Teaching-learning process and the attitude toward scientific research among midwifery students

John Barja-Ore[1], Willy Ramos[2,3], Jhony A. De La Cruz Vargas[2], Rudi Amalia Loli Ponce[4]

Abstract:

BACKGROUND: Research in universities requires systematic and participatory processes that integrate teachers, contents, strategies and tools, and students and their own interests. Therefore, the main objective of this study was to establish the relationship between the perception of the teaching-learning process (TLP) and the attitude toward scientific research among midwifery students.

MATERIALS AND METHODS: Descriptive cross-sectional study, conducted on 250 students from second to fourth year of study selected by convenience sampling. The data were collected with two self-administered Likert-type scales that were validated in content and construct, both with high reliability. Descriptive statistics were carried out; the Spearman correlation test was used prior to the application of the Kolmogorov–Smirnov test and Kendall's tau-b test.

RESULTS: The favorable perception of the TLP was greater among second-year students (42.6%), in addition, 15.2% agreed that the advice of teachers contributes to the elaboration of the research protocol. The attitude of indifference toward research was more frequent in third-year students (58.2%) and 28.4% were deemed in disagreement to be able to identify and operationalize the variables. In the analysis of dimensions, the role of the student had a moderate relationship with the research design (rho = 0.536; $P < 0.001$), while a weak relationship was demonstrated between media and techniques with ethical and scientific value (rho = 0.104; $P < 0.001$).

CONCLUSION: The TLP perceived by midwifery students and their attitudes toward scientific research had a direct and significant correlation. The proportion of students with favorable perception was greater among those with a favorable attitude.

Keywords:
Attitude, learning, midwifery, research, teaching

[1]Academic Deparment, Universidad Privada del Norte, Lima, Perú, [2]Instituto de Investigaciones en Ciencias Biomédicas (INICIB), Universidad Ricardo Palma, Lima, Perú, [3]Instituto de Investigaciones Clínicas, Universidad Nacional Mayor de San Marcos, Lima, Perú, [4]Facultad de Medicina, Universidad Nacional Mayor de San Marcos, Lima, Perú

Address for correspondence:
Dr. John Barja-Ore, Prolongación Húsares de Junín N° 201. Urbanización El Retablo, Comas. Lima, Perú.
E-mail: john.barja@upn.pe

Introduction

Scientific research is one of the main purposes of higher education, whereby, the training process of the students should be aimed at the development and consolidation of their research abilities and skills.[1] For this, the presence of human resources, space, strategies, and tools that favor the construction and reconstruction of knowledge of every agent involved in the development of this area is necessary.

Research teaching-learning is positioned as a critical training process, given the close and dynamic relationship created between teachers and students, as well as the elements used for each one of them.[2] In current approaches, the student has a more active role to favor the self-management of their knowledge, behavior, and attitudes, with the support of the teacher as a facilitator.[3,4] Nevertheless, it has been recognized that the student perception regarding this process altogether plays a key role in its success, specially facing the existence of an inadequate research culture within the university community.[5]

Despite the relevance of the teaching-learning process (TLP) in the academic and scientific training of undergraduate students, challenges and difficulties still exist in the educational context that demand the adoption of innovative approaches which favor a positive attitude toward research. Due to the elevated predictive capacity of these attitudes on determined conducts, its study is fundamental to promote the scientific production and dissemination, as well as the identification and generation of scenarios for the development of knowledge and critical thinking.[6-8]

According to Corrales-Reyes and Dorta-Contreras,[9] the existence of negative or indifferent attitudes toward this training field may be a sign of the dissonance between the content taught and what is expected that the student learns within the research development framework. As it has been concluded in a study developed in Peru, when faced with a better perception of the training process in the field of scientific research, more positive attitudes are presented toward each one of its components.[5] Other research shows that the majority of midwifery and nursing students perceive research as a complicated and stressful subject and are not interested in getting involved in the development of scientific studies, due to scant opportunities to develop research, lack of institutional support, or conceding of subventions, as well as the lack of promotion of the research culture.[10-13]

