PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Modeling of Physicians' Clinical Information-Seeking Behavior in Iran: A Grounded Theory Study
AUTHORS	Daei, Azra; Soleymani, Mohammadreza; Zargham-Boroujeni, Ali; Kelishadi, Roya; Ashrafi-rizi, Hasan

VERSION 1 – REVIEW

REVIEWER	Mohamed Kassim University of Dar es Salaam
REVIEW RETURNED	20-Nov-2023

GENERAL COMMENTS	There are minor issues to be addressed as follows: 1. There are issues with citations particularly on the use of brackets as most of them have been wrongly used, thus making the information unclear. A thorough proofread of the manuscript will help address this problem. 2. In building their case, the authors are arguing that several studies have focused on analyzing information needs, used resources, and the numbers of extracted questions, barriers, and the facilitators of CISB among physicians and that they are silent about activities, determinants, and specific decisions. The authors are also arguing that CISB process was not deeply investigated among physicians. I think the authors need to move a step further explaining what is wrong if the available studies are silent about the activities, determinant, and specific decisions, and also why there is a need to deeply study the CISB process among the physicians. Doing that will also help provide justification for their study. 3. The study's objective(s) is/are missing in the paper. These need to be spelled out clear to see really what the study wants to address.

REVIEWER	Susan Oudbier Amsterdam UMC Locatie VUmc
REVIEW RETURNED	23-Jan-2024

GENERAL COMMENTS	Dear authors, Thank you for submitting your review to BMJ open. I enjoyed reading the study. However, there are some tips for further improvement and clarification, in particular to your research design/methods. In general - Something went wrong with your references.)((see e.g. page 4/31)

	- The level of English that has been used in this article is sometimes not suffient. For instance – In open coding…? In the open coding process. Another example: gratis information resources – free? Information resources. - The writing in your paper is not consistent. You interchange English tenses, which makes it for the reader hard to follow your line of thought. - Try to be as consistent as possible with your concepts/terms. Sometimes you use participants, sometimes physicians – for instance: Participants believed that public awareness and social pressures could affect physicians' interests, judgments, and information-seeking decision. I had to read this sentence twice to notice that this is an expression about themselves. Abstract - The first sentence of your abstract is hard to read. This makes it difficult for the reader to be able to get into the research. - I like the title of your research and research question. My tip is try to rewrite the sentences and make Introduction - It constitutes a literature summary from the field, yet fails to establish the connection regarding its relevance to this particular study. - Try to give the reader more insight into why this research is relevant and has to be conducted. Typically, the introduction follows a funnel model, starting broadly and gradually narrowing down. Methods - I miss a referral to your interview guide. I cannot find it in the appendix either. - The interview guide was expanded using discussing with team members. Are your team members experts in qualitative research? - The researchers used several software packages for analysis. This raises questions; why did you use two programmes for your analysis? What kind of packages within MAXQDA did you use? - In open coding, three researchers independently reviewed the three texts. It is unclear which three texts you are referring to. - The disagreements were reviewed with other investigators – researchers? Why did you use other team members to do this? - The trusthworthiness in Lincoln and Guba were set – these are credibility, transferability, dependability, and confirmability. Please clarify what you did in order to meet this. Results It is really hard to follow the line of reasoning through your results. Here are some examples: - Information evaluation repeat in this stage due to the weight of the issue for the patient and the potential legal complications for the physician – Can you provide more details? Do you mean implications? - Indeed, the physician is responsible for all care-related consequences. o What do you mean? Physicians often work in multidisciplinary teams. Why are they responsible for ALL care-related consequences? Discussion & conclusion - What I appreciate about the discussion is the manner in which you

	correlate the subthemes derived from the analysis with relevant studies conducted in the field - However, the coherence of your conclusion is lacking. I find it challenging to comprehend the rationale or final conclusion. Appendix – table 1 - Your level of detail is high for the twenty-one participants you included in this study. 45.52 years? 13.14 years of experience? - Age, mean (SD), y (y=years?) Please clarify your tables. - I cannot find the COREQ checklist you have applied in the Appendix

VERSION 1 – AUTHOR RESPONSE

Reviewers' comments:
Referee #1: Dr. Mohamed Kassim, University of Dar es Salaam
There are minor issues to be addressed as follows:

1. There are issues with citations particularly on the use of brackets as most of them have been wrongly used, thus making the information unclear. A thorough proofread of the manuscript will help address this problem.
Answer: We thank the referee very much for his valuable comments. The problem was due to confusion in the endnote style. According to the referee's comments, we revised and change it to bmj style.

