was conducted.

**Results:** Overall, 215 articles were identified. The majority of these cohorts, approximately 42.3%, originated from Taiwan, with stroke and cardiovascular diseases emerging as the most prevalent outcomes of interest. The mean STROBE score was 1.38 (SD=0.57) out of 2. The lowest scores were associated with the methods and funding sections. Methodologically, the principal weaknesses were linked to sample size, loss to follow-up, and bias control.

**Conclusion:** The frequency of cohort studies in CAM was limited, predominantly concentrated in a few countries. Chinese medicine and acupuncture were the main intervention methods, while other CAM interventions received less focus. Furthermore, the quality of these studies was deemed unsatisfactory in most cases.

**Keywords:** Scoping review; Quality assessment; Cohort studies; Complementary therapies

## Introduction

The cohort study design, as an applicable method, is commonly employed in research, with its outcomes ranking second only to randomized controlled trials (1). Cohort investigations allow researchers to gain insights into the outcomes or natural progression of a disease or condition within a specific study population (2). Despite cohort studies being more susceptible to bias and

confounding compared to RCTs (3), they remain popular in the field of Complementary and Alternative Medicine (CAM). This is because cohort studies offer high external validity and can more accurately depict the impacts of CAM interventions (4). Furthermore, they do not face certain limitations present in interventional studies, such as ethical considerations, high costs, and con-



straints on the size or duration of follow-up (5, 6).

Cohort studies in the realm of CAM possess unique characteristics. In this field, CAM interventions are regarded as exposure factors when conducting cohort studies (7). These studies typically center on disease prognosis (8), efficacy assessment (9), economic evaluation (10), and adverse events (11) when evaluating CAM interventions.

Although there is no single accepted tool for evaluating study quality (12), it is crucial to evaluate the overall quality of studies (13). Insufficient reporting obstructs the ability to make well-informed decisions, which could have serious repercussions when ineffective or harmful treatments are supported, ultimately leading to a waste of research endeavors (14). The "Strengthening the Reporting of Observational Studies in Epidemiology" (STROBE) guideline is currently a commonly used tool for assessing the quality of observational studies (15). Many journals have incorporated the STROBE statement as submission guidance to enhance the quality and transparency of health research (16, 17).

A scoping review is an appropriate approach for defining the subject, domain, context, idea, or problem being examined. The primary aim of conducting a scoping review is to identify and chart pertinent evidence (18). Scoping reviews, as an alternative, have become increasingly popular, when systematic reviews may not fully achieve the intended objectives (19). Scoping reviews provide various benefits, such as synthesizing a growing literature to pinpoint research gaps and highlight areas for future studies. Moreover, they are suitable for addressing exploratory research questions (20).

To the best of our knowledge, no review has been done to analyze the subject and report the quality of cohort studies in the CAM field. Recognizing the deficiencies in these articles can facilitate progress toward standardized reporting. In this study, we utilized a scoping review to conduct descriptive statistics and evaluate the reporting quality of cohort studies in CAM using the STROBE criteria.

## Methods

A scoping review study was conducted to examine the topic and assess the quality of cohort studies in CAM. We defined six steps in our scoping review: 1) search strategy; 2) searching databases; 3) assessment of inclusion and exclusion criteria; 4) assessment of reporting quality; 5) data collection; 6) analysis.

### *Search strategy*

We combined two sets of keywords to search the databases. The first set defined different types of interventions in CAM, and the second set defined cohort studies as follows: (acupuncture OR ayurveda OR homeopathy OR naturopathy OR chinese OR chiropractic OR osteopathic OR massage OR dance OR tai chi OR yoga OR herbal OR electromagnetic OR reiki OR qigong OR meditation OR biofeedback OR hypnosis OR reflexology OR persian OR irani OR iranian OR dancing OR complementary OR alternative) AND (cohort studies OR longitudinal studies OR prospective OR retrospective). On February 9, 2024, we searched the main international and persian databases such as PubMed, ISI Web of Science, Scopus, Google Scholar, Science Information Database SID (WWW.SID.ir), and MagIran (WWW.Magiran.com). English articles that were published from 1947 to December 31, 2023, were extracted.

### *Inclusion and exclusion criteria*

This scoping review encompassed cohort studies investigating specific facets of CAM. Exclusion criteria comprised randomized trial designs, other observational studies, systematic reviews and meta-analyses, guidelines, letters to the editor, conference abstracts or articles, and animal experiments.

### *Reporting quality assessment*

The quality of the articles was evaluated using the STROBE checklist (15), which is a tool designed to assess the reporting quality of observational studies. The STROBE Statement includes a

checklist with 22 essential items that should be included in the reporting of observational studies. These items cover various sections of the article, such as the title and abstract, introduction, methods, results, discussion, and additional information like funding. While 18 items are common to all three study designs, there are four design-specific items that have different versions. Some items require specific information for cases and controls in case-control studies, or for exposed and unexposed groups in cohort and cross-sectional studies. Although there is a unified checklist, separate checklists tailored to each of the three study designs are also available. The tools and metrics used to assess the quality of the articles were based on a ratio scale. Each case was scored on a scale ranging from zero to two: zero indicating "not reported," one indicating "inadequately described," and two indicating "adequately described" (21). All items were assigned equal importance, and if certain items were not relevant to a particular study, they were labeled as "not applicable."

### ***Bias control***

To guarantee a thorough examination of the available evidence in our scoping review, we took into forms of bias that may arise in such reviews and implemented strategies to address them, as mentioned below:

Selection bias is a concern in scoping reviews, as it can arise from an incomplete or biased search strategy that overlooks relevant studies. To control this issue, we incorporated two sets of keywords in our search strategy and included all relevant terms. Additionally, we incorporated "grey literature" in our extensive research. Another possible bias in scoping reviews is reporting bias, which occurs when researchers choose to report specific outcomes or analyses from a study. To mitigate the effects of reporting bias, we employed clear and systematic approaches for selecting studies, extracting data, and conducting analysis. Furthermore, there were no conflicts of interest.