In the Faculty of Medicine of the National University of San Marcos, of Peru, medical education, in quantitative and qualitative terms, is still an artist awaiting development, and the research processes themselves are an important line of research.[14] In the last 10 years, teacher-student activities have been implemented at the Professional School of Midwifery of this Faculty, with the aim of strengthening all the components of the TLP in this area, which makes it more important when we take into account that a study carried out among last year students at this school showed that 40.9% had a regular attitude toward research development.[15]

In accordance with what we stated, the aim of the study was to establish a relationship between the perception of the teaching-learning process (TLP) and the attitude toward scientific research in midwifery students of the National University of San Marcos.

Materials and Methods

Study design and setting
A descriptive cross-sectional study that was conducted in 2019 in the National University of San Marcos

Study participants and sampling
The study population was 308 midwifery students from the National University of San Marcos. The sample was estimated with a confidence interval of 95%, a precision of 5%, and an expected proportion (pi) with the phenomenon of 50%, with which the sample size was 171 students; nonetheless, it was possible to include 250. Subjects were selected by convenience sampling and students registered in the academic semester 2019-II that completed the research courses were included. We excluded those that were absent during the period of instrument implementation and that did not accept to participate voluntarily.

Data collection tool and technique
The study variables were the perception of TLP of the scientific research, understood as the joint assessment of the human resources, materials, methods, and strategies linked to this process, and the attitude toward scientific research, defined as the predisposition toward the planning and development process and the importance of the research.

Two instruments used were the scale about perception on research teaching-learning process (SRTLP) and the scale about attitude toward research (SAR). The content validation of both scales, in spanish language, was carried out through the evaluation by five expert judges associated with the areas of scientific research and university teaching. This process allowed the improvement of syntax and semantics of the proposed items in the function of its pertinence, objectivity, clarity, and relevance.

For the construct validation of SRTLP, the Kaiser–Meyer–Olkin (KMO = 0.858) and Bartlett sphericity tests ($P < 0.001$) were performed, and after the exploratory analysis, through main components, such as Varimax rotation, four dimensions that explained the 59.5% of total variance were identified: teaching activity (items 4, 13, 7, 18, 15, and 1), student role (items 9, 16, 5, 2, and 8), means and techniques (items 17, 11, 3, and 12) and methods and tools for understanding (items 6, 10, and 14).

For EAI (SAR), the Kaiser–Meyer–Olkin (KMO = 0.804) and the Bartlett sphericity ($P < 0.001$) tests were applied, and after the exploratory analysis, through main principles with Quartimax rotation, four dimensions were identified which explained the total variance of 56.1%: Research design (items 6, 15, 10, 18, 1, 4, 13, and 16), ethical and scientific value (items 12, 17, and 2), dissemination guidelines and forms (items 7, 9, 5, and 14), and methodological and statistical design (items 8, 3, and 11).

A pilot study was carried out in 160 last year obstetric students from different universities in Lima, Peru and the Cronbach's Alpha coefficient was calculated. The SRTLP,

had an elevated global reliability ($\alpha = 0.890$), as well as the dimensions of teaching activity ($\alpha = 0.846$), student role ($\alpha = 0.811$) and means and techniques ($\alpha = 0.727$), while the dimension of methods and tools for understanding was moderate ($\alpha = 0.651$). The SAR presented an elevated global reliability ($\alpha = 0.844$), same as the dimensions of research design ($\alpha = 0.787$), ethical and scientific value ($\alpha = 0.716$) and dissemination guidelines and forms ($\alpha = 0.747$), while the dimension of methodological and statistical design was moderate ($\alpha = 0.611$).

The instrument items presented five answer options in the Likert scale (1–5). The research TLP perception was classified as favorable (67–90 points), moderately favorable (42–66 points), and unfavorable (18–41 points). Attitude was classified as acceptance (67–90 points), indifferent (42–66 points), and rejection (18–41 points).