2. In building their case, the authors are arguing that several studies have focused on analyzing information needs, used resources, and the numbers of extracted questions, barriers, and the facilitators of CISB among physicians and that they are silent about activities, determinants, and specific decisions. The authors are also arguing that CISB process was not deeply investigated among physicians. I think the authors need to move a step further explaining what is wrong if the available studies are silent about the activities, determinant, and specific decisions, and also why there is a need to deeply study the CISB process among the physicians. Doing that will also help provide justification for their study.
Answer: We thank the referee for these valuable and thought-provoking remarks. According to comments the manuscript corrected as follow (Page 4, line 19):
“However, the existing literature highlights a lack of comprehensive investigation into the CISB and only a few studies have delved into determinants, and CISB processes. This gap in the existing research could lead to an incomplete understanding of the CISB process, which could ultimately result in less effective medical tools. If we do not know how physicians search for information, we can’t optimize decision support systems to respond to their information needs. To address these deficiencies and improve the CISB process, we need a deeper understanding of its theoretical foundations include the activities, determinants, and decision-making processes involved in CISB. This understanding could help better comprehend to enhance medical systems to meet physicians’ information needs and ultimately contribute to providing better care for patients.
On the other hand, considering that ISB is heavily influenced by context and impacting factors, therefore, the CISB of physicians needs to be deeply studied in all aspects. Given that grounded theory, by delving into the phenomenon, seeks to discover existing interactions and social processes beyond describing what is said and observed in phenomena and focuses on processing and presenting theory, it can help identify dimensions, conditions, interactions, processes, and motivations of the process.”

3. The study's objective(s) is/are missing in the paper. These need to be spelled out clear to see really what the study wants to address.
Answer: According to comments the manuscript corrected as follow (Page 5, line 10):
"Therefore, the current study aimed to explore the dimensions, interactions, strategies, and determinants of CISB among physicians in the clinical setting. To achieve this objective, the following sub-goals were addressed:
1. Identifying the causal conditions affecting the CISB of physicians;
2. Identifying the contextual conditions affecting the CISB of physicians;
3. Identifying the intervening conditions affecting the CISB of physicians;
4. Identifying the action/interaction strategies adopted by physicians in CISB;
5. Identifying the consequences that originated after the CISB of physicians."

Referee #2: Dr. Susan Oudbier, Amsterdam UMC Locatie VUmc

Thank you for submitting your review to BMJ open. I enjoyed reading the study. However, there are some tips for further improvement and clarification, in particular to your research design/methods.
In general
- Something went wrong with your references.)((see e.g. page 4/31)
Answer: We thank the referee very much for her valuable comments. The problem was due to confusion in the endnote style. According to the referee's comments, we revised and change it to bmj style.

- The level of English that has been used in this article is sometimes not suffient. For instance – In open coding…? In the open coding process. Another example: gratis information resources – free? Information resources. The writing in your paper is not consistent. You interchange English tenses, which makes it for the reader hard to follow your line of thought.
Answer: We thank the referee very much for pointing out the editorial problems. According to the referee's comments, a native English expert edited the whole manuscript for proper English style, grammar, punctuation, and spelling; the certificate of online English editing service is provided for the journal.

- Try to be as consistent as possible with your concepts/terms. Sometimes you use participants, sometimes physicians – for instance: Participants believed that public awareness and social pressures could affect physicians' interests, judgments, and information-seeking decision. I had to read this sentence twice to notice that this is an expression about themselves.
Answer: According to comments the manuscript corrected. We use physicians instead of participants in the results to avoid of ambiguity. Changes highlighted the in the text.

Abstract
- The first sentence of your abstract is hard to read. This makes it difficult for the reader to be able to get into the research.
Answer: According to comments the manuscript corrected as follow (Page 2, line 2):
"Objectives: Exploring Clinical Information-seeking Behavior (CISB) and its associated factors contributes to its theoretical advancement and offers a valuable framework for addressing physicians' information needs."

- I like the title of your research and research question

Answer: We thank the referee very much for valuable and thoughtful comments.

Introduction

- It constitutes a literature summary from the field, yet fails to establish the connection regarding its relevance to this particular study. Try to give the reader more insight into why this research is relevant and has to be conducted. Typically, the introduction follows a funnel model, starting broadly and gradually narrowing down.

Answer: According to comments the manuscript corrected as follow (Page 4, line 19) and (Page 5, line 11):

"However, the existing literature highlights a lack of comprehensive investigation into the CISB and only a few studies have delved into determinants, and CISB processes. This gap in the existing research could lead to an incomplete understanding of the CISB process, which could ultimately result in less effective medical tools. If we do not know how physicians search for information, we can't optimize decision support systems to respond to their information needs. To address these deficiencies and improve the CISB process, we need a deeper understanding of its theoretical foundations include the activities, determinants, and decision-making processes involved in CISB. This understanding could help better comprehend to enhance medical systems to meet physicians' information needs and ultimately contribute to providing better care for patients.