### ***Choosing and assessing the articles***

The articles underwent a two-stage selection and evaluation process: an initial screening based on title and abstract, followed by a full-text review of potentially relevant articles. Rigorous training was provided to two data collection personnel to reduce human errors, and reviewers possessed expertise relevant to the scoping review topic. Training was also conducted on proper data extraction techniques to minimize subjective interpretations. Two reviewers independently assessed the retrieved studies, and any discrepancies in the findings were resolved through deliberation with a third expert to reach a consensus. To evaluate agreement and consistency between two reviewers Kappa statistics were employed, resulting in a kappa coefficient of .8. In addition, we utilized a standard checklist (STROBE) to prevent instrumental errors and misclassifications.

### ***Collecting data***

In this research, data concerning the variables of publication year, type of disease, method of intervention, study field, control selection method, outcome, follow-up period, and geographic distribution of articles were documented.

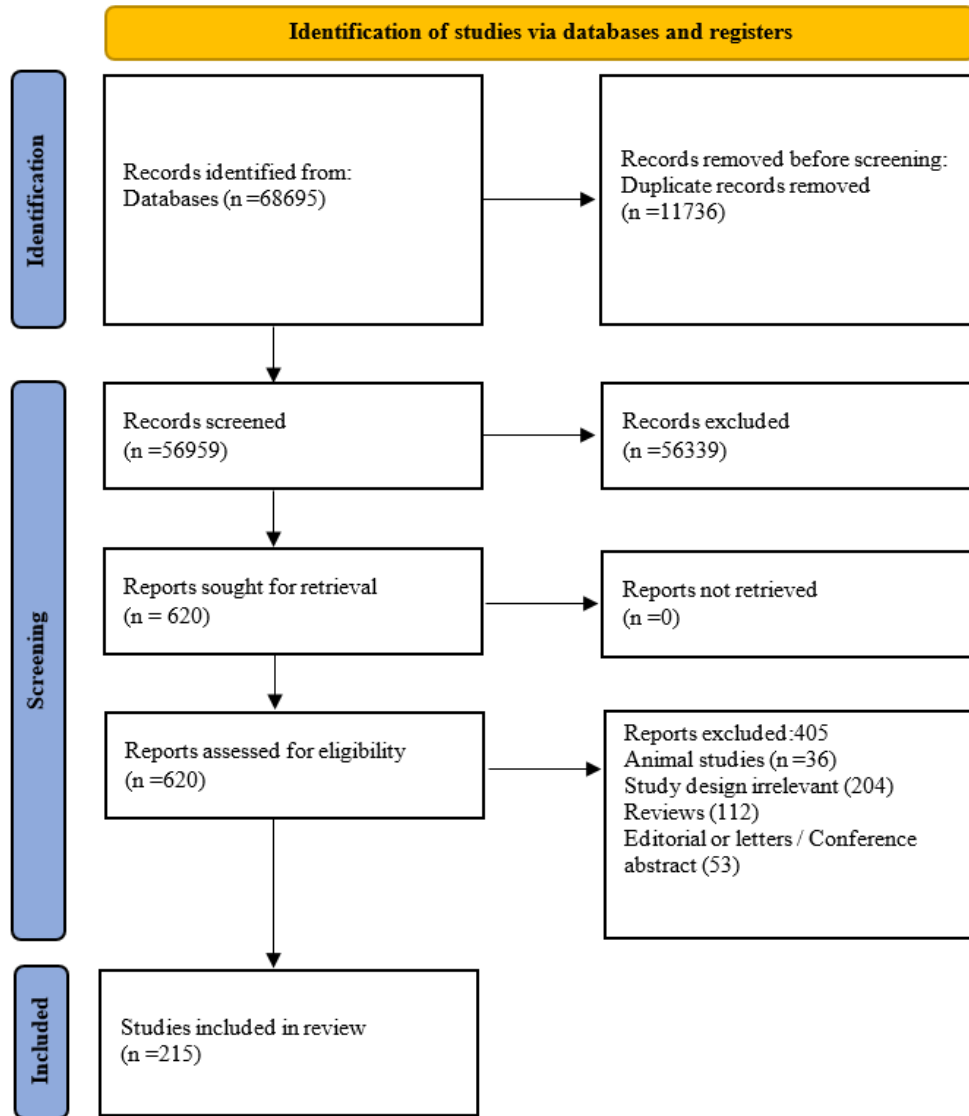
### ***Statistical Analysis***

Each STROBE checklist item was analyzed to determine the frequency, relative frequency, mean, and standard deviation (SD) of the scores using Stata version 14.2 (Stata Corp, College Station, TX, USA). The geographical distribution of articles in CAM was visualized using ArcMap version 10.8. To evaluate the degree of self-correlation among the studies and the potential for clustering, we utilized Moran's overall test. Additionally, we selected six classes and manual methods to map and separate various regions. Data trend was analyzed using the Join Point Regression Program (ver. 5.2.0.0). A *P*-value of less than 0.05 was considered statistically significant. Additionally, the frequency of studied diseases in CAM was displayed using MAXQDA ver. 2018.

## Results

Overall, 68,695 articles were initially identified. Following the removal of duplicates and screen-

ing based on the title and abstract, 620 articles were retained for full-text review. Ultimately, 215 articles were deemed eligible for inclusion (Fig. 1).



**Fig. 1:** PRISMA flow diagram for selection of eligible studies

A descriptive examination of the articles was conducted. The predominant intervention methods discussed in the cases were Chinese medicine and acupuncture. Additionally, the most extensively researched area pertained to neoplasms

(Fig. 2). Furthermore, the predominant control selection method used was blank control, with the primary objective of the studies being to assess the effect of the intervention (Fig. 3).