The data was coded, digitized, and later processed in the SPSS version 26 statistical software. The estimate of absolute and relative frequencies for the categorical values was carried out, and of the mean and standard deviation for the numerical values. Spearman's correlation test was used after the Kolmogorov–Smirnov was applies, as well as Kendall's tau-b test. The calculations were carried out with a confidence level of 95%.

Ethical consideration

The study was approved by the research ethics committee of the Faculty of Medicine of National University of San Marcos (N°19-0092). Furthermore, we counted on the institutional authorization of the Professional School of Midwifery. An informed consent was used as a sign of voluntary participation and information confidentiality was guaranteed.

Results

In Table 1, we show that the moderately favorable perception of TLP was more frequent in all the years of study. The attitudes of acceptance and indifference toward research were the same among fourth-year students (49.4%), while rejection was present in minimal proportions in every year. The TLP perception had an indirect and weak correlation with the year of study ($\alpha = -0.216$)

Table 2 gives the presence of spaces that favor learning of research programs or tools (2.4 ± 1) and that the library counts with an updated data base and virtual access to indexed journals (2.9 ± 1.1) were the least valued TLP. Meanwhile, the teacher assesses the methodology coherence (14.4%) and the contribution of their advice for the research protocol development (15.2%) were indicators agreed upon by the students with greater frequency. Approximately half of them indicated not being sure with respect to their capacity to theoretically and methodologically argue research.

The indicators of attitude toward scientific research are given in Table 3. With respect to them, that the students consider that research generates scientific knowledge and develops critical thinking (4.3 ± 0.7), and value the use of informed consent in its development (4.4 ± 0.6) were the best valued. On the other hand, there was a greater proportion of students that disagreed with the process of the identification and operationalization of variables (28.4%).

In Table 4, we observe that all dimensions of the variables in the study were directly significantly related, but with different magnitudes. The correlation between the student role and the research development was moderate (rho = 0.536; $P < 0.001$), meanwhile, the correlation of means and techniques with ethical and scientific value were weak (rho = 0.104; $P < 0.001$). The low-moderate correlation between dimensions indicates an absence of co-linearity between them.

In Table 5, the TLP perception is shown to have a direct and moderate correlation with attitude toward research (Spearman's Rho = 0.545; $P < 0.001$). Furthermore, the proportion of students with favorable perception was greater among those with favorable

Table 1: Perception teaching-learning process and attitude towards scientific research according to year of study

Perception of teaching-learning process and attitude towards research	Year of Study						Kendall's Tau-b *P*
	Second year		Third year		Fourth year		
	n	%	*n*	%	*n*	%	
Perception of the research teaching-learning process							
Unfavorable	3	3,.1	3	3.8	1	1.3	-0.216
Moderately favorable	51	54.3	61	77.2	64	83.1	<0.001
Favorable	40	42.6	15	19.0	12	15.6	
Attitude towards research							
Rejection	1	1.1	1	1.3	1	1.2	-0.072
Indifference	39	41.5	46	58.2	38	49.4	<0.001
Acceptance	54	57.4	32	40.5	38	49.4	
Total	94	100	79	100	76	100	

