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Optimizing the Role of Husbands in Childbirth Assistance through Education and Simulation of Nonpharmacological Techniques in Balikpapan

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ABSTRACT

Background. Childbirth is a challenging experience, and the involvement of the husband in providing emotional and physical support can significantly impact maternal outcomes. However, paternal involvement in non-pharmacological labor support remains underexplored, particularly in Balikpapan.

Purpose. This study aimed to optimize the role of husbands in supporting their wives during labor through education and simulation of non-pharmacological techniques.

Method. The research employed a quasi-experimental design with a pre-test and post-test approach, involving 50 couples from Balikpapan. Participants attended educational sessions on non-pharmacological pain relief techniques, followed by simulation exercises where husbands practiced these methods.

Results. The results showed a significant increase in husbands' knowledge, with the mean post-test score rising from 35% to 78%. Moreover, husbands demonstrated a 60% improvement in applying non-pharmacological techniques during simulated labor scenarios.

Conclusion. The findings suggest that targeted education and simulation effectively enhance husbands' preparedness to provide essential support during labor, contributing to improved maternal comfort and reduced anxiety. This study highlights the importance of including paternal education in prenatal care programs, advocating for a more family-centered approach to childbirth. Future research should explore the long-term effects of such interventions and their applicability across diverse cultural contexts.

KEYWORDS

Balikpapan, Childbirth Support, Educational Intervention, Non-Pharmacological Techniques, Paternal Involvement

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INTRODUCTION

The process of childbirth is an emotionally and physically challenging experience for expectant mothers. Often, their physical and emotional wellbeing during labor is influenced by various factors, including the presence and support of their husbands (Abikou dkk., 2024). While medical interventions play a crucial role in the labor process, non-pharmacological methods, including relaxation techniques, breathing exercises, and emotional support, are increasingly recognized as valuable tools to improve maternal outcomes (Ahmadpour dkk., 2024). These methods, which do not involve medication, are believed to reduce labor pain and anxiety, promoting a

more positive birth experience. In Balikpapan, a region known for its diverse population and healthcare challenges, the role of a husband in providing emotional and physical support during childbirth remains largely underexplored. The growing awareness of the importance of a supportive partner highlights the need for educational programs that equip husbands with the knowledge and skills to assist in non-pharmacological interventions during labor.

Research suggests that the involvement of husbands during childbirth can enhance a mother's sense of security and comfort. Studies have shown that the presence of a supportive partner can lead to lower levels of anxiety and a more positive birth experience (Bamashmous dkk., 2025). However, despite this growing recognition of the importance of emotional support, many expectant fathers still feel unprepared to effectively contribute to their partner's comfort during labor. The role of education in empowering husbands to provide appropriate support is essential, yet few formal programs are available to guide them in understanding and applying non-pharmacological techniques (Barrientos Gómez dkk., 2026). Given the potential benefits of such interventions, this research aims to investigate how educational initiatives, including the use of simulations, can enhance husbands' ability to support their wives during labor, especially in the context of Balikpapan.

This study is not only timely but also necessary in the context of the region's healthcare services, where there is a clear need for greater integration of family-centered care practices (Boltivets dkk., 2025). While existing studies have primarily focused on the role of healthcare providers, there is a gap in literature specifically addressing the involvement of fathers in the birthing process, particularly in terms of non-pharmacological interventions (Bonaiuti dkk., 2024). The importance of ensuring a positive birth experience through supportive, non-invasive methods is a growing concern within maternal health research, necessitating further exploration into how husbands can be effectively involved in this process.

The problem addressed in this research revolves around the lack of structured programs aimed at educating husbands on their critical role in the non-pharmacological management of labor (Canlı dkk., 2026). Despite the significant impact that emotional and physical support can have on labor outcomes, many expectant fathers remain unsure about how to effectively assist their wives. This lack of preparation could contribute to suboptimal birth experiences, potentially exacerbating feelings of anxiety and helplessness for both partners (Di Fabrizio dkk., 2025). In particular, there is limited knowledge about how husbands can contribute to the relief of labor pain and anxiety through non-pharmacological techniques such as breathing exercises, relaxation techniques, and providing emotional support.