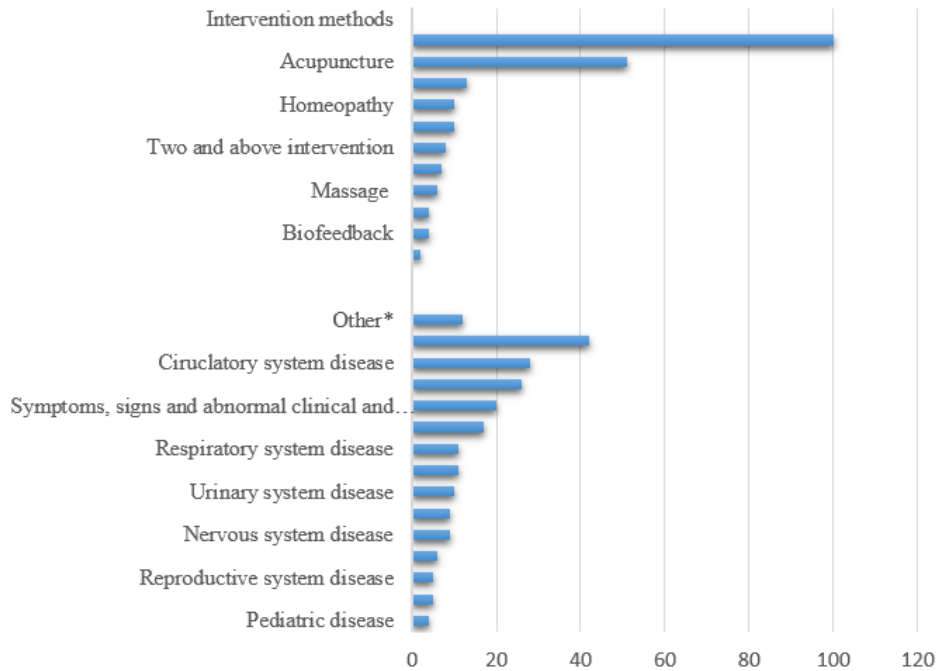


Fig. 2: The main characteristics of complementary and alternative medicine cohort studies up to the end of 2023

\*Quality of life (2 articles), Insomnia (2 articles), Dementia (1 article), Rehabilitation (3 articles),

Adverse drug reactions (1 article), Chronic disease (2 articles), Financial impact (1 article).

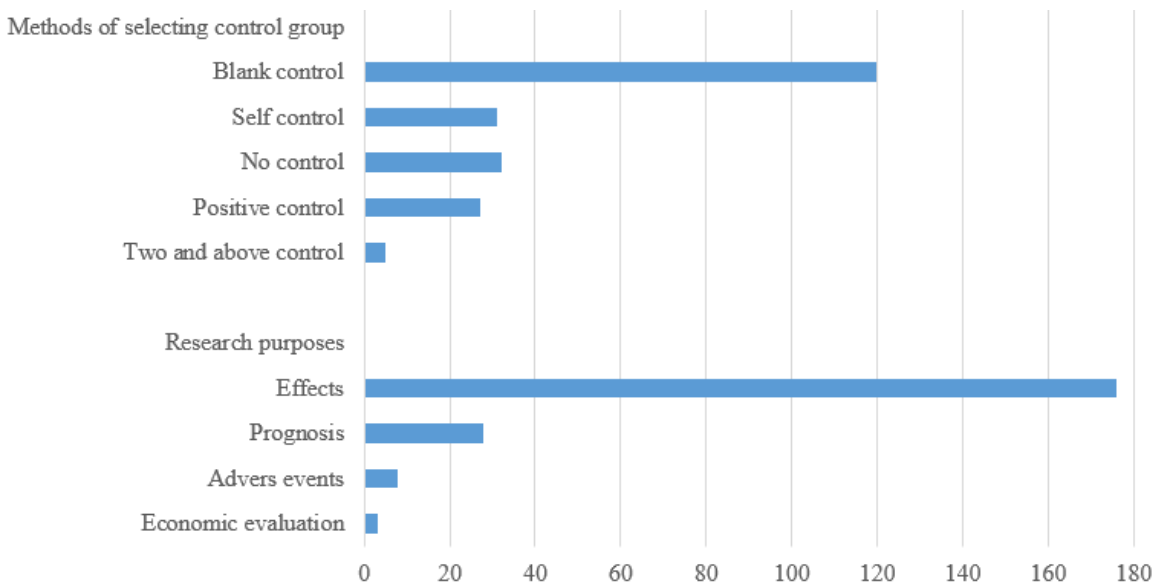


Fig. 3: The frequency of control group selection methods and research objectives in cohort studies on complementary and alternative medicine until the end of 2023

The majority of cohort studies were conducted retrospectively, with an average follow-up period of 47 months. Retrospective-prospective studies had the highest average sample size. Out of the

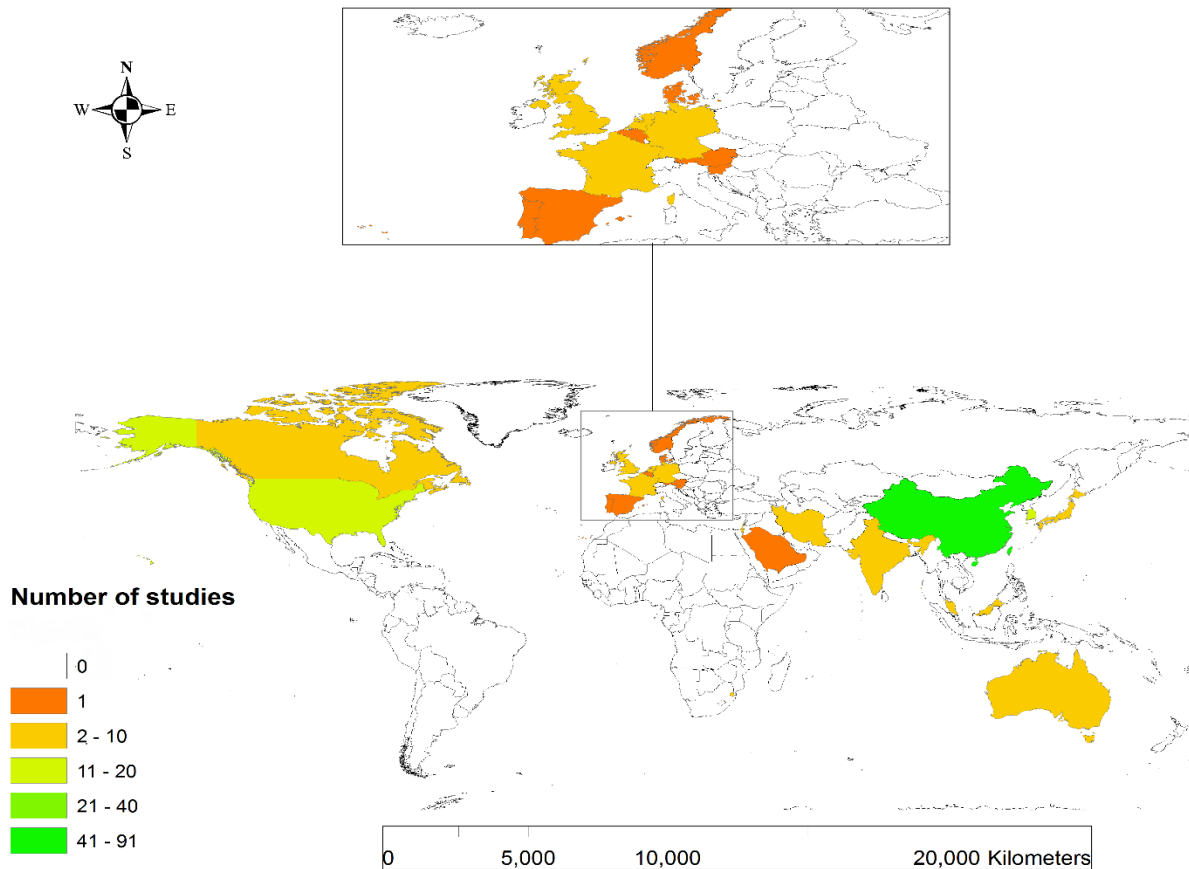
studies included, only five reported no significant association between CAM interventions and outcomes (Table 1).