On the other hand, considering that ISB is heavily influenced by context and impacting factors, therefore, the CISB of physicians needs to be deeply studied in all aspects. Given that grounded theory, by delving into the phenomenon, seeks to discover existing interactions and social processes beyond describing what is said and observed in phenomena and focuses on processing and presenting theory, it can help identify dimensions, conditions, interactions, processes, and motivations of the process."

"To achieve this objective, the following sub-goals were addressed:

1. Identifying the causal conditions affecting the CISB of physicians;
2. Identifying the contextual conditions affecting the CISB of physicians;
3. Identifying the intervening conditions affecting the CISB of physicians;
4. Identifying the action/interaction strategies adopted by physicians in CISB;
5. Identifying the consequences that originated after the CISB of physicians."

Methods

- I miss a referral to your interview guide. I cannot find it in the appendix either.

Answer: We added the interview guide in supplement 1.

- The interview guide was expanded using discussing with team members. Are your team members experts in qualitative research?

Answer: Our team members are expert in qualitative research. They are university lecturers and professors teaching "research methodology" courses at the MA and PHD. Additionally, they have conducted research studies using qualitative approaches.

According to comments the manuscript corrected as follow (Page 7, line 23):

"the research team (that are experts in the qualitative researches)"

- The researchers used several software packages for analysis. This raises questions; why did you use two programmes for your analysis? What kind of packages within MAXQDA did you use?

Answer: There was a mistake. According to comments the manuscript corrected as follow (Page 7, line 10):

"including Microsoft Word and MAXQDA V.10."

- In open coding, three researchers independently reviewed the three texts. It is unclear which three texts you are referring to.
Answer: According to comments the manuscript corrected as follow (Page 7, line 12):
“(participant specialty, year of experience: emergency medicine, 8; ENT, 27; general surgery, 7)”

- The disagreements were reviewed with other investigators – researchers? Why did you use other team members to do this?
Answer: The research team members, due to their involvement in the research process, are the best individuals for accurately understanding and identifying the concepts derived from the interviews; this is because they not only have sufficient knowledge of the subject but also have a greater presence in the field and research environment, thereby increasing the likelihood of a more precise comprehension of the concepts compared to individuals outside the research team.
Also, due to the limitation in the number of words, we removed many of the things we did during coding, but we added them to the text again to prevent lack of transparency.
According to comments the manuscript corrected as follow (Page 7, line 15):
“Also, the text of several interviews, codes, and extracted categories were made available to a number of experts in the qualitative research who did not participate in the study, to review and ensure that the initial codes were derived from the interview content and not the interpretations or preconceptions of the researchers. Furthermore, the extracted categories and concepts from the interviews were also shared with some of the participants to ensure that their intended meaning is reflected in the results.”

- The trustworthiness in Lincoln and Guba were set – these are credibility, transferability, dependability, and confirmability. Please clarify what you did in order to meet this.
Answer: According to comments the manuscript corrected as follow (Page 8, line 6) and (Page 7, line 15):

“The researchers ensured trustworthiness by engaging in detailed transcription and description of methods, systematic planning and coding following Lincoln and Guba guidelines 32,33.”

“Also, the text of several interviews, codes, and extracted categories were made available to a number of experts in the qualitative research who did not participate in the study, to review and ensure that the initial codes were derived from the interview content and not the interpretations or preconceptions of the researchers. Furthermore, the extracted categories and concepts from the interviews were also shared with some of the participants to ensure that their intended meaning is reflected in the results.”
As follow, these are what we did to meet trustworthiness (credibility, transferability, dependability, and confirmability). Due to the limitation in the number of words, we removed many of them. If the added items above do not attract the referee’s opinion, we can also add these items:
Credibility: long contact with the research environment, persistent observation, examination from various angles, peer consultation, and member checks were employed. In the current study, the researcher had a continuous and consistent presence in the clinical setting for data collection and to observe the information-seeking behavior of physicians; this included ongoing presence in clinics, faculty rooms, inpatient wards, morning reports, journal clubs, specialty clinics, and multiple visits to operating rooms across various centers.
Additionally, the participant review method was used to validate the accuracy of the data and the extracted codes. The authenticity and correctness of the transcribed interview texts were confirmed by the researcher with the interviewees. The coded interview texts were sent to the participants (3