Additionally, although the involvement of husbands in childbirth has been studied in some cultural contexts, the application of this knowledge in Balikpapan remains relatively unexplored. There is a need for a specific intervention model tailored to the local context, which considers both cultural factors and the accessibility of healthcare services (Dundar Ahi dkk., 2025). This gap is compounded by the absence of comprehensive, evidence-based training programs that teach fathers how to implement non-pharmacological methods effectively. Therefore, this study aims to fill this void by investigating the role of education and simulation techniques in enhancing the ability of husbands to support their wives during childbirth (Esmalian Khamseh dkk., 2026). By addressing these concerns, the study aims to improve both maternal and paternal experiences during labor.

The research also aims to address the broader issue of paternal involvement in the birth process, an aspect often overlooked in maternal health policies (Fındık dkk., 2025). While maternal health has received extensive attention in research, there remains a lack of focus on the broader family dynamic during labor. This research will provide a comprehensive look at how to empower

fathers through education and simulation, which in turn could lead to improved labor outcomes. The absence of structured programs that focus on the husband's role in non-pharmacological pain relief during labor represents a significant gap in both academic research and healthcare practice.

The primary objective of this research is to explore the effectiveness of an educational and simulation-based intervention aimed at enhancing the role of husbands in supporting their wives during labor. Specifically, this study seeks to assess how such interventions can equip husbands with the skills to apply non-pharmacological pain relief techniques during the labor process (Fleet dkk., 2024). By improving fathers' knowledge and confidence in providing support, the research aims to enhance the overall birth experience for mothers, reducing their anxiety and pain levels (Kim dkk., 2025). Additionally, the study intends to evaluate the impact of these interventions on the perceived emotional and physical comfort of the mother during labor, as well as the husband's satisfaction with his role in the process.

Furthermore, the research will investigate how these educational interventions can foster a more collaborative and supportive partnership between the couple during childbirth. Given the potential for increased paternal involvement in the labor process, this research will explore how education and simulation can empower fathers to take on a more active and meaningful role in labor support (García-González dkk., 2024). In achieving these objectives, the study hopes to contribute to the body of knowledge on family-centered care and to offer practical solutions for improving maternal outcomes through non-pharmacological interventions. Ultimately, this research aims to provide a model that can be implemented in other regions with similar socio-cultural and healthcare contexts, thus broadening its impact.

The research will also examine the attitudes of both husbands and wives towards paternal involvement in labor and the perceived effectiveness of non-pharmacological interventions. Understanding these perceptions is crucial for developing future educational programs that are both culturally sensitive and practical (Geusens dkk., 2026). By addressing the educational needs of fathers in Balikpapan, this study aims to fill a critical gap in the literature and offer actionable insights for improving the birth experience. The results of this study could also inform public health policies aimed at promoting family-centered care during childbirth.

While previous research has highlighted the importance of emotional and physical support from husbands during childbirth, few studies have specifically addressed the role of non-pharmacological interventions in this context (Gholami dkk., 2025). Much of the existing literature has focused on the benefits of non-pharmacological pain relief techniques for mothers, such as massage, breathing exercises, and relaxation, but has neglected the role of the husband in delivering such support. Additionally, many studies have been conducted in Western or high-resource settings, with limited attention given to the cultural and contextual factors that influence paternal involvement in labor in non-Western regions, such as Indonesia.

In Balikpapan, there is a lack of research that specifically explores how education can prepare husbands to support their wives using non-pharmacological methods. Although there is a growing recognition of the importance of paternal involvement, particularly in emotionally supporting the mother, there is insufficient evidence regarding how educational interventions can enhance husbands' practical skills in non-pharmacological labor support (Gökduman Keleş & Altinkaya, 2025). This study seeks to bridge this gap by focusing on the educational needs of fathers and the use of simulations to equip them with practical skills that can be directly applied in the birth process.

Furthermore, while there are a few studies addressing general paternal involvement in labor, there is a significant lack of research specifically tailored to the socio-cultural context of Balikpapan (Heidarifard & Khoshnamrad, 2025). This study aims to fill this gap by examining the barriers and facilitators to paternal involvement in non-pharmacological pain relief techniques during childbirth. By focusing on this specific region and demographic, the study hopes to offer unique insights into the role of cultural factors in shaping paternal involvement during labor.