**Table 1:** Frequency and average related to results, type of study, follow-up period, and sample size of complementary and alternative medicine cohort studies up to the end of 2023

Study design	Number (%)	Average follow-up (months)	Average sample size	Non-significant result
Prospective	75 (34.9)	55.09	28433	3
Retrospective	94 (43.7)	-	12907	1
Retrospective-Prospective	46 (21.4)	39.36	16740	1
Total	215	47.22	19360	5

The majority of cohort studies in the CAM field were carried out in Taiwan (42.33%), with China following closely behind at 21.86%. There were

no studies conducted in Africa or South America (Fig. 4).

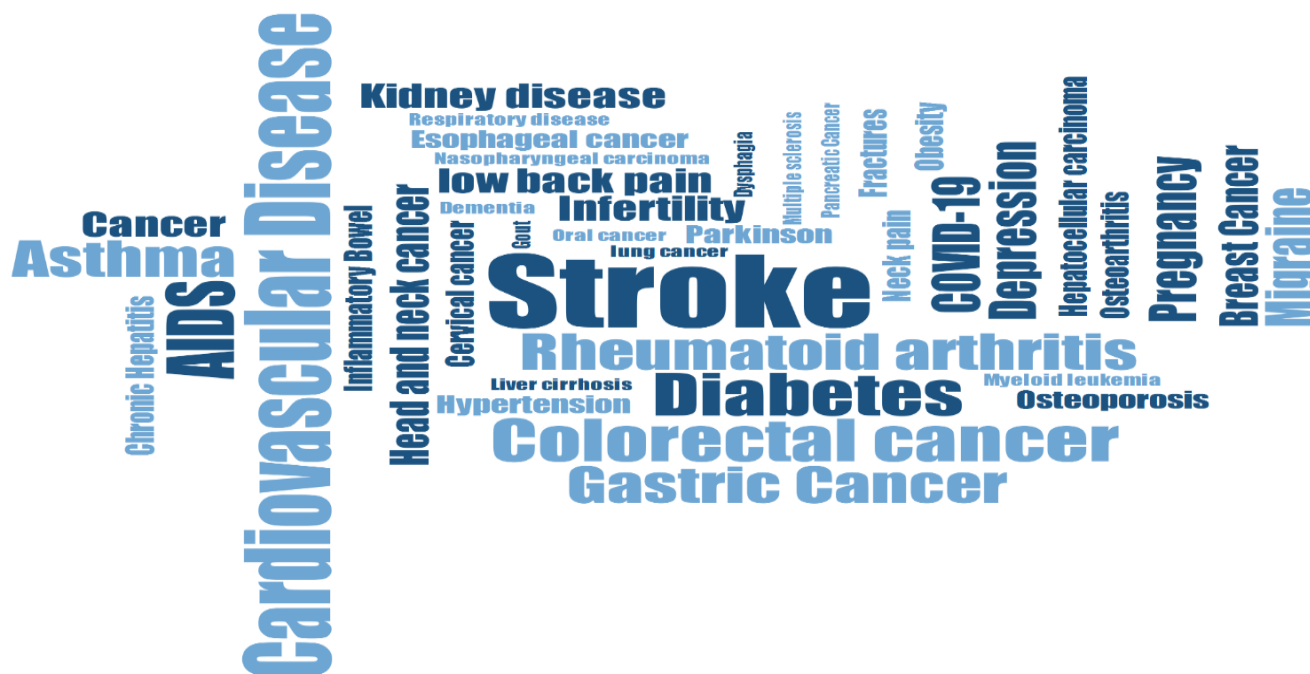


**Fig. 4:** Geographical distribution of complementary and alternative medicine cohort studies up to the end of 2023

**Moran's overall test**

Moran's index correlation (0.004) was close to zero, with a non-significant *P*-value (0.306). This suggests that the distribution of studies follows a random pattern.

The diseases that received the most research attention were stroke (6.05%), cardiovascular diseases (3.72%), diabetes (3.25%), colorectal cancer (2.79%), and AIDS (2.79%) (Fig. 5).



**Fig. 5:** Frequency of diseases studied in complementary and alternative medicine cohort studies up to the end of 2023

The evaluation of the articles was conducted qualitatively using the STROBE checklist. The mean score across all articles was  $1.38 \pm 0.57$  out of two. The introduction section received the highest average STROBE score, while the other information and methods sections scored lower. Missing data, study size, sensitivity analyses, bias, and loss to follow-up all received mean scores below one. Within the methods section, the variable item achieved the highest mean score. Only the "summarize follow-up time" item scored below one in the results and discussion sections. More than 53% of the studies provided sufficient information for the funding item. Item 16c was not applicable to any of the studies, and items 11

and 16b were not applicable to the majority of the studies (Table 2).