Table 2: Description of the indicators of perception of research TLP

Items of SRTLP	Mean±S.D	Totally disagree *n* (%)	Disagree *n* (%)	Not agree not disagree *n* (%)	Agree *n* (%)	Totally agree *n* (%)
The teacher evaluates the coherence of methodology in research projects	3.7±0.8	2 (0.8)	16 (6.4)	60 (24.0)	136 (54.4)	36 (14.4)
Formulated research problems ease to develop feasibly.	3.5±0.7	3 (1.2)	17 (6.8)	79 (31.6)	136 (54.4)	15 (6.0)
Participation is promoted through research workshops.	3.2±0.9	10 (4.0)	44 (17.6)	88 (35.2)	88 (35.2)	20 (8.0)
Teacher emphasizes the relevant aspects of scientific research.	3.7±0.8	1 (0.4)	18 (7.2)	64 (25.6)	132 (52.8)	25 (14.0)
Previously reviewed the content that will be presented in class.	3.0±0.9	11 (4.4)	60 (24.0)	94 (37.6)	77 (30.8)	8 (3.2)
Was able to argue the research correctly from a theoretical and methodological approach.	3.3±0.7	4 (1.6)	25 (10.0)	111 (44.4)	102 (40.8)	8 (3.2)
The teacher offers a time to verify the learning and absolve doubts with respect to the research process.	3.6±0.8	3 (1.2)	25 (10.0)	60 (24.0)	134 (53.6)	28 (11.2)
Was able to schematically build the research project.	3.5±0.7	4 (1.6)	21 (8.4)	83 (33.2)	128 (51.2)	14 (5.6)
I remain attentive and motivated during the entire development of the research class.	3.1±0.8	9 (3.6)	43 (17.2)	98 (39.2)	92 (36.8)	8 (3.2)
PPT presentations contain updated and relevant information to understand the research process.	3.5±0.8	2 (0.8)	28 (11.2)	70 (28.0)	125 (50.0)	25 (10.0)
In practice lessons, groups are formed to analyze research ideas or results.	3.5±1.0	13 (5.2)	34 (13.6)	56 (22.4)	110 (44.0)	37 (14.8)
There are spaces to learn the management of statistical programs or tools that enable research development.	2.4±1.0	50 (20.0)	92 (36.8)	61 (24.4)	40 (16.0)	7 (2.8)
Learning strategies applied by teachers are dynamic and enable scientific research learning.	3.1±0.9	15 (6.0)	49 (19.6)	88 (35.2)	86 (34.4)	12 (4.8)
Scientific literature readings provided in the research courses enable us to understand and analyze the research process.	3.5±0.9	4 (1.6)	38 (15.2)	63 (25.2)	119 (47.6)	26 (10.4)
Research advising carried out by teachers enables the research project progress.	3.7±0.8	4 (1.6)	22 (8.8)	60 (24.0)	126 (50.4)	38 (15.2)
I actively participate in theoretical and practice classes in the development of research projects.	3.2±0.8	5 (2.0)	38 (15.2)	110 (44.0)	90 (36.0)	7 (2.8)
The library counts with an updated data base and virtual access to indexed journals.	2.9±1.1	37 (14.8)	37 (14.8)	82 (32.8)	82 (32.8)	12 (4.8)
The teacher guides the research to the career development area.	3.2±0.8	6 (2.4)	16 (6.4)	53 (21.2)	141 (56.4)	34 (13.6)

SD: Standard desviation

attitude (43.5%) and, in total, those who had an attitude of rejection had a unfavorable perception.

Discussion

The scientific research development within the training institutions of higher education requires systematic, harmonic, and participating processes that integrate teachers, content they deliver and the ways in which they carry them out and the tools applied for them, as well as the students, to develop and strengthen the research competencies in the latter.

The main finding in this study was the direct relationship between the TLP perception and the attitude toward research, which coincides with that emphasized by Ochoa-Vigo *et al*.[5] who refers that, when facing a favorable perception in this area, the attitudes will be more positive. This is reinforced with what was reported in a study carried out in Japan, in which students with a better research assessment

presented a more favorable internalization of their learning process.[16] Results differed from a research carried out on Syrian students, since, despite the majority showing a positive attitude, they considered their training in this field inadequate.[17]

According to findings, the teacher's actions as part of the training process are a component that may influence the attitudes their students develop and that the limitations present in them may be a reflection of the role the teacher plays in the training process. This becomes more relevant if we consider that Kyaw *et al*.[18] reported that an obstacle in research development was the inadequate advising offered by teachers and the lack of contribution to knowledge and skill development. For this reason, we acknowledge that teachers have a responsibility to enrich and guide the research learning experience, so that students do not formulate complex research questions, which are not feasible to answer from a theoretical or methodological approach, and thereby ensure that the experience in conducting a study is favorable.[19]

Table 3: Description of attitude indicators towards scientific research

Items of SAR	Mean±SD	Totally disagree n (%)	Disagree n (%)	Not agree not disagree n (%)	Agree n (%)	Totally agree n (%)
I get research ideas easily.	3.0±0.9	12 (4.8)	50 (20.0)	112 (44.8)	65 (26.0)	11 (4.4)
I believe research contributes to generating scientific knowledge and develop critical thinking.	4.3±0.7	3 (1.2)	2 (0.8)	15 (6.0)	124 (49.6)	106 (42.4)
I believe the design and research type selection is an interesting process.	3.7±0.7	3 (1.2)	12 (4.8)	63 (25.2)	139 (55.6)	33 (13.2)
I find it easy to formulate a research problem and objectives.	3.2±0.8	6 (2.4)	41 (16.4)	92 (36.8)	99 (39.6)	12 (4.8)
I consider belonging to a research group contributes to the dissemination and relevance of scientific studies.	4.1±0.7	3 (1.2)	5 (2.0)	29 (11.6)	136 (54.4)	77 (30.8)
I try to explore articles in indexed scientific journals.	3.5±0.7	2 (0.8)	17 (6.8)	86 (34.4)	129 (51.6)	16 (6.4)
I try to carry out the bibliographic citations and references according to current norms and styles.	3.8±0.8	3 (1.2)	11 (4.4)	49 (19.6)	143 (57.2)	44 (17.6)
I consider that identification and operationalization of variables is an easy development process.	2.9±0.9	16 (6.4)	71 (28.4)	91 (36.4)	62 (24.8)	10 (4.0)
I find it interesting to share research articles with my classmates.	3.4±0.8	2 (0.8)	27 (10.8)	105 (42.0)	99 (39.6)	17 (6.8)
I think the use of keywords allows the search of information.	4.0±0.7	3 (1.2)	4 (1.6)	33 (13.2)	149 (59.6)	61 (24.4)
I am interested in understanding the types of statistical analysis that research requires.	3.6±0.8	3 (1.2)	18 (7.2)	81 (32.4)	116 (46.4)	32 (12.8)
I find the use of informed consent in research important and necessary.	4.4±0.6	2 (0.8)	1 (0.4)	13 (5.2)	109 (43.6)	125 (50.0)
I find the selection process of background and theories that will support my research interesting.	3.9±0.8	2 (0.8)	12 (4.8)	42 (16.8)	141 (56.4)	53 (21.2)
I show interest in learning the process of publishing articles in indexed journals.	3.3±0.8	3 (1.2)	16 (6.4)	87 (34.8)	113 (45.2)	31 (12.4)
When I search for information. I find it easy to organize it in order of relevance.	3.4±0.9	3 (1.2)	43 (17.2)	91 (36.4)	93 (37.2)	20 (8.0)
I try to elaborate the research hypothesis with all the elements it has.	3.4±0.7	1 (0.4)	21 (8.4)	103 (41.2)	116 (46.4)	9 (3.6)
I believe the presentation and discussion of results is the most important part of research.	3.8±0.7	2 (0.8)	7 (2.8)	60 (24.0)	133 (53.2)	48 (19.2)
I feel comfortable when I carry out a critical lecture of thesis and/or research articles.	3.7±0.7	1 (0.4)	12 (4.8)	82 (32.8)	123 (49.2)	32 (12.8)

SD - Standard desviation

Table 4: Spearman correlation between dimensions of TLP perception and attitude towards research attitude

Perception of T-L process of scientific research	Correlation coefficient	Attitude towards scientific research			
		Research development	Ethical and scientific value	Dissemination guidelines and forms	Methodological and statistical design
Teacher activity	Spearman's Rho	0.415[†]	0.374[†]	0.344[†]	0.355[†]
Student role	Spearman's Rho	0.536[†]	0.274[†]	0.512[†]	0.507[†]
Means and techniques	Spearman's Rho	0.280[†]	0.174[†]	0.228[†]	0.450[†]
Methods and tools for understanding	Spearman's Rho	0.448[†]	0.305[†]	0.426[†]	0.470[†]

[†]The correlation is significant with a *P*<0.001

Table 5: Relationship between TLP perception and attitude towards research

Perception of T-L process of scientific research	Attitude towards Research						Spearman's Rho*
	Rejection		Indifference		Acceptance		
	n	%	n	%	n	%	
Unfavorable	3	100	3	2.4	1	0.8	0,545, <0.001
Moderately favorable	0	0	107	87.0	69	55.6	
Favorable	0	0	13	10.6	54	43.5	
Total	3	100	123	100	124	100	

*Correlation estimated based on total scores from scales

This study suggested the transcendence of constructivist approach in the training process, since the attitudes of students toward research development were related with a better perception of their own participation in

the TLP. Bihari *et al*.[20] demonstrate that this approach significantly improves knowledge, skills, and attitudes. In addition, the permanent assessment and re-assessment of their roles in all the spaces of training generated by the educational administrators, teachers, and including themselves, would result as key to the success of said process.

In a study carried out among medical students from different countries we found that 4 out of 10 had an adequate perception about their training process in research,[21] contrary to that identified in the students of this study, since a lower proportion manifested this orientation. On the other hand, half of the students present an attitude of acceptance toward research. Similar to this, a study found that 44% of students had the same predisposition,[22] and that in contrast to this, a research on health science students showed that a positive attitude was infrequent.[23]

Attitudes toward ethical and scientific values of research, compared to other dimensions, maintained relationships of lesser magnitude with the components of TLP. This could unveil the need to reinforce the contents linked to the importance, benefit, and impact of research, as well as the respect to ethical norms established for their development, especially because a prior study shows that almost the total number of students consider them as valuable scientific aspects for training.[24]

Limitation and recommendation

Among the limitations, it is emphasized that the TLP had an indirect measure through the student perception, which is why it cannot be concluded that this develop in an adequate form or not, for this purpose it is suggested that objective instruments be used to evaluate said process. Another limitation is the loss of almost the fifth part of the population because of applying inclusion and exclusion criteria, despite that, the results do not appear to have been affected in a significant manner. It is recommended to develop more studies in students of other health professions.

Conclusions

In this study, TLP of scientific research perceived by midwifery students, research participants, had a direct relationship with their attitudes toward this area of their training. Furthermore, their role as a student was the component that kept a greater magnitude in the relationship with each of the dimensions of their attitude.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflicts of interest

There are no conflicts of interest

References

1. Lavalle C, de Nicolas VL. Peru and its new challenge in higher education: Towards a research university. PloS one 2017;12:e0182631.
2. Gutiérrez IR, Peralta H, Fuentes HC. Integration of research and teaching in medical universities. Educ Méd 2019;20:49-54.
3. Huang Q, Yue Z, Lin J, Zhang Y, Yuan S, Zhuang Q, *et al*. The effect and influence of undergraduate research on medical undergraduates in China. Biochem Molec Biol Educ 2019;47:41-50.
4. Hopkins L, Hampton BS, Abbott JF, Buery-Joyner SD, Craig LB, Dalrymple JL, *et al*. To the point: Medical education, technology, and the millennial learner. Am J Obstet Gynecol 2018;218:188-92.
5. Ochoa-Vigo K, Bello C, Villanueva ME, Ruiz-Garay MI, Manrique GA. Perception and attitudes of the nursing students on their training in research. Rev Med Hered 2016;27:201-15.
6. Mercado M. Attitudes toward research by students of Human Medicine course in the Universidad Peruana Los Andes. Educ Méd 2019;20(Suppl 1):95-8.
7. Kennedy JP, Quinn F, Taylor N. The school science attitude survey: A new instrument for measuring attitudes towards school science. Int J Res Method Educ 2016;39:422-45.
8. Pallamparthy S, Basavareddy A. Knowledge, attitude, practice, and barriers toward research among medical students: A cross-sectional questionnaire-based survey. Perspect Clinical Res 2019;10:73-8.
9. Corrales-Reyes IE, Dorta-Contreras AJ. Students' scientific production: A proposal to encourage it. Medwave 2019;18:e7166.
10. Furaikh SA, Omairi BA, Ganapathy T. A cross-sectional survey on nursing students' attitude towards research. J Health Specialties 2017;5:185.
11. Amoo TB, Gbadamosi O. Nursing and midwifery students'

attitudes towards research: a descriptive study. Asian J Nurs Educ Res 2021;11:375-80.

12. Ramsay A, Wicking K, Yqates K. In what ways does online teaching create a positive attitude towards research in nursing students studying a first year evidence-based practice undergraduate subject online? Nurse Educ Pract 2020;44.102744.

13. Ünver S, Semerci R, Özkan ZK, Avcibşi İ. Attitude of nursing students toward scientific research: A cross-sectional study in turkey. J Nurs Res 2018;26:356-61.

14. Mendoza-Arana PJ. Research on medical education at San Fernando Faculty of Medicine: A systematic perpective. An Fac Med 2012;73:55-61.

15. Barja-Ore J, Otoya-Petit Ó, Vega-Gonzales EO, Moreno-Gutierrez N, Loli RA. Attitudes towards the investigation of rotating obstetrics inmates in a Lima-Peru hospital. Rev Fac Med Hum 2019;19:53-9.

16. Imafuku R, Saiki T, Kawakami C, Suzuki Y. How do students' perceptions of research and approaches to learning change in undergraduate research? Int J Med Educ 2015:6:47-55.

17. Turk T, Al Saadi T, Alkhatib M, Hanafi I, Alahdab F, Firwana B, *et al*. Attitudes, barriers, and practices toward research and publication among medical students at the University of Damascus, Syria. Avicenna J Med 2018;8:24-33.

18. Kyaw Soe HH, Than NN, Lwin H, Nu M, Phyu KL, Abas AL. Knowledge, attitudes, and barriers toward research: The perspectives of undergraduate medical and dental students.

J Educ Health Promot 2018;7:23.

19. Debasish L, Vasudevan K, Dhasaram P, Mathiyalagen P. Sensitizing the medical undergraduates to qualitative research: In the context of experiential learning debriefings. J Educ Health Promot 2022;11:130. doi: 10.4103/jehp.jehp_807_21.

20. Bihari A, Choudhari SG, Srivastava A. Effectiveness of problem-based learning approach for teaching-learning biostatistics among medical students. J Educ Health Promot 2021;10:264.

21. Funston G, Piper RJ, Connell C, Foden P, Young AM, O'Neill P. Medical student perceptions of research and research-orientated careers: An international questionnaire study. Med Teach 2016;38:1041-8.

22. Al-Hilali SM, Al-Kahtani E, Zaman B, Khandekar R, Al-Shahri A, Edward DP. Attitudes of Saudi Arabian undergraduate medical students towards health research. Sultan Qaboos Univ Med J 2016;16:e68-73.

23. Chellaiyan VG, Manoharan A, Jasmine M, Liaquathali F. Medical research: Perception and barriers to its practice among medical school students of Chennai. J Educ Health Promot 2019;8:134.

24. El Achi D, Al Hakim L, Makki M, Mokaddem, M, Khali PA, Kaafarani BR, *et al*. Perception, attitude, practice and barriers towards medical research among undergraduate students. BMC Med Educ 2020;20:195.