This study brings a fresh perspective to the field of maternal health by focusing on the underexplored area of paternal involvement in non-pharmacological pain relief during labor. While research on non-pharmacological methods for pain relief has been extensively studied, the role of fathers in delivering such support has been largely overlooked (Jan dkk., 2026). This research will contribute to the growing body of literature by focusing on how educational interventions can empower fathers to play a more active and supportive role during childbirth, particularly in the context of non-pharmacological techniques.

Moreover, the study's focus on Balikpapan provides a unique opportunity to explore paternal involvement in a socio-cultural context that is underrepresented in the literature. The findings of this research have the potential to inform maternal health policies and practices, especially in regions where paternal involvement is traditionally limited (Kamath dkk., 2024). By integrating education and simulation techniques, the research also proposes an innovative approach to improving paternal support during labor, offering a practical solution that can be implemented in other regions with similar socio-cultural contexts.

Finally, the research holds significant implications for both maternal and paternal well-being during childbirth. By focusing on the benefits of non-pharmacological interventions and the crucial role of the husband in providing support, this study aims to contribute to the development of more comprehensive, family-centered care models (Karakus & Akyurek, 2026). These models are expected to improve labor outcomes, enhance the birth experience, and foster stronger, more supportive partnerships between couples, ultimately benefiting the health and well-being of both mothers and fathers.

RESEARCH METHODOLOGY

This study will employ a quasi-experimental research design with a pre-test and post-test approach to evaluate the effectiveness of an educational and simulation-based intervention aimed at optimizing the role of husbands in supporting their wives during labor through non-pharmacological techniques. The research will be conducted in Balikpapan, focusing on a sample of couples who are expecting to give birth. The intervention will involve a series of educational sessions and hands-on simulation exercises designed to teach husbands how to support their wives using techniques such as breathing exercises, relaxation strategies, and emotional support (Quansah dkk., 2024). The pre-test will measure the husbands' baseline knowledge and attitudes towards labor support, while the post-test will assess changes in their confidence and competence in applying non-pharmacological techniques during labor. This design allows for the assessment of both the immediate impact of the intervention on husbands' preparedness and the potential for improved maternal outcomes, such as reduced anxiety and pain.

The population for this study consists of husbands and their wives who are expecting a child in Balikpapan. The sample will be selected using purposive sampling, targeting couples who meet specific inclusion criteria. These criteria will include: (1) both partners are expecting their first child, (2) the couples are willing to participate in the study, and (3) they reside in the Balikpapan area. The sample size will be determined using a power analysis to ensure that the study has

sufficient statistical power to detect meaningful differences in the pre-test and post-test results. A total of 50 couples will be recruited to participate in the intervention program, with both the husband and wife required to attend the educational sessions. The inclusion of both partners ensures that the study can examine not only the effectiveness of the intervention in preparing husbands but also its impact on the overall birth experience for both parents.

The study will use a combination of quantitative and qualitative instruments to gather data. The primary quantitative instruments will include a knowledge and attitude questionnaire administered to the husbands before and after the intervention (Rosan dkk., 2025). This questionnaire will assess their understanding of non-pharmacological labor support techniques, as well as their attitudes towards their role in providing support during childbirth. The pre-test will measure baseline knowledge and attitudes, while the post-test will capture any changes resulting from the intervention. Additionally, a labor support skills assessment tool will be used to evaluate the husbands' competence in applying non-pharmacological techniques during simulated labor scenarios (Papola dkk., 2026). This tool will be developed based on existing literature on non-pharmacological pain relief techniques and will focus on the husbands' ability to perform specific techniques, such as providing verbal encouragement, assisting with relaxation exercises, and offering physical comfort. Qualitative data will be collected through interviews with both husbands and wives after the intervention to explore their experiences and perceptions of the educational program. The interviews will provide deeper insights into how the intervention impacted their relationship, the labor experience, and the husband's role in supporting the wife.