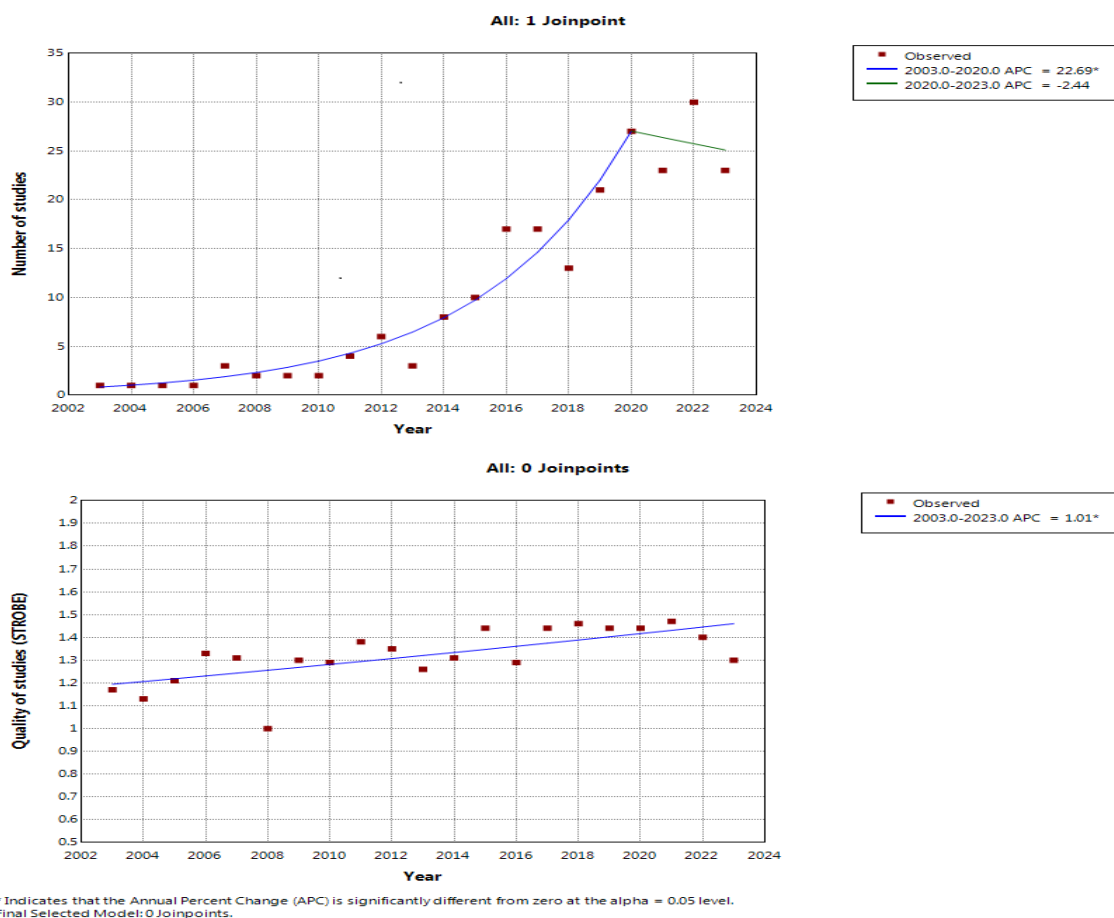
Joint point regression analysis indicated a statistically significant increase in the number of CAM cohort studies from 2003 to 2020 ( $P < 0.05$ ). However, from 2020 to 2023, there has been an insignificant decrease ( $P = 0.733$ ). Additionally, the average annual percent change (AAPC) of 18.5 shows a significant upward trend from 2003 to 2023 ( $P < 0.001$ ). While there is a significant improvement in the quality of CAM cohort studies ( $P < 0.001$ ), it is deemed insufficient (Fig. 6 and Table 3).

**Table 2:** Frequency and mean score of complementary and alternative medicine cohort studies up to the end of 2023 based on the STROBE checklist (The mean score is calculated on a scale of 2)

Number	Item* ( Average $\pm$ SD)	Number of articles Applicable for item Frequency (%)	Not reported item Frequency (%)	Inadequately reported item Frequency (%)	Adequately reported item Frequency (%)	Average $\pm$ SD
Title and abstract (1.75 $\pm$ 0.51)						
1a	Indicate the study's design	215	24 (11.16)	28 (13.02)	163 (75.81)	1.65 $\pm$ 0.67
1b	what was done and what was found	215	0 (0.00)	31 (14.42)	184 (85.58)	1.85 $\pm$ 0.35
Introduction (1.93 $\pm$ 0.26)						
2	Background/rationale	215	0 (0.00)	12 (5.58)	203 (94.42)	1.94 $\pm$ 0.23
3	Objectives	215	2 (.93)	13 (6.05)	200 (93.02)	1.92 $\pm$ 0.30
Method (1.10 $\pm$ 0.54)						
4	Study design	215	0 (0.00)	44 (20.47)	171 (79.53)	1.79 $\pm$ 0.40
5	Setting	215	0 (0.00)	46 (21.40)	169 (78.60)	1.78 $\pm$ 0.41
6a	Participants: Give the eligibility criteria	215	0 (0.00)	40 (18.06)	175 (81.40)	1.81 $\pm$ 0.39
6b	Participants: matched studies	114	3 (2.63)	23 (20.18)	88 (77.19)	1.74 $\pm$ 0.49
7	Variables	215	0 (0.00)	22 (10.23)	193 (89.77)	1.90 $\pm$ 0.30
8	Data sources/ measurement	215	0 (0.00)	23 (5.73)	192 (94.27)	1.89 $\pm$ 0.31
9	Bias	215	111 (51.63)	64 (29.77)	40 (18.60)	0.67 $\pm$ 0.77
10	Study size	215	178 (82.79)	13 (6.05)	24 (11.16)	0.28 $\pm$ 0.65
11	Quantitative variables	28	0 (0.00)	21 (75.00)	7 (25.00)	1.25 $\pm$ 0.44
12a	control of confounding	215	121 (56.28)	69 (32.09)	25 (11.63)	0.55 $\pm$ 0.69
12b	subgroups and interactions	215	134 (62.33)	43 (20.00)	38 (17.67)	0.55 $\pm$ 0.78
12c	missing data	215	166 (77.21)	36 (16.74)	13 (6.05)	0.29 $\pm$ 0.57
12d	Loss to  follow up	133	104 (78.20)	18 (13.53)	11 (8.27)	0.30 $\pm$ 0.61
12e	sensitivity analyses	215	156 (72.56)	25 ( 11.63)	34 (15.81)	0.43 $\pm$ 0.75
Result (1.50 $\pm$ 0.57)						
13a	numbers of individuals	215	3 (1.40)	40 (18.60)	172 (80.00)	1.79 $\pm$ 0.44
13b	reasons for non-participation	215	45 (20.93)	77 (35.81)	93 (43.26)	1.22 $\pm$ 0.77
13c	flow diagram	215	77 (35.81)	2 (0.93)	136 (63.26)	1.27 $\pm$ 0.96
14a	characteristics of study participants	215	0 (0.00)	18 (8.37)	197 (91.63)	1.92 $\pm$ 0.28
14b	number of participants with missing	215	10 (4.65)	58 (26.98)	147 (68.37)	1.64 $\pm$ 0.57
14c	Summarize follow-up time	140	89 (63.57)	33 (23.57)	18 (12.86)	0.49 $\pm$ 0.71
15	Outcome data	215	0 (0.00)	24 (11.16)	191 (88.84)	1.88 $\pm$ 0.32
16a	Give unadjusted estimates	215	8 (3.72)	36 (16.74)	171 (79.53)	1.76 $\pm$ 0.51
16b	Report category boundaries	62	0 (0.00)	35 (56.45)	27 (43.55)	1.44 $\pm$ 0.50
17	Other analyses	18	1 (5.56)	7 (38.89)	10 (55.56)	1.50 $\pm$ 0.62
Discussion (1.60 $\pm$ 0.66)						
18	Key results	215	37 (17.21)	60 (27.91)	118 (54.88)	1.38 $\pm$ 0.76
19	Limitations	215	42 (19.53)	9 (4.19)	164 (76.28)	1.57 $\pm$ 0.80
20	Interpretation	215	2 (0.93)	29 (13.49)	184 (85.58)	1.85 $\pm$ 0.39
21	Generalizability	215	23 (10.70)	42 (19.53)	150 (69.77)	1.59 $\pm$ 0.68
Other information (1.11 $\pm$ 0.97)						
22	Funding	215	9 (41.86)	11 (5.12)	114 (53.02)	1.11 $\pm$ 0.97

\* Items 16c (relative risk into absolute risk), was not applicable to all studies





**Fig. 6:** The trend in the number of complementary and alternative medicine cohort studies along with their quality up to the end of 2023

**Table 3:** Join point analyzes of the number of complementary and alternative medicine cohort studies along with their quality up to the end of 2023

Annual Percent Change (APC)					
		Years	APC	95% CI*	P-value
Number of studies	Segment 1	2003-2020	22.7	20.3-33.8	0.002
	Segment 2	2020-2023	-2.4	-22.3-14.4	0.733
Quality of studies	Segment 1	2003-2023	1.1	0.4-1.6	< 0.001
Average Annual Percent Change (AAPC)					
		Years	AAPC	95% CI	P- Value
Number of studies	Full range	2003-2023	18.5	16.5-24.5	< 0.001
Quality of studies	Full range	2003-2023	1.1	0.4-1.6	< 0.001

\*CI, confidence interval

## Discussion

This study found a significant rise in CAM cohort studies, focusing on stroke and cardiovascu-

lar disease outcomes. Chinese medicine and acupuncture were the primary interventions studied, while other CAM methods received less attention. Most studies were conducted in Taiwan and

China, with no studies from Africa or South America. Evaluation based on STROBE criteria revealed subpar reporting quality on crucial aspects like missing data, study size, sensitivity analyses, bias, and loss to follow-up. Items 11, 16b, and 16c of the STROBE checklist were deemed not applicable for most studies.

Cohort studies offer the ability to test hypotheses that may not be feasible in randomized clinical trials (22). This characteristic has led to the consideration of cohort studies in CAM. Similar to the research conducted by Duan et al. (4), there has been a noticeable increase in the utilization of cohort studies in CAM in recent years. Cohort studies are valuable for tracking patterns and shifts in CAM usage over time (23), which is why they have become a significant tool in CAM research in recent years.

Several studies have highlighted the global use of CAM for treating various diseases over the past decade (24-26). The use of CAM in treating patients with stroke and cardiovascular diseases was significant in this study, as well as in previous research (27-29). Various factors, including the particular condition or illness, the individual's health status, and their current medications, influence patients' readiness to incorporate CAM into their treatment regimen, either as a supplement or alternative (30).

Cohort studies focusing on these conditions can serve as valuable resources for clinical practice and form the basis for future clinical trial investigations. This study similar to other studies (4, 31) shows that using of Chinese medicine is rising. Furthermore, the number of systematic reviews and meta-analyses on acupuncture confirm that using of this intervention is rising (32). Chinese medicine and acupuncture are likely prevalent due to compelling research findings, their potential to complement other treatments, their ability to address various conditions, and minimal adverse effects.

The distribution of cohort studies in the research mirrored the findings of a previous study (4), except for Taiwan having the highest representation and a lack of research conducted in Africa continent and South America. Reasons for using com-

plementary and alternative medicine vary globally (33), along with differences in cultural values and healthcare practices (34), which can impact the utilization of CAM and the approach to related research. Registries are structured data systems that enable the prospective gathering and application of observational and clinical data (35). One possible explanation for the increase in cohort studies in Taiwan and China could be the presence of diverse databases that facilitate the implementation of cohort studies in CAM (36-40). Additionally, the utilization of CAM is significant in these nations; for instance, in Taiwan, the prevalence of CAM treatment recommended or prescribed by both Western medicine practitioners and traditional Chinese medicine practitioners is relatively high (41, 42).

The documentation of CAM usage in Africa is not well-documented, with many CAM users choosing not to disclose their CAM practices to healthcare providers (43). The majority of African countries do not have a registration system for herbal medicines, as highlighted in a WHO report. Additionally, the lack of research data and insufficient financial support for CAM research in the African region and the region of the Americas pose significant challenges to conducting studies in this area (44).

The evaluation of observational studies should be more rigorous compared to clinical trials (45), highlighting the need to report comprehensive details in the method (46). Similar to previous research (47, 48), the quality of reporting in the methods section was a notable concern in this study.

In this section, the reporting quality of key elements such as missing data, study size, sensitivity analyses, bias, and loss to follow-up scored below one. Similar to previous studies (46, 49), missing data was infrequently reported in this study. While the presence of missing data can impact the generalizability of the findings, it is crucial to calculate the sample size to ensure adequate recruitment of participants and detect significant differences (50). However, similar to other research (13, 51), concerns were raised regarding the reporting of sample size calculations in this

study. Sensitivity analyses serve as a measure of the study's robustness against unmeasured confounding variables (52). Yet, akin to other studies (49, 53), the reporting percentage of sensitivity analyses was notably low in this study. Bias has the potential to influence the findings derived from studies (3), underscoring the importance of considering potential sources of bias. However, in this study, as in other studies (47, 54), the reporting of bias was suboptimal.

Similar to the previous study (4), items 11, 16b, and 16c of the STROBE checklist were deemed not applicable for the majority of studies, suggesting that these items may not be suitable for evaluating CAM studies.

## Limitations

This study had some limitations. Firstly, the quality assessment of the articles relied solely on the content provided by the authors without seeking additional information. Secondly, due to a lack of evidence, all checklist items were given equal weight.

## Conclusion

In recent years, there has been a significant increase in the use of cohort studies to assess the impact of CAM interventions. However, the overall quality of reporting in CAM cohort studies is a cause for concern and requires greater transparency. Future studies should focus on enhancing the methodology section and ensuring better adherence to STROBE guidelines during implementation. Failure to improve reporting practices may limit the interpretation and reliability of study results. It is crucial for researchers, health policymakers, and journals to be familiar with and adhere to the STROBE checklist recommendations. Additionally, providing training in statistical methods for researchers and developing a STROBE extension specifically for CAM cohort studies should be considered.

## Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Data availability

Data related to this article can be obtained from the corresponding author on request.

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## Conflict of interest

There is no conflict of interest between the authors.

## References

1. Blonde L, Khunti K, Harris SB, et al (2018). Interpretation and Impact of Real-World Clinical Data for the Practicing Clinician. *Adv Ther*, 35(11):1763-74.
2. Capili B, Anastasi JK (2021). Cohort Studies. *Am J Nurs*, 121(12):45-8.
3. Metelli S, Chaimani A (2020). Challenges in meta-analyses with observational studies. *Evid Based Ment Health*, 23(2):83-7.
4. Duan Y, Xu Z, Deng J, et al (2020). A scoping review of cohort studies assessing traditional Chinese medicine interventions. *BMC Complement Med Ther*, 20(1):361.

5. Hosseini A, Jackson A, Bahramnezhad F (2022). Ethical considerations in interventional studies: A systematic review. *Acta Med Iran*, 60(10):609-14.
6. Saldanha IJ, Adam GP, Bañez LL, et al (2022). Inclusion of nonrandomized studies of interventions in systematic reviews of interventions: updated guidance from the Agency for Health Care Research and Quality Effective Health Care program. *J Clin Epidemiol*, 152(8):300-306.
7. Tong Z, He W, Yutong F (2019). Bias control of interventional cohort study and the particularity in the field of traditional Chinese medicine. *J Tradit Chin Med*, 60(11):923-7.
8. Jung H, Won T, Kim G-Y, et al (2023). Efficacy of acupuncture on cardiovascular complications in patients with diabetes mellitus in Korea: A nationwide retrospective cohort. *J Integr Med*, 21(2):176-83.
9. Chen S-L, Ho C-Y, Lin W-C, et al (2022). The characteristics and mortality of Chinese herbal medicine users among newly diagnosed inoperable huge hepatocellular carcinoma ( $\geq 10$  cm) patients: A retrospective cohort study with exploration of core herbs. *Int J Environ Res Public Health*, 19(19):12480.
10. Chang C-J, Yang Y-H, Chen P-C, et al (2019). Stomach cancer and exposure to talc powder without asbestos via Chinese herbal medicine: a population-based cohort study. *Int J Environ Res Public Health*, 16(5):717.
11. Kong Y-C, Kimman M, Subramaniam S, et al (2022). Out-of-pocket payments for complementary medicine following cancer and the effect on financial outcomes in middle-income countries in southeast Asia: a prospective cohort study. *Lancet Glob Health*, 10(3):e416-e28.
12. Teut M, Walach H, Varanasi R, et al (2020). Recommendations for Designing, Conducting and Reporting Observational Studies in Homeopathy. *Homeopathy*, 109(3):114-25.
13. Rahmani N, Salehi A, Molavi Vardanjani H, et al (2020). Using STROBE checklist to assess the reporting quality of observational studies affiliated with Shiraz University of Medical Sciences, and its correlates: a scientometric study from Iran. *Scientometrics*, 122:989-1001.
14. Yordanov Y, Dechartres A, Atal I, et al (2018). Avoidable waste of research related to outcome planning and reporting in clinical trials. *BMC Med*, 16(1):87.
15. Vandembroucke JP, von Elm E, Altman DG, et al (2007). Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *Ann Intern Med*, 147(8):W163-94.
16. Sharp MK, Utrobičić A, Gómez G, et al (2017). The STROBE extensions: protocol for a qualitative assessment of content and a survey of endorsement. *BMJ Open*, 7(10):e019043.
17. Sharp MK, Tokalić R, Gómez G, et al (2019). A cross-sectional bibliometric study showed suboptimal journal endorsement rates of STROBE and its extensions. *J Clin Epidemiol*, 107:42-50.
18. Peters MDJ, Marnie C, Colquhoun H, et al (2021). Scoping reviews: reinforcing and advancing the methodology and application. *Syst Rev*, 10(1):263.
19. Munn Z, Peters MDJ, Stern C, et al (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol*, 18(1):143.
20. Mak S, Thomas A (2022). An Introduction to Scoping Reviews. *J Grad Med Educ*, 14(5):561-4.
21. Choi SY, Choi SY (2020). Evaluation of the Quality of Case Reports from the Journal of Korean Medicine Based on the CARE guidelines. *J Korean Med*, 41(2):122-36.
22. Andrade C (2022). Research Design: Cohort Studies. *Indian J Psychol Med*, 44(2):189-91.
23. Canizares M, Hogg-Johnson S, Gignac MAM, et al (2017). Changes in the use practitioner-based complementary and alternative medicine over time in Canada: Cohort and period effects. *PLoS One*, 12(5):e0177307.
24. Yang J, Lim KH, Lim KT, et al (2023). Complementary and alternative medicine for long COVID: a systematic review of randomized controlled trials. *Ther Adv Chronic Dis*, 14:20406223231204727.
25. Jiang Y, Zheng RX, Yu ZY, et al (2022). Traditional Chinese Medicine for HIV-Associated Acute Herpes Zoster: A Systematic Review and Meta-Analysis of