specialists and 2 subspecialists) to comment on the alignment of the extracted codes and the researcher's initial interpretations with their own experiences.
Transferability: Transparent presentation of information related to the research environment and its prevailing atmosphere is provided, so that another researcher can make an informed decision about whether the research results can be applied to their own community of interest or not. In the current study, the research findings were presented to individuals who did not participate in the study to judge the similarity between the research results and their own experiences. The results were sent to 2 specialists (in emergency medicine and internal medicine), one subspecialist (in pediatric nephrology), and 3 experts in the field of medical librarianship.
Dependability: The details of how data were collected, and the decision-making processes, interpretations, and analyses conducted during the research should be reviewed and inspected by someone outside of the research. In this study, all stages and processes of the research were meticulously recorded and reported from beginning to end, with details of data analysis provided. Excerpts from the interview texts were made available for each code to enable auditing and evaluation of the study by an external observer, allowing them to reach the same conclusions as the researcher through a thorough review of the data and the researcher's decision-making process.
Confirmability: It means whether the data and findings are confirmable by others. In the current study, to ensure confirmability, efforts were made to report the research steps in full detail. Additionally, the text of several interviews, codes, and extracted categories were made available to three team members and several experts in the qualitative research (2 PhD in medical library and information science, 2 medical specialists, and 1 PhD in nursing) \and did not participate in the study, to review and ensure that the data and findings were derived from the interview texts and not the interpretations and mental preconceptions of the researcher. Furthermore, the extracted categories and concepts from the interviews were also shared with some of the participants to ensure that their intended meaning is reflected in the results.

Results
It is really hard to follow the line of reasoning through your results. Here are some examples:
- Information evaluation repeat in this stage due to the weight of the issue for the patient and the potential legal complications for the physician – Can you provide more details? Do you mean implications? Indeed, the physician is responsible for all care-related consequences. o What do you mean? Physicians often work in multidisciplinary teams. Why are they responsible for ALL care-related consequences?
Answer: We believe that part of this ambiguity may have been due to translation and grammar issues. We hope that by revising the article in a native manner, this problem has been resolved.

For more details: "Not involving the physician in legal disputes" was one of our most important concepts in this research that had not been addressed in previous studies. It may be related to the context and society in which we live, and physicians strongly emphasized it.
After the physicians has assessed the ability to perform the care method in terms of organization, cost-effectiveness, patient's value and financial preferences, they re-evaluate the method or solution in terms of not creating a legal problem for them. When the physicians face a lack of appropriate information regarding patient care and actively seeks information that clearly reduces medical errors. In legal implications in their practice, physicians must be able to defend their method in case of a complaint. In general, even if the source is credible, they choose information for prescription that does not create a legal problem for themselves. physicians believe that when only one article is obtained in the information search process, the care method of that source cannot be used because it is not defensible in case of a problem and error. Therefore, low-credibility sources, in addition to potentially harming the patient care process, can also create legal problems for the doctor himself/herself. Therefore, not creating a legal problem for the physicians is one of the influential factors in physicians' CISB.

Discussion & conclusion
- What I appreciate about the discussion is the manner in which you correlate the subthemes derived from the analysis with relevant studies conducted in the field
Answer: We truly appreciate the reviewer's comments, and we recognize that it would improve the revised version of the manuscript.

- However, the coherence of your conclusion is lacking. I find it challenging to comprehend the rationale or final conclusion.
Answer: According to comments the manuscript corrected as follow (Page 20, line 14):
"The information-seeking process commences with the identification of an information need and is directed towards resolving clinical issues. The CISB process follows an IF-THEN sequence when addressing clinical problems. In the presence of stimuli such as information needs and suitable characteristics of the clinical question, and under facilitating contextual and intervening conditions, physicians are directed towards professional and organizational growth. Additionally, they enhance patient satisfaction by adopting information-seeking strategies and focusing on resolving clinical issues. Conversely, if the necessary stimuli are insufficient, physicians are directed towards a failure to seek information. Consequently, the rhythm of the physician's CISB process aligns with variations in the characteristics of the clinical problem and contextual conditions, encompassing individual, organizational, technical, social, and resource usability factors."

Appendix –
table 1
- Your level of detail is high for the twenty-one participants you included in this study. 45.52 years? 13.14 years of experience?
- Age, mean (SD), y (y=years?) Please clarify your tables.
Answer: According to comments the manuscript corrected as follow (Page 27, line 1):

Characteristics Participants in Interviews
Age (years), mean ± SD 45.52 ± 6.8
Experience (years), mean ± SD 13.14 ± 7.6

- I cannot find the COREQ checklist you have applied in the Appendix
Answer: We added the COREQ checklist in supplement 2.