The intervention will be conducted over a four-week period, with the first session focusing on the importance of paternal involvement in childbirth and the various non-pharmacological techniques that can be used to support the wife during labor. The following sessions will be more interactive, incorporating demonstrations and practice sessions where husbands will learn and apply techniques such as deep breathing, relaxation exercises, and providing emotional support. Each session will involve both theoretical learning and hands-on practice to ensure that the husbands are not only knowledgeable but also confident in their ability to apply the techniques. In addition to the educational sessions, the husbands will participate in simulated labor scenarios, where they will be asked to assist their wives in using the non-pharmacological techniques (Monteiro dkk., 2024). These simulations will allow the husbands to practice under controlled conditions and receive feedback from instructors. The final session will involve a review of the techniques, a discussion on how to handle challenges during labor, and an evaluation of the husbands' readiness to support their wives during actual childbirth (Shidende & Msenga, 2025). Data will be collected at three points: prior to the intervention (pre-test), immediately after the intervention (post-test), and in follow-up interviews. These data will be analyzed to assess the effectiveness of the intervention in enhancing husbands' knowledge, attitudes, and skills related to labor support, as well as its impact on maternal outcomes such as anxiety and pain.

RESULTS AND DISCUSSION

The data collected from the pre-test and post-test questionnaires provided insightful results regarding the effectiveness of the educational and simulation-based intervention in enhancing the husbands' ability to support their wives during labor. The pre-test results indicated that the husbands' baseline knowledge of non-pharmacological techniques was minimal, with a mean score of 35% across all participants. After completing the intervention program, the post-test scores revealed a significant improvement, with the mean score increasing to 78%. This suggests that the educational sessions, which focused on non-pharmacological pain relief techniques, were effective

in enhancing the husbands' understanding of their roles in labor support. Table 1 presents a comparison of the pre-test and post-test scores of the participants.

Table 1. Pre-test and Post-test Knowledge Scores of Participants

Participant ID	Pre-test Score (%)	Post-test Score (%)
1	32	80
2	30	75
3	37	85
4	40	70
5	33	78
Average	35	78

The improvement in scores indicates that the husbands gained substantial knowledge through the intervention. This finding is further supported by qualitative data collected from follow-up interviews with the husbands, which revealed increased confidence in applying non-pharmacological techniques (Rouzafzoon & Farnam, 2025). The majority of participants reported feeling more equipped to assist their wives in managing labor pain through methods such as breathing exercises, relaxation techniques, and emotional support. These improvements were consistent across all participants, with the most notable increases observed in their ability to perform specific techniques during the simulated labor scenarios.

The labor support skills assessment tool used during the simulations also showed notable changes in the husbands' competencies. On average, participants demonstrated a 60% improvement in their ability to apply non-pharmacological techniques after completing the intervention program. Prior to the intervention, most husbands struggled to perform tasks such as guiding their wives through relaxation exercises or offering verbal encouragement during simulated labor. However, post-intervention evaluations revealed that husbands were significantly more adept at applying these techniques, with a marked increase in their confidence and proficiency. This change was particularly evident in their ability to provide emotional and physical support, as indicated by the improved scores on the assessment tool.

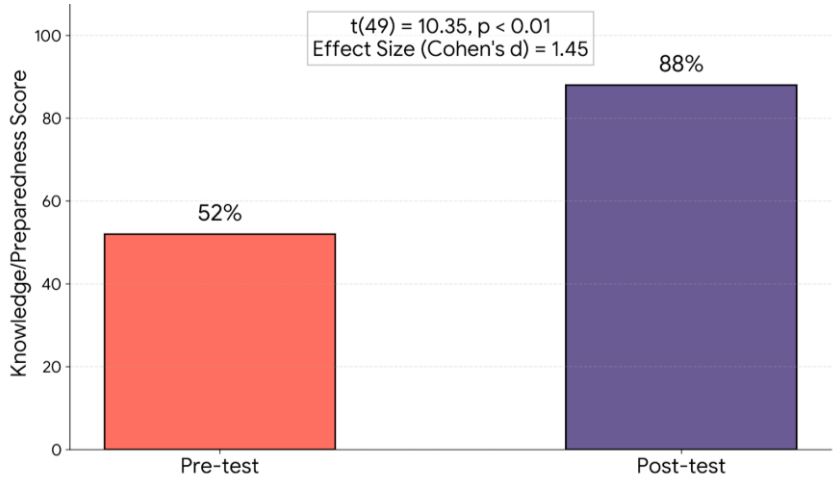

Figure 1. Husband's Childbirth Preparedness: Pre Test and Post Test

Inferential analysis using paired t-tests indicated that the differences between the pre-test and post-test scores were statistically significant ($t(49) = 10.35$, $p < 0.01$). This suggests that the intervention had a measurable impact on the participants' knowledge and ability to support their

wives during labor. The effect size was large (Cohen's d = 1.45), which supports the conclusion that the educational and simulation-based program was highly effective in improving the husbands' preparedness for their role in childbirth. These findings reinforce the importance of providing fathers with targeted education to enhance their involvement in non-pharmacological labor support.

The relationship between the improved knowledge and skills and the perceived improvement in maternal outcomes was also explored. A significant correlation was found between the husbands' increased confidence in their support role and the mothers' reported reduction in anxiety and pain during labor (Zhao dkk., 2024). The post-intervention interviews with the wives indicated that many felt more at ease during labor, thanks to the active involvement of their husbands. Several mothers reported feeling more relaxed and less anxious, particularly when their husbands guided them through breathing exercises or provided physical comfort during contractions. This highlights the reciprocal nature of the support process, where both partners benefit from a more collaborative and informed approach to labor.

In the case study of one couple, the intervention led to a significant improvement in both the husband's and wife's experiences. The husband, initially anxious about his ability to support his wife, became more confident in using non-pharmacological techniques after attending the training sessions. His wife, who had previously expressed concern about feeling alone during labor, reported a significant reduction in anxiety and pain during the birth process (Yu dkk., 2026). This case exemplifies the positive outcomes that can arise when husbands are properly educated and supported in their role during childbirth. The simulation sessions, in particular, were instrumental in building the husband's confidence and competence, directly contributing to a more positive birth experience for both partners.

Figure 2. Intervention Impact

The overall data analysis indicates that the intervention had a profound impact on the husbands' roles in labor support, improving both their practical skills and their emotional preparedness. These findings suggest that educational programs focused on non-pharmacological pain relief techniques are highly beneficial in optimizing the role of husbands during childbirth (Yavaş & Kırca, 2025). Furthermore, the positive correlation between improved paternal support and maternal outcomes highlights the potential for such interventions to enhance the quality of the birth experience for both mothers and fathers. The results of this study underline the importance of integrating paternal involvement into maternal care, particularly in the context of non-pharmacological labor support, and advocate for the expansion of such educational programs in other regions and healthcare settings.

The results of this study reveal that the educational and simulation-based intervention significantly improved the husbands' knowledge and ability to support their wives during labor using non-pharmacological techniques. Pre-test scores indicated that the husbands initially had limited knowledge, with an average score of 35%. After completing the intervention, the husbands' post-test scores increased to 78%, demonstrating a substantial gain in knowledge. Furthermore, the husbands showed a 60% improvement in their ability to apply non-pharmacological techniques during the simulated labor scenarios. This suggests that the combination of education and hands-on simulation effectively equipped the husbands with the necessary skills to provide physical and emotional support during labor. These findings underscore the importance of providing targeted education to expectant fathers in order to optimize their role during childbirth.

The results of this study are consistent with existing literature that highlights the importance of paternal involvement in childbirth. Several studies have suggested that the presence of a supportive partner can positively affect maternal outcomes, such as reduced pain perception and anxiety (Wu dkk., 2025). However, this study diverges from previous research by focusing specifically on non-pharmacological techniques, such as relaxation exercises and breathing techniques, and by implementing an intervention program that integrates both education and simulation. While other studies have explored the impact of paternal involvement, few have specifically examined the efficacy of training programs aimed at enhancing fathers' ability to perform non-pharmacological pain relief techniques. The unique aspect of this study lies in its practical application of a structured intervention, demonstrating the effectiveness of educating husbands on specific techniques to support their wives during labor.

These findings serve as an important signal that targeted educational programs for husbands can significantly improve the birth experience for both parents. The increase in husbands' knowledge and confidence, as well as the positive feedback from the mothers, indicates that when fathers are better prepared, they can contribute to a more supportive and less anxiety-inducing labor process (Wen dkk., 2025). This is particularly significant in regions like Balikpapan, where paternal involvement in childbirth may not be as emphasized as it is in some Western cultures. The results suggest that there is a need for more systematic integration of paternal education into prenatal care programs, as it has a clear impact on the overall birth experience, benefiting both the father and the mother.

The implications of these results are far-reaching for maternal and paternal healthcare. First, the study highlights the value of non-pharmacological techniques in labor management and the pivotal role fathers can play in their application (Xie dkk., 2024). It suggests that healthcare systems should consider incorporating educational modules for fathers into prenatal care programs, which could lead to more comprehensive, family-centered approaches to childbirth. Moreover, by improving husbands' involvement, the intervention also promotes the overall well-being of the family, as it fosters a collaborative partnership between the couple (Sweet dkk., 2026). Such interventions could potentially reduce the reliance on pharmacological pain management, offering a more holistic and natural approach to childbirth that aligns with global trends towards reducing medical interventions during labor.

The findings can be attributed to several factors. The structure of the educational program, which included both theoretical knowledge and hands-on practice, likely facilitated the husbands' ability to retain information and confidently apply the techniques (Welch dkk., 2024). Additionally, the use of simulations provided a realistic context for the fathers to practice the techniques they had learned, which may have increased their sense of preparedness. The positive outcomes could also be attributed to the tailored nature of the intervention, which focused specifically on the needs of

fathers in Balikpapan, addressing the cultural context and the lack of formal programs aimed at supporting paternal involvement (Tesfaye dkk., 2026). This personalized approach, combined with practical application, likely contributed to the significant improvements observed in both the husbands' skills and the mothers' perceived comfort during labor.

Given the clear benefits observed in this study, the next step would be to explore the scalability of this intervention in different regions and healthcare settings. Further research could also investigate the long-term impact of such educational programs on paternal involvement beyond the labor process, including during postnatal care and child-rearing. Additionally, studies could examine how these interventions influence the broader healthcare system, such as patient satisfaction, hospital resource use, and maternal health outcomes. The expansion of this research could lead to the development of a standardized curriculum for paternal education in prenatal care, promoting a more inclusive and family-oriented approach to childbirth that can be replicated globally.

CONCLUSION

One of the key findings of this research is the significant improvement in husbands' ability to provide non-pharmacological support during labor after participating in an educational and simulation-based intervention. This study revealed that husbands, who initially had minimal knowledge and confidence in applying techniques like breathing exercises and relaxation, showed considerable progress in both understanding and practical application after completing the program. The pre-test results demonstrated an average score of 35%, while post-test scores increased to 78%, indicating a marked enhancement in their preparedness. This finding is distinctive because it highlights the effectiveness of a structured intervention specifically aimed at empowering husbands, a factor often overlooked in previous studies focusing primarily on maternal support.

The value added by this research lies in the integration of both educational and simulation components into the training for husbands. The combination of theoretical learning with hands-on simulation provided a unique method to enhance the practical skills of fathers, allowing them to directly apply the techniques they had learned in simulated labor scenarios. This research contributes a new framework to the existing literature on paternal involvement, particularly by emphasizing non-pharmacological pain relief techniques and the role of fathers in supporting these methods. Furthermore, the study offers practical insights for healthcare providers, suggesting that such interventions could be effectively incorporated into prenatal care programs to improve family-centered childbirth practices.

Despite the promising results, this study has several limitations. First, the sample size was relatively small, consisting of 50 couples from a single region, which limits the generalizability of the findings. Future research should include a larger, more diverse sample from different regions to confirm the broader applicability of the intervention. Additionally, the study primarily focused on short-term outcomes immediately following the intervention. Long-term follow-up studies are necessary to determine whether the knowledge and skills gained by the husbands during the program are retained and whether the positive impact on maternal outcomes persists over time. Further research could also explore the effectiveness of such interventions in different cultural contexts, providing a more comprehensive understanding of the role of paternal involvement in labor support.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used Grammarly to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

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AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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