- Randomized Trials. *Evid Based Complement Alternat Med*, 2022:8674648.
26. Behzadmehr R, Dastyar N, Moghadam MP, et al (2020). Effect of complementary and alternative medicine interventions on cancer related pain among breast cancer patients: A systematic review. *Complement Ther Med*, 49:102318.
  27. Rajahthurai SD, Farrukh MJ, Makmor-Bakry M, et al (2022). Use of complementary and alternative medicine and adherence to medication therapy among stroke patients: a meta-analysis and systematic review. *Front Pharmacol*, 13:870641.
  28. Shaito A, Thuan DTB, Phu HT, et al (2020). Herbal Medicine for Cardiovascular Diseases: Efficacy, Mechanisms, and Safety. *Front Pharmacol*, 11:422.
  29. Lai Y-T, Lin C-H, Hsieh CC, et al (2022). Combining yoga exercise with rehabilitation improves balance and depression in patients with chronic stroke: A controlled trial. *App Sci*, 12(2):922.
  30. Mortada EM (2024). Evidence-Based Complementary and Alternative Medicine in Current Medical Practice. *Cureus*, 16(1):e52041.
  31. Duan Y, Xu Z, Lin Y, et al (2021). A Scoping Review of Cross-Sectional Studies on Traditional Chinese Medicine. *Am J Chin Med*, 49(6):1275-96.
  32. Zhang Y, Zhang Y, Liu S, et al (2023). Acupuncture for cancer pain: a scoping review of systematic reviews and meta-analyses. *Front Oncol*, 13:1169458.
  33. Tangkiatcumjai M, Boardman H, Walker DM (2020). Potential factors that influence usage of complementary and alternative medicine worldwide: a systematic review. *BMC Complement Med Ther*, 20(1):363.
  34. Jasamai M, Islahudin F, Samsuddin NF (2017). Attitudes towards complementary alternative medicine among Malaysian adults. *J Appl Pharm Sci*, 7(6):190-3.
  35. Rubinger L, Ekhtiari S, Gazendam A, et al (2023). Registries: Big data, bigger problems? *Injury*, 54 Suppl 3:S39-S42.
  36. Huang CH, Lin SK, Lin MC, et al (2023). Acupuncture is associated with reduced dementia risk in patients with insomnia: A propensity-score-matched cohort study of real-world data. *J Tradit Complement Med*, 13(3):297-305.
  37. Liao CC, Chien CH, Shih YH, et al (2023). Acupuncture Is Effective at Reducing the Risk of Stroke in Patients with Migraines: A Real-World, Large-Scale Cohort Study with 19-Years of Follow-Up. *Int J Environ Res Public Health*, 20(3):1690.
  38. Huang CY, Wu MY, Huang MC, et al (2023). The association between acupuncture therapy and the risk of reduced pressure ulcers in dementia patients: A retrospective matched cohort study. *Integr Med Res*, 12(3):100981.
  39. Wang W, Wang YH, Yang K, et al (2023). Traditional Chinese medicine use is associated with lower risk of pneumonia in patients with systemic lupus erythematosus: a population-based retrospective cohort study. *Front Pharmacol*, 14:1185809.
  40. Fang Y, Liu J, Xin L, et al (2023). Traditional Chinese Medicine Compound Preparations Are Associated with Low Disease-Related Complication Rates in Patients with Rheumatoid Arthritis: A Retrospective Cohort Study of 11,074 Patients. *Biomed Res Int*, 2023:1019290.
  41. Huang CW, Tran DNH, Li TF, et al (2019). The utilization of complementary and alternative medicine in Taiwan: An internet survey using an adapted version of the international questionnaire (I-CAM-Q). *J Chin Med Assoc*, 82(8):665-71.
  42. Lee EL, Richards N, Harrison J, et al (2022). Prevalence of Use of Traditional, Complementary and Alternative Medicine by the General Population: A Systematic Review of National Studies Published from 2010 to 2019. *Drug Saf*, 45(7):713-35.
  43. James PB, Wardle J, Steel A, et al (2018). Traditional, complementary and alternative medicine use in Sub-Saharan Africa: a systematic review. *BMJ Glob Health*, 3(5):e000895.
  44. Ghebreyesus T A, Kelley E, Qi Z, et al (2019). *WHO global report on traditional and complementary medicine 2019*. Geneva, pp.: 40-41
  45. Bero L, Chartres N, Diong J, Fabbri A, et al (2018). The risk of bias in observational studies of exposures (ROBINS-E) tool: concerns arising from application to

- observational studies of exposures. *Syst Rev*, 7(1):242.
46. Dai S, Zhou X, Xu H, et al (2020). Evaluation of the reporting quality of observational studies in master of public health dissertations in China. *BMC Med Res Methodol*, 20(1):230.
47. Wiehn E, Ricci C, Alvarez-Perea A, et al (2021). Adherence to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist in articles published in EAACI Journals: A bibliographic study. *Allergy*, 76(12):3581-8.
48. Norouzi M, Haghdoost AA, Setayesh M (2024). Quality Assessment of Traditional Persian Medicine Observational Studies. *Iran J Public Health*, 53(7):1469-1481.
49. Shaghaghian S, Astaneh B (2020). Adherence to the strengthening the reporting of observational studies in epidemiology statement in observational studies published in Iranian medical journals. *Iran J Public Health*, 49(8):1520-29.
50. Rodríguez Del Águila M, González-Ramírez A (2014). Sample size calculation. *Allergol Immunopatbol (Madr)*, 42(5):485-92.
51. Nagarajan VB, Bhide S, Kanase HR, et al (2018). Adherence of Observational Studies Published in Indian Journals to STROBE Statement. *J Assoc Physicians India*, 66(12):39-42.
52. Bonvini M, Kennedy EH (2022). Sensitivity analysis via the proportion of unmeasured confounding. *J Am Stat Assoc*, 117(539):1540-50.
53. Hendriksma M, Joosten MH, Peters JP, et al (2017). Evaluation of the Quality of Reporting of Observational Studies in Otorhinolaryngology - Based on the STROBE Statement. *PLoS One*, 12(1):e0169316.
54. Irani M, Bashtian MH, Khadivzadeh T, et al (2018). Weaknesses in the reporting of cross-sectional studies in accordance with the STROBE report (the case of congenital anomaly among infants in Iran): a review article. *Iran J Public Health*, 47(12):1796-1804.