



Research article

Integration of preconception care into the bachelor of nursing curriculum: An exploratory qualitative study

Winifred Chinyere Ukoha^{*,1}, Ntombifikile Gloria Mtshali¹

School of Nursing and Public Health, University of KwaZulu-Natal, Durban, South Africa



ARTICLE INFO

Keywords:

Nursing curriculum
Preconception care
Integration
Provision
Preventive service
Document analysis

ABSTRACT

Background: The significance of ensuring high quality of care has become apparent in nursing and midwifery education worldwide, especially in low- and middle-income countries. This has led to upgrades of the nursing curriculum to include several aspects of care that have been overlooked with recent evidence-based care.

Objectives: To explore the integration of preconception care (PCC) into the Bachelor of nursing curriculum in South Africa.

Design: An exploratory qualitative study.

Setting and participants: This study was conducted in a higher education institution in South Africa that has recently revised its Bachelor of nursing curriculum. Data sources were Bachelor educators and program documents.

Methods: Individual in-depth interviews were conducted among ten nurse educators. Interviews were complemented with an analysis of the curriculum documents for the Bachelor of nursing program using the BEKA (benchmarking, evidencing, knowing, and applying) model of curriculum analysis and evaluation.

Findings: Benchmarking and evidencing of the Bachelor of nursing curriculum reveals a high level of compliance with the externally set standards. Both data sources pointed to some degree of incorporating the preconception care concept into the curriculum. The educators perceived that for full integration to occur, preconception care should be taught as a standalone topic. Lack of focus and poor perception was further reported as barriers to introducing the concept. Most preconception care components and services were taught to students throughout the four hundred levels of the nursing program, especially in the sexual and reproductive health module. Gaps were noted in female genital mutilation, mental health, environmental health, preconception vaccination, and other aspects where preconception care needs emphasis.

Conclusions: There has been a high level of integration of preconception care competency in the Bachelor of nursing curriculum. Especially in the sexual and reproductive health module, most preconception care components are taught to students. However, there is a need to emphasise the preconception nursing management of women with certain conditions. To ensure nurses' role in providing health for all, safeguarding reproductive health, and maintaining the health continuum is enhanced.

Abbreviations: PCC, Preconception care; BN, Bachelor of Nursing; SANC, South African Nursing Council; SRH, Sexual and Reproductive Health.

* Corresponding author.

E-mail addresses: winifredchinyere@gmail.com (W.C. Ukoha), mtshalin3@ukzn.ac.za (N.G. Mtshali).

¹ University of KwaZulu-Natal School of Nursing and Public Health Howard College Durban, 4001 South Africa.

<https://doi.org/10.1016/j.heliyon.2023.e13304>

Received 2 October 2022; Received in revised form 24 January 2023; Accepted 27 January 2023

Available online 28 January 2023

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1. Introduction

Recently, the significance of Preconception care (PCC) in the continuum of care has been recognised in lower- and middle-income countries. The United States Centres for Disease Control and Prevention (CDC) and World Health Organisation (WHO) made recommendations for the improvement of preconception health and care [1,2]. Preconception care interventions comprise a package of promotive, preventive, and curative health interventions that effectively improve maternal and child health [3]. The proposed package of effective interventions aims to address some health problems, behaviours, and risk factors in the preconception period, increasing maternal and childhood mortality and morbidity likelihood. Therefore, based on the above recommendations, there is a need to upgrade the nursing curriculum to that effect. There is limited literature on the integration of PCC into the nursing curriculum. Therefore, this study aims to explore the integration of preconception care into the recently updated Bachelor of nursing curriculum in South Africa.

2. Background

According to the International Confederation of Midwives (ICM), competency for midwives, the role of midwives and nurses starts right before conception occurs and continues along the health continuum [4]. A basic midwife's competencies include providing pre-pregnancy care by identifying and reducing barriers to accessing sexual and reproductive health services, assessing nutritional and immunization status, including health behaviour, existing medical conditions, and exposure to known teratogens. The ability to carry out screenings for Sexually Transmitted Infections (STIs) and other infections, including Human Immuno-deficiency Virus (HIV) and cervical cancer, provide counselling on nutritional supplements, nutrition, immunization, prevention of STIs, and family planning [4]. WHO also identified as part of capacity building to plan, implement and monitor PCC to identify opportunities to incorporate in-service, pre-service training and distance education [2].

A Netherlands study reveals that most professionals' education falls short of PCC [5]. A study from Nigeria pointed out that most healthcare professionals are not trained to provide PCC services. However, many still offer the services without formal training or education [6]. A study among midwives reported their level of PCC education to be high. Other healthcare providers generally lack the necessary knowledge for PCC as their formal professional education was deficient in this area. Therefore, the need for a refresher course and investment in the workers' education was proposed [7].

In the Netherlands, communication and interviewing skills were advocated to be included in the educational courses rendered to the healthcare professionals to provide PCC, as many are timid and reluctant to discuss the desire to conceive with women [7]. Genuis and Genuis [8] also advocated for the environmental health education training of all the healthcare professionals taking care of women of reproductive age. To ensure that the necessary environmental and lifestyle modification advice is given to women. Biratu [9] recommended that improvements in PCC implementation provisions be made for in-service training of all healthcare providers, for pre-service training students, revision and integration of PCC in the curriculum for healthcare providers, and training of both teachers and policymakers on PCC. A study from Scotland promoted the inclusion of PCC in the school curriculum of healthy relationships, sexual health, and parenthood preparation delivered to students to ensure coverage [10]. An Iranian study recommended that for improvement of preconception services, there is a need for an upgrade of knowledge, preparation, and training of all the people responsible for maternal and child health services [11].

A systematic review revealed a lack of knowledge of PCC on the side of the health care providers, which relates to how it should be rendered as a barrier to implementation and provision of PCC [12]. A study among primary care nurses in the USA shows inadequate training of health care providers about preconception health assessment and promotion skills as barrier to providing PCC [13]. Holleran [14] created an educational module for healthcare providers, which included background information, relevant research, and guidelines for discussing PCC information with patients. A study was conducted in the USA to assess the effect of educational curriculum, specific instructions about using a Reproductive Life Plan (RLP), and provision of counselling, intervention, and referrals on clinicians' knowledge and delivery of PCC. The result after a post-test revealed increased knowledge about PCC among providers, increased use of RLP tools to screen for reproductive intentions, and an elevation in the number of women receiving PCC [15]. To provide a PCC program for the general population, preconception health should be part of the healthcare professionals' curriculum. It should form part of their pre-licensing programs, specialty and in-service education [16].

Although the South Africa Nursing Council postgraduate qualification in midwifery and bachelor's degree qualification framework mentioned the preparation of a woman and family for pregnancy, however, it did not include anything related to PCC provision in the postgraduate primary health care framework [17–19]. There are also no policy guidelines for the PCC provision in South Africa, the importance of pre-pregnancy preparation for women and families is stipulated in the maternity care guidelines [20]. Nevertheless, a recent study on PCC provision in South Africa identified the need to revisit the PCC trainings of healthcare workers [21].

2.1. The conceptual framework

This study adapted the BEKA model of curriculum analysis and evaluation to scrutinise the PCC content of the Bachelor of Nursing (BN) curriculum. The BEKA model comprises benchmarking, evidencing, knowing, and applying [22]. BEKA framework of curriculum assessment was used in this study to assess the integration of PCC in the undergraduate nursing education program. Curriculum assessment is an evaluation process of the nature, impact, and importance of a curriculum performed by methodical data collection, analysis, and data interpretation for decision-making [22]. This assessment aims to analyse the entire or parts of the curriculum to

identify areas for enhancement. Document analysis is a systematic process of assessing and interpreting printed and electronic material to gain understanding [23]. Hall [22] proposed a four-step method of curriculum analysis called the BEKA framework, which comprises benchmarking, evidencing, knowing, and applying. Integrating PCC into Bachelor of nursing education and preparing the nurses for PCC provision has become paramount in addressing the preventable causes of maternal and child mortality. The role of PCC assessment in reducing maternal and child mortality and morbidity depends on the extent it is integrated into the course objectives, content, assessment, and the translation of theory to practice in the clinical areas [24]. Table 1 shows the utilization of the BEKA model process to analyse the integration of PCC in the BN curriculum.

3. Methods

3.1. Study design and participants

A descriptive qualitative design was used to explore the integration of preconception care into the recently updated Bachelor of Nursing (BN) curriculum. Ten nurse educators and the BN curriculum were the data sources used in this study. A purposive sampling method was used to select the educators and the curriculum. Inclusion criteria for the educators are being involved in the BN teaching and learning for over a year or being part of the curriculum development team. These data sources were selected considering their ability to provide the required information integrating preconception care into the recently updated BN curriculum. Table 2 presents a summary of the methodology.

3.2. Context and settings

The program is based on directives from the Department of Higher Education and Training and the South African Nursing Council (SANC). The latter is the regulatory body and Quality Assurer of all nursing education and training. Each nursing educational institution has an institutionalised curriculum for different programs per the program's SANC competency framework. This curriculum stipulates the requirements and goals to be met at the end of the training. The SANC oversees and regulates nursing education institutions and activities in South Africa in accordance with the Nursing Act of 2005 [25]. In BN Education, nurses are exposed to all the clinical aspects of nursing, including midwifery. Each nursing education institution is accredited and monitored by SANC.

The selected nursing education institution runs both undergraduate and postgraduate nursing education programs. It is situated on the Berea ridge above the city of Durban on the northern side overlooking Durban harbour on the coast of KwaZulu-Natal province [26]. The Bachelor of nursing degree program runs for four years, after which the graduate nurses can be registered with the professional body for practice as professional nurses. Each level of study admits approximately 80–100 students.

3.3. Data collection

Individual in-depth interviews were conducted among nurse educators to get a more comprehensive view of the integration of preconception care into the recently updated Bachelor of nursing curriculum [27]. Data were collected between February 2021 to February 2022. The educators were approached, the research aim and objectives were explained, and their participation was requested. The nurse educators were recruited by invitation through emails. The interviews were scheduled on the day and time convenient for the educators and were conducted through Zoom meetings. The first author, a Ph.D. student, performed the audio-recorded interviews. Each interview lasted between 25 and 50 min. Some of the open-ended questions asked include “Is PCC included in the course content for nurses?” “Perceptions about PCC as a core content for nursing training” “Are there any challenges to teaching this concept to students” and “What affects teaching and learning of PCC” “How to improve teaching and learning of PCC.”

The curriculum documents, which include the program template, module templates, study guide, clinical workbook, and

Table 1
Using the BEKA model to analyse the integration of PCC in the BN curriculum.

| BEKA Model | Denotation | Data sources and methodology | Answered question |
|--------------|--|--|---|
| Benchmarking | The curriculum is compared against the professional body's standards | Content analysis of SANC BN guidelines and WHO PCC package to identify the required skills | Does the BN curriculum match the SANC guidelines? |
| Evidencing | Data are further assessed in relation to objective and content mapping | Content analysis of the BN curriculum against the benchmark | Are the texts in the BN curriculum congruence with the WHO PCC package? |
| Knowing | A deeper understanding of the content is sought through the interviewing of stakeholders | Interviews of nurse educators and curriculum developers for more information to corroborate information from the content analysis of the curriculum | Is the PCC concept delivered to students supported by the written curriculum? How can PCC be effectively taught? |
| Applying | Applying seeks to understand what students know and apply | Nurse educators were interviewed on components, null curriculum, and taxonomic level of assessment. Knowledge of students was surveyed because the curriculum is not yet fully implemented | How is a null curriculum avoided? Do the planned assessments match the objective? |

Adapted BEKA process of curriculum analysis (Hall, 2014)

Table 2
Summary of study methods, data source, and interview themes.

| Data collection method | Data source | Interview/content themes | Structural level |
|------------------------|--|--|--------------------|
| Individual interviews | Nurse educators and curriculum developers (n = 10) | Preconception care integration and perceptions Where PCC is taught | School Program |
| Document analysis | BN curriculum document R174 SANC BN guidelines | Factors affecting the teaching of PCC PCC services and components in the curriculum Where PCC is taught Which PCC services were supposed to be included | Program Program |

assessment tools, were accessed through the program and academic director of the school in August 2021. The curriculum documents were read several times, and essential information regarding integrating preconception care into the BN curriculum was retrieved following document analysis steps [23]. A document analysis was conducted on the BN curriculum to assess the content of the curriculum about preconception care provision. The document analysis of the curriculum was carried out to complement and triangulate the findings from an in-depth interview with nurse educators. The BN curriculum was analysed, and the BEKA framework guided content extracted from the documents. This curriculum was selected because general practitioners and midwives have been indicated to be more suitable for the provision of preconception care [5,16].

3.4. Data analysis

Audio-recorded interviews were analysed using thematic analysis steps [28]. These include getting familiar with your data, generating initial codes, searching for themes, reviewing the themes, defining and naming themes, and producing a report. Transcripts were sent to participants for correction to maintain the accuracy and credibility of the findings. Interviews were transcribed verbatim, and transcripts were read several times while noting the ideas for the authors to gain familiarity with the data. Transcripts were then exported to Nvivo version 12 for organisation, coding, and analysis. Coding was performed by the first author and another Ph.D. student. Initial codes were generated and collated, and all codes were searched for potential themes. The themes were further cross-checked with coded extracts by the study supervisor and then refined and named accordingly before the final report of the analysis.

The content of the curriculum was analysed following the document analysis steps by Bowen [23]. Data from interviews were used to check data from documents in the same way information from records leads to probing questions. The authors reviewed phrases, sentences, and paragraphs from the curriculum documents. Initial coding of the documents was generated then a constant comparative method based on an inductive approach was used to discover patterns. In a back-and-forth interplay, the primary codes were checked and rechecked. Data were scrutinised and compared to organise and cluster them as themes and subthemes. These themes and subthemes were compared across both documents for similarities and differences. Codes across both data were re-analysed in the presence of a new theme or subthemes. Therefore, in this study, the text document analysis findings are presented in categories of codes that emerged from the PCC content in the document. Two independent coders coded data (the first author and another Ph.D. student experienced in qualitative data analysis) the co-author verified it. Inductive content analysis was used to describe the content on a manifest level without much interpretation [29]. Standards for reporting qualitative research (SRQR) checklist was used to guide the writing of this qualitative study [30].

3.5. Rigor

Trustworthiness, a concept of ensuring authenticity and quality in a qualitative study proposed by Lincoln and Guba [31], is achieved through credibility, dependability, confirmability, and transferability [32].

According to Lincoln and Guba [31], credibility addresses the authenticity of the study findings to ensure that the results are true and accurate. In this study, credibility was ensured through member checks and triangulation. Lincoln and Guba [31], Sim and Sharp [33] suggested triangulation and member check as a strategy to ensure the trustworthiness of qualitative data. Triangulation was ensured in this study using two data sets. In contrast, member check was ensured by confirming the study findings with the participants as transcripts were sent back to them. Transferability was achieved through a thick description of their context and participant to enable replication of the study. Dependability involves study's evaluation, interpretation, and recommendation to ensure that collected data from the study participants support them. An audit trail that involves establishing that the findings are based on the participants responses and not the researcher's preconception was used by the co-author to ensure dependability. Confirmability was achieved by establishing that data and the interpretations of the findings are derived from the participants using direct quotes to ensure the objectivity of the study findings.

3.6. Ethical consideration

The University of KwaZulu-Natal Human and Social Sciences Research Ethics Committee (HSSREC/00001069/2020) and the KwaZulu-Natal Health Research and Knowledge Management directorate (KZ-202003-009) gave the ethical clearance for this study. Written informed consent was obtained from all the participants, and anonymity was maintained throughout the study.

4. Findings

4.1. Sociodemographic characteristics of participants

The nurse educators were all involved in lecturing and developing the BN curriculum, including the module guides. Their years of practice as educators range from three to 13 years. Seven educators have master's degrees as their highest educational qualification, while three are Ph.D. holders. The lecturers targeted teaches midwifery, community health, health promotion, primary health care (PHC), and SRH modules.

The presentation of the findings was informed by the BEKA framework, which guided the process of data extraction and analysis as follows.

4.2. Benchmarking

The curriculum was compared against the standard set by the nursing regulatory body. The concordance of the revised BN curriculum with the South African Nursing Council (SANC) standards, as shown in [Table 3](#) revealed that the curriculum under analysis complied with the prescribed standards. Preconception care, a policy directive from WHO, entails the biomedical, behavioural, and lifestyle health intervention provided to women and couples before conception, intended to improve their health status by reducing social and environmental factors that could lead to poor pregnancy outcomes [2]. Preconception care and its synonyms, such as pre-pregnancy care, inter-conception care, and its components rendered before pregnancy, were assessed. PCC components were evaluated while analysing the skills and concepts that should be emphasised.

4.3. Evidencing

During evidencing, a detailed evaluation of the curriculum was performed. The course objectives, content, and assessment were mapped to uncover evidence of compliance with the set standards. The course objective, content, and evaluation of each module in the BN curriculum were examined for PCC components or references to related issues.

Evidence from the document assessment revealed that PCC services were integrated into some modules in the BN curriculum. In the analysed curriculum, text phrases regarding preconception care were found in the sexual and reproductive health (SRH) module, which serves as an entry point to midwifery. In the SRH module, preconception care was mentioned six times, and other PCC service components were also targeted. Several texts indicated some PCC strategies and elements that should be provided. The midwifery module, although not substantiated, also mentioned that midwifery services should start at the preconception period by preparing a prospective mother and family for pregnancy. The same applies to the primary health care and community care modules. Some elements of PCC were included in general and health promotion modules without emphasis on the preconception care period. Presented in [Table 4](#) is a comparison of the PCC components covered in the reviewed curriculum and course contents with the proposed PCC components by WHO.

Table 3
Bachelor of Nursing Curriculum compared with SANC guidelines of BN program.

| Question | Bachelor of Nursing Curriculum | SANC guidelines of the BN program |
|--|---|--|
| Type of document | Curriculum R174 and related documents | Regulatory body qualification framework |
| What are the physical characteristics of the document? | Course content | Course guidelines |
| Date of the document | February 18, 2021 | July 23, 2014 |
| What audience was the document written for? | Educators, students, and the public | Educators, students, and the public |
| What are the main core areas of the document? | General nursing (general, community and psychiatry) and midwifery training | General nursing (general, community and psychiatry) and midwifery training |
| Who is the target group of the content? | Targets all individuals across the life span and continuum of care reproductive, maternal, newborn, and child health. | Targets all individuals across the continuum of care. |
| The focus of the document | Promotive, preventive, curative health, and development services | Promotive, preventive, curative health, and development services |
| Program/framework content | Learning outcomes, associated assessment criteria, and content outline | Exit levels outcomes and associated assessment criteria |
| Is there any mention of PCC or interventions or preparing women for pregnancy? | Yes | Yes |
| Is PCC or any of its synonyms mentioned in the document? | Yes | No |
| Is there anything mentioned in the course objectives, methods, or assessments in support of PCC? | Yes | Yes |
| Is there any PCC component addressed in the document? | Yes | Not specified |
| Was the PCC component assessed? | Not specified | N/A |

N/A indicates not applicable, as this is a guideline and therefore not detailed.

4.4. Knowing and applying

Under knowing and applying, the evidence from stakeholders' interviews was triangulated with the text information from 'evidencing.' Interviews were held with educators and curriculum planners to ascertain the planning process, assessment preference, perception, and linking of theory with practice. As seen in Table 5, theme 1, with its six subthemes, emerged from the two data sets: the extent of PCC in the Bachelor of nursing curriculum. The other two themes, with their five subthemes, emerged from the nurse educator's perceptions about teaching PCC only.

4.5. Theme 1. the extent of PCC in the bachelor of nursing curriculum

Both nurse educators and evidence from the document assessment highlight the inclusion of PCC in the curriculum for the training of nurses. This theme highlights the level of incorporation of PCC throughout the Bachelor of nursing curriculum, ways of ensuring consistency and planned assessment.

Evidence from the curriculum analysis revealed that PCC is integrated to a greater extent in the SRH module than in other modules. Participants also highlighted that PCC is included in some course content to help nurses appreciate the significance of intervening preconceptionally to avert complications that may affect pregnancy outcomes. Several components of PCC are taught to students in the community health nursing module; however, they lack emphasis on preconception period interventions.

"... PCC has been included in the course content of SRH and midwifery to enable students to realize how important PCC is for women and help them to know that we actually start providing care for women before pregnancy, not only after pregnancy."

"Not exactly, but the components are taught but not necessarily for preconception period. In the community, our students go out to the community to identify the gaps. What is it that the community needs most and intervention? That's where they now they talk about STIs, interpersonal violence, substance abuse, HIV, all those things which are there in the community."

The curriculum developers also revealed that the PCC concept delivered to the students is supported by a written curriculum and professional body's guidelines. They also highlight what is considered during curriculum development.

"The curriculum was developed based on the community's needs, SANC framework, and disease profile while ensuring that we cover the content to meet the objective and learning outcomes."

From the curriculum analysis, it was observed that several PCC strategies and activities were targeted in the SRH module in the

Table 4

Concordance of the components found in the BN curriculum and course guides with the WHO package of PCC interventions.

| Package of PCