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Identifying the barriers to the integration of research into graduate midwives' professional practice in the Highlands of Papua New Guinea

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ABSTRACT:

Background: Research is fundamental in improving health through informing health practices and policies. Despite significant capacity building in some areas to support health research efforts, research capacity in low-middle countries, such as Papua New Guinea, is weak. Bachelor of Midwifery students at the University of Goroka, between 2012 and 2016, were introduced to research and produced a proposal for a small study to be implemented when they returned to their place of work as qualified midwives. Despite students being very enthusiastic about carrying out the research during the development of their research proposal, there was limited evidence of them being able to successfully complete their research. This study aimed to understanding the barriers perceived by the graduate midwives to performing research in their own setting so as to inform development of strategies to support the students and graduates in their research efforts in the future.

Methods: An exploratory, descriptive study was conducted using a qualitative approach. Semi-structured interviews were conducted with nine Bachelor of Midwifery graduates from the University of Goroka practising in the Eastern Highlands Province of Papua New Guinea. Data was thematically analysed using Braun and Clark's six stage approach and themes and sub-themes identified.

Findings: Participants viewed research as a skill set and a tool that could be used for problem solving, improving practice and creating evidence. Although some participants were confident with some research skills and had started a research study, they felt they did not have enough skills to complete the study. Others stated that although they were interested to undertake research, they did not understand the research process, and were lacking in knowledge and skills. Barriers to performing research identified by participants included lack of time, lack of support in the workplace, lack of resources and no culture of research in the workplace. Enablers identified included having an experienced researcher as a mentor, having access to ongoing training in research and other skills, e.g. computer and internet use, having resources such as books and internet access, having time during work to undertake research, and having support in workplace.

Conclusion: Despite some introductory integration of research knowledge and skills into undergraduate midwifery curriculum and a perception by graduate midwives that research is important it does not translate into graduate midwives professional practice. Bachelor of Midwifery curricula must increase the amount of time spent on research content which must be taught in practical ways and by experienced educators so students are inspired and skilled to undertake research.

The barriers need to be acknowledged and organisational changes made to enhance the opportunities for graduate midwives to undertake research. This includes ongoing training and skill development following graduation, mentoring and support by experienced researchers and organisational commitment including time allocations for research.

Key words: Barriers and enablers of research, low- and middle-income countries, midwifery research, Papua New Guinea, research capacity building

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BACKGROUND

Research is fundamental in improving health through informing health practices and policies[1]. To facilitate quality research, national health research systems require national policies with priority-setting mechanisms and strong regulatory frameworks, leadership, well-equipped research institutions, adequate funding, information systems, dissemination plans and a capable research workforce.[1] Despite significant capacity building in some areas to support health research efforts, research capacity in low-middle countries (LMIC) is weak.[2] While strategies at a national and institutional/organisational level can increase research capacity in LMICs, to be sustainable health research must also be addressed from the bottom up, by training health workers who work closely with the population.[3] Research capacity must be strengthened within the health disciplines with the aim of health workers undertaking more high-quality research globally.[4]

Papua New Guinea (PNG) is a LMIC and is rated 154 out of a total 188 countries on the Human Development Index.[5] It is one of the most culturally diverse countries in the world with an estimated population of seven million people consisting of more than 800 language groups. Most of the population live in rural areas and rely on subsistence farming, with less than 20% living in urban areas. The reported adult literacy rate is 64 %.[5] Complex socio-economics circumstances and poor health outcomes make PNG a challenging country in which to conduct research.[6]

In 2006, PNG had the second highest maternal mortality ratio in the Asia Pacific region with 733 women dying from pregnancy-related causes for every 100,000 babies born alive. [7] Twenty-four PNG babies died, within 28 days of birth, per 1000 babies born alive in 2015. [8] PNG's health facilities include provincial and rural hospitals, health centres, sub-health centres and aid posts which are expected to be able to manage pregnant, birthing and postnatal women and newborn babies. Doctors are rarely seen outside hospital settings. Health centres and sub-health centres may be staffed by health extension officers, nurses who may be also midwives, and community health workers, and aid posts are generally staffed only by community health workers. One reason for the high mortality rates was the lack of skilled midwives in the country.[9]

In 2010 a revised Bachelor of Midwifery curriculum was implemented in four institutions educating midwives across PNG. It consisted of 18 weeks of theory and 32 weeks of clinical practice delivered over two semesters. Students undertook a theory subject called Public Health and Reproduction, where the concept of research was introduced. Since 2012, University of Goroka (UOG) students produced a research proposal that was relevant to their own work context with the aim of implementing the research project when they returned to their place of work as midwives. Despite students being very enthusiastic about carrying out the research during the development of their research proposal, after graduation there was limited evidence of them being able to successfully undertake the research. Understanding the barriers perceived by the graduate midwives to performing research in their own setting is important for development of strategies that will support the students and graduates in their research efforts in the future.

Research aims

The aim of this study was to identify the barriers to the integration of research into graduate midwives' professional practice in the Highlands of PNG. The objectives were to explore:

1. How is research perceived by graduate midwives working in the Highlands of PNG?
2. What factors make it difficult (barriers) for graduate midwives to conduct research in their local settings?
3. What factors would assist (enablers) graduate midwives to conduct research in their local settings?

METHODS

Design

An exploratory, descriptive study was conducted using a qualitative approach.

Setting, study population and sampling

A non-probability, purposive sampling approach was utilised and participants were selected based on particular criteria.[10,11] Criteria included having graduated from the Bachelor of Midwifery programme at UOG between 2013 and 2016 and now practicing in the Eastern Highlands Province (EHP). Of the 109 graduates in 17 provinces, 32 were practicing in the EHP. Midwives practising outside the EHP were excluded. Midwives in the province may be employed within the obstetrics and gynaecology unit at the Eastern Highlands Provincial Hospital, at Kainantu District Hospital, at one of three urban clinics in Goroka, in one of the district health centres or sub-health centres, or as educators at the Highlands Regional College of Nursing or UOG.

Graduates were contacted by a former midwifery educator or the UOG Bachelor of Midwifery course coordinator and asked if they were interested in participating in the study. Information was also posted on the UOG Midwives Facebook closed group page.

If the graduate agreed to participate an interview was arranged. Thirteen graduates agreed to participate however at the time of the interviews two were unable to be contacted by phone, one did not have enough reception to carry out the interview and one phone interview recording was impossible to transcribe, which left nine participants in total for the study.

Of these nine participants eight were female and one male. Their ages ranged from 30 to 46 with a mean age of 37.8 years. Three of the participants were working in a hospital setting caring mainly for pregnant, birthing and postnatal women and neonates. Two participants were working in rural health centres as both nurse and midwife providing antenatal, birthing and postnatal care for women and babies, as well as general health care for the entire community. One participant was working in an urban health centre providing antenatal, postnatal and family planning care for women and child health services, as well as general health care in the community. Three participants were employed as educators, one of nursing students and two of midwifery students.

Data collection

Data was collected through semi-structured interviews. Interview questions were developed following a review of the literature on research capacity building including barriers and enablers within health professions globally.

The initial set of questions was piloted on two PNG midwives, one of whom had been a former midwifery educator and one a UOG graduate. Minor changes to the wording of the questions

Table 1: Semi-structured interview guide

Demographic data:		
How old are you?		
What year did you graduate from the Bachelor of Midwifery at the University of Goroka?		
Where do you work now?		
What is your position?		
Research questions:		
What is your understanding of what research is?		
What is the purpose of doing research?		
What steps or actions do you think are important when planning to do a research project?		
What skills do you think you have to carry out research?		
Can you tell me about any research you have done since graduation?		
Has performed research:	**OR**	**Has not performed research:**
Why did you want to do this research in your workplace?		What are the reasons you have not undertaken research?
What were the factors that helped you conduct this research?		What made it challenging or hard for you to perform the research?
What made it challenging or hard for you to perform the research?		What do you think you would need to help you perform research?
Do you plan to do more research in the future? Why or why not?		

were made. **Table 1** shows the semi-structured interview guide.

Interviews were conducted by two researchers (JC, PP) in December, 2016. JC is an Australian nurse and midwife who worked at UOG from 2012 to 2016 as part of an Australian Government funded project to build the capacity of midwifery educators in PNG, and PP is a Papua New Guinean nurse and midwife who has co-ordinated the Bachelor of Midwifery programme at UOG since 2012. PP conducted four face-to-face interviews and JC conducted five interviews by phone. The interviews were recorded with the consent of the participants.

Analysis

All interviews were transcribed verbatim and thematically analysed by one researcher (JC) using Braun and Clark's six stage approach.[12] During this process pieces of script were analysed to identify meaningful words and phrases. Themes emerged following multiple readings and summarising by the researcher. Two researchers (PP and SD) also read the transcripts and comparison of themes was made between researchers to enhance rigour and credibility. Any differences in interpretation were discussed between the researchers to achieve a consensus interpretation.

Table 2: Themes and sub-themes

Themes	Sub-themes
Perception of research and its purpose	• View of research as a skill set • Tool for problem solving and improving practice • Create evidence including local evidence
Participants confidence to perform research	• Not confident - do not understand research process, lack of knowledge and skills despite learning at UOG, interested to practise what learned, • Confident – in limited skills, started but did not complete
Perceived barriers to research	• Time • Support in workplace • Resources • Culture of workplace
Perceived enablers to do research	• Experienced researcher to mentor • Ongoing research training • Other ongoing training – computer, internet, communication • Resources – books, internet • Time at work • Support in workplace

Ethics Approval

Approval for the conduct of this study was granted by the UOG Ethics Committee (2015018) and the James Cook University Human Ethics Committee (H6687). All participants were provided with an information sheet prior to the interviews and were informed of the voluntary nature of their participation and their ability to withdraw from the interview at any time. Consent to participate was confirmed at the beginning of each interview.

RESULTS

Analysis of the responses to the interview questions identified four main themes: the participants' perception of what research is and its purpose, participant's confidence to perform research, perceived barriers to research and perceived enablers to performing research. **Table 2** summarises the subthemes identified within each theme. Results will be described under those themes.

Theme 1 – Perception of research and its purpose

Participants identified a range of specific skills required to perform research and described their perceptions of the overall purpose of research. Research was viewed as a practical activity consisting of core elements including identifying a topic, identifying a target group, identifying

collaborators or partners, selecting a particular geographical location, doing a literature review, getting consent from management or an institution, deciding on a method, making questionnaires, getting consent from the population, collecting data and writing. Some described the relevance of identifying who would benefit from the research. One participant suggested,

> *"identify … actual topic itself, what I want to research on, and then … how I will conduct that research. Whom I will involve in and what sort of methods or ways of doing the research and who is going to benefit from that research?"*

Research was perceived as a positive undertaking that could result in outcomes such as an increase in women attending a health facility for a supervised birth, a decrease in the number of newborn babies being admitted for pneumonia and an improvement in routine postnatal care. Relevance of the research topic to the workplace and clinical practice was discussed as important. Research was viewed as a way of examining existing practice to come up with recommendations to implement new or better ways of practising. This could be by examining an existing or increasing clinical problem and finding an appropriate solution. As an example, one participant was concerned about the large number of teenage girls with unplanned pregnancies.

> *"We had this large number of mothers coming for delivery that are teenagers … so we are trying to make this ... research to see what we can do … with health educations for these young ones of school age."*

Another participant had identified the general lack of routine postnatal care for women and newborn babies in health facilities in PNG and proposed the use of research to add depth of understanding of this gap in care.

> "*For an example … postnatal care of women after delivery and … checking out or examining if postnatal care has been carried out by nurses and so forth."*

The importance of research to achieve change was expressed. Participants discussed how research can bring change and improve clinical care of patients to improve patient outcomes.

> "*We do research to … make changes or … when we are not happy with the result we do research to see good result, in the future."*

A number of participants discussed the use of research to generate evidence to support clinical practice. The importance of generating local evidence was identified with one participant stating,

> *"In PNG research is not done a lot and we don't have a lot of information about PNG and all this so it's good to have research done, so that we should have some information written."*

Theme 2 - Confidence in research

While many of the participants expressed interest in undertaking research and had even planned or started, none of the midwives in the study felt confident in their capacity or ability to undertake a complete research study. Those who had started doing some research had mainly collected data but did not have the confidence to analyse or interpret the data. Participants felt they did not have sufficient knowledge and skills to perform research, with some stating that they had forgotten what was taught during their midwifery studies. Some participants described a lack of confidence in knowing how to start the research or what steps were involved in doing research.

> *"I tried to do one but … I'm not really … confident in doing research on my own."*

One participant identified the short time that was devoted to teaching and learning about research in the Bachelor of Midwifery programme and said,

> *"I think we need more time on that … when we were up at the school the timeframe was short … for me it was a very new thing so it took a while for me to catch up."*

Some participants expressed confidence in developing a hypothesis, gaining participant consent, conducting interviews and report writing. However, one participant who had collected interview data was *stuck* on the analysis. Despite lacking confidence to analyse data this participant was already planning to do another study to address a problem in the community stating,

> *"if the … research project I'm working on is successful then I have another plan to do*

> *… another research regarding the antenatal women. More women are attending antenatal clinic but … for deliveries they don't come to the centre, they deliver at home, unsupervised."*

Another participant expressed confidence in collecting data when directed by a colleague, *"(we) decided to help her … it would be nice to go with her you know just practice what we were taught at the school*." When the colleague left the workplace the participant had no confidence to proceed without direction.

Having ready access to the research target group allowed one participant to collect the data for a study. The data was collected from the 2016 cohort of Bachelor of Midwifery students about their experiences of providing routine postnatal care in their previous work places. The participant explained,

> *"the … students were there … I could get all the information, receive the questions or whatever I was using to get the information from, it was easy … because they were there and they were nurses who they have been working assisting in deliveries where they came in to do their midwifery so that was an easy one for me to get from their own experiences*."

Despite data collection being complete this participant was not confident to undertake analysis.

Theme 3 - Barriers to research

A lack of time at work and at home was the most common barrier which made undertaking research difficult. Participants discussed their heavy workload which included clinical and administrative duties. One example was being periodically taken out of the clinical area to perform administrative tasks leading to less time in the health facility.

> *"most of the time I was at the centre for two to three weeks and then I went out to town to help with the administration work … so that's the thing that pulls me out to really concentrate on my research."*

Failure to prioritise research within a work schedule was also seen as a barrier to undertaking research and participants felt there was little opportunity after work hours to do research. Women are expected to manage the house and children as well as work fulltime. One participant stated, "*a lot of work and by the time in the afternoon … when I get home I have a lot of home duties to do."*

Lack of cooperation and support from colleagues and management was also described as a barrier to performing research. Participants felt colleagues and managers did not understand research and therefore were not interested or supportive of any plans or efforts to perform research. They were also seen, at times, to be obstructive to new ideas or change.

> *"The people there has to be very supportive, like the administration and that in the work that I want to do … sometimes they want to stay in the areas of the old ways of doing things and doing new things that I have learned, I want to implement and work on … I'm stuck on the way."*

Midwives also discussed difficulty of obtaining ethics approval for research and consent from their management to perform research in their workplace. Although it was possible to obtain ethics approval through the UOG ethics committee, participants were unaware of any other avenues for obtaining ethics approval and sometimes were not aware of where to go to obtain permission to perform research within their own organisation. A participant working in a remote health centre stated, "*everything I prepared, my topic was on gestational diabetes but the problem I have is … where to get the ethical approval."*

A lack of resources including electricity, laptop computer, smartphone and internet (personal or work related) were identified as barriers to performing research. One participant living and working in a small village stated, "*because of blackout I don't have my computer very often because not enough power. Sometimes when it is off we don't touch it and it stays like that."* Lack of a smartphone as the main access to the internet and a lack of reference books were commonly identified as barriers.

> *"One of the reasons is … resources, … I'll have to … understand what the research is all about, meaning I have to go to … books and … internet is one of those things that can also help me to really find out and then … I can start working on that."*

Some participants stated they simply forgot about doing any research once they had returned to

their place of work. Research was not viewed as part of workplace culture and as such became less visible and less of a priority.

Theme 4 - Perceived enablers to do research

Having a mentor, adviser or supervisor to support and encourage research was described as an enabler. Suggestions of appropriate mentors included their course coordinator or another academic from UOG. One participant suggested that staff from the PNG Institute of Medical Research would be appropriate. The importance of the person being senior and experienced in research and actually being with them during the research processes was emphasised. One participant stated, "*it needs time and someone with that interest to come in and push us. Cause we are interested."*

Ongoing training and refresher courses in research was a significant enabler described by participants, with the workplace identified as a suitable venue for such courses. Potential content areas for training included identifying a topic, forming a hypothesis, writing a literature review, planning a research study, deciding on a method and target group, formulating a questionnaire, collecting data using a questionnaire or by interviewing participants, analysing data and writing a report. The importance of administrators and managers undertaking research training was discussed and it was felt this would improve their support for overall research efforts.

Participants stated a lack of skills related to reading and communication but did not elaborate on these deficits. They also described the need to improve other skills related to the use of computers, computer software and the internet. One stated, "*I need skills like basic computing, especially on how to enter datas into spreadsheet and all that, and also a little bit on the research itself."*

Access to resources while previously mentioned as a barrier, was also an enabler. Midwives stated that in order to perform research they needed more resources in the form of books and the internet and in order to access the internet they require a smartphone.

Providing time during working hours was a major factor in being able to perform research. One participant stated,

> *"if the bosses could … give us some time in between instead of just letting us see the patients every day … just a … little bit of free time for us to do something else."*

Having support from line managers, other management and administration was viewed as an enabler for research. One participant identified the possibility of collaborating with UOG to get ethics approval for research so that consent could then be sought from the relevant provincial health authority in order to perform research.

DISCUSSION

Building research capacity in LMICs such as PNG is important in improving health outcomes and some progress has been made in this area. The Health Research Policy was published in 2012 by the PNG Department of Health and there is a National Health and HIV Research Agenda 2013-2018 which details research priorities in PNG. Seven of the 20 top priorities of the agenda relate to maternal and child health and are relevant to midwifery practice.[13] PNG has a very active government supported Institute of Medical Research performing health research throughout the country and a number of universities performing research. Despite the national agenda and research being included in nursing and midwifery curricula this study shows that midwives experience a number of barriers in practical terms in trying to incorporate research into their practice. While participants generally viewed research as a positive activity that could be used to increase knowledge, problem solve and bring about change, there was a lack of confidence to carry through a research study to its conclusion.

Time constraints for research

Lack of time for research was a barrier identified by participants in the current study. This has also been identified in other studies. Ekeroma, Kenealy, Shulruf, McGowan & Hill undertook a study where 96% of a group of 28 Pacific Island health workers, including nine nurse/midwives, undertaking research training in New Zealand, identified lack of time as a barrier to doing research. 54% of those studied also described time for research as a motivator or enabler to performing research.[14] This issue is not limited to LMICs with studies in the United Kingdom and

Australia showing health professionals also lack time to incorporate research into their work.[15,16] The Australian study identified that having dedicated time for research at work was viewed as an enabler to performing research. [16]

Support in the workplace to undertake research

Lack of support in the workplace from colleagues, administration and management was also a barrier that PNG study participants had in common with health workers in other Pacific Islands and those in more developed countries.[14,15,16] Motivators and enablers suggested in these studies included being encouraged to perform research by management, having colleagues undertaking research and having research as part of their role descriptions. The ability to advance their career through performing research was also stated as a motivator for undertaking research. [14,15,16]

Resources required for research

The lack of resources identified as a barrier to research is not surprising given the lack of infrastructure, such as a reliable electricity supply, in PNG. A number of participants discussed the difficulties of charging a laptop, including in a small village where they relied on solar or generator power. Although not specifically identified in other studies, lack of electricity is likely to be an issue in other LMICs countries.

While student midwives had some access to computers and internet while studying they have very little access in the workplace. Few workplaces in PNG provide internet access and most people access the internet via mobile phones at significant cost. Some parts of PNG still have no or limited mobile phone coverage[17] and, when available, internet access can be slow. Surprisingly this also appears to be a concern in high income countries with over 10% of government employed health worker participants in an Australian study identifying internet access as a barrier to performing research.[16] A lack of computer software was described as a barrier by 64% of Pacific Island health professionals in the New Zealand study described previously.[14] No mention of software access was made by PNG participants, however they may have a low awareness that there was any specific software available to carry out research. Lack of internet access may be an issue in other LMICs, however as mobile phone coverage increases in PNG and elsewhere, prices of phones and digital access should decrease in the future.

Research and other education/training

Despite research being included in the nursing and midwifery curricula in PNG, study participants felt they had insufficient skills in research. The participants suggested that extra training is necessary to develop their research capacity and make them confident to complete a research study. Similarly a lack of research knowledge, skills and education has been identified as a significant barrier in other studies. [14,15,16,18] A number of strategies have been suggested to provide health workers with these skills including through graduate or post graduate courses, through linking with universities and through providing scholarships.[16,18] Opportunities for post graduate education for midwives in PNG are limited with few in-country courses and no masters level midwifery courses.[19] Bachelor of Midwifery graduates who want to continue to study have to compete for overseas places and scholarships in masters programmes.

Continuing professional development is one way that research knowledge and skills could be provided for midwives although currently there is little provided in PNG. In one study of a similar cohort of 138 recently graduated PNG midwives 58% had undertaken no training since their graduation. The other 42%, mainly working in urban hospital settings, had been involved in in-service sessions or case discussions on mainly clinical subjects. The participants reported no opportunities for short courses or other formal training.[19]

Training courses to build capacity in research are provided in many LMICs and by many organisations. Workshops such as one conducted in New Zealand for health workers from five different Pacific Island nations are often utilised. This workshop included seminars, lectures and group work over six days, as well as ongoing mentoring. Unfortunately, the article did not report on whether the participants had gained more knowledge and skills by the end of the training.[14] "Learning by doing", including training and mentorship, has been recommended as an

approach to building research capacity of individual researchers in LMICs.[20] This approach has been utilised by a team of Australian and Solomon Island researchers who ran a four-day workshop in 2014 with 67 participants including health workers and community members. At the end of the workshop participants reported increased knowledge, confidence and motivation to undertake research. [21]

Funding for research

Funding has consistently been described as a barrier and enabler for performing research.[14,15,16,19] However, it was not raised by the participants in this PNG study. The research studies planned by the students during their midwifery education involved clinical issues, and were small and manageable within the workplace and with minimal cost. Examples of other types of research that do not necessarily require funding include literature reviews, audits, and case studies,[3] all of which could be undertaken by PNG midwives.

Mentorship

There was consistency in the literature regarding the value of ongoing mentorship to build research capacity[14,16,18] and having a mentor was identified as a significant enabler for participants in the current study to performing research. Mentoring structures available in more developed health research systems such as research practicums, journal clubs and internships[18] are not currently available to midwives in PNG. UOG Bachelor of Midwifery staff or senior midwives in the community would be appropriate mentors for graduates if they possessed adequate research knowledge and skills.

Limitations

At the inception of this study two of the researchers were based in the EHP. As travel is difficult and it was planned to collect all data in face-to-face interviews, sampling was originally limited to within the EHP. Subsequently one researcher (JC) returned to Australia and, in order to be compliant with the research protocol/ethics, only graduates in the EHP were approached, even though conducting interviews by telephone made graduates in other provinces accessible. This study was limited by the small number of participants interviewed within one province and may not be representative of all midwives in PNG. Of those midwives interviewed however there was consistency in the themes identified.

The interviewers had taught within the midwifery course and were well known to the participants. In some ways this was a strength of the study but could have been a limitation as participants' responses may have been influenced by not wanting to disappoint their former educators.

Mobile phone coverage in PNG is patchy and getting through and staying connected from Australia was an issue. Two midwives who consented to be interviewed did not answer their phones and another who consented was in a remote village where the reception was not sufficient to carry out the interview.

English is not the first language of participants and they may have had difficulty expressing their ideas in English. They may have responded differently to the English-speaking interviewer (JC) than to the Tok Pisin speaker (PP). Even though questions were in English, sometimes the participants answered in Tok Pisin, and some answers were difficult to understand from the recording.

A further limitation was the self-selection of those who agreed to take part. Participants in the study may have been more motivated due to interest in the area and results may reflect this. Further exploration of attitudes of midwives across PNG would have added more depth to the study.

CONCLUSION

Research methods, ethics and the importance of research must be included within curricula of all health science students in order to increase the number of health workers who are able to undertake research.[22] Despite integration of research knowledge and skills into undergraduate midwifery curriculum and a perception by graduate midwives that research is important it does not translate into graduate midwives professional practice in the EHP. Whether this is the situation across all areas of PNG requires further research.

The 12-month Bachelor of Midwifery curriculum was reviewed in 2014-2015 and an 18-month curriculum, to bring it up to a global standard,[23] was recommended and approved by the PNG

Nursing Council. This longer course was implemented by UOG in 2017 and a positive outcome is that it allows time for students to perform a small clinical research project. This will potentially equip them with more comprehensive and applied research knowledge and skills. Research on the impact of these changes at UOG is required and could be used as a basis for encouraging the other four institutions educating midwives in the country to expand their course to 18 months. Having an 18-month curriculum provides an opportunity for research content to be taught in practical ways, with enough time dedicated to the content and supported by experienced educators so students are inspired to undertake research.

The realities of barriers to undertaking research in LMIC such as PNG need to be acknowledged (e.g. time, competing clinical priorities, workload, lack of confidence in the knowledge and skills, lack of mentors and lack of managerial, organisational and broader staff support, internet restrictions) and further to curriculum changes, organisational changes are recommended to enhance the opportunities for graduate midwives to undertake research. This includes ongoing training and skill development following graduation, mentoring and support by experienced researchers and organisational commitment including time allocations for research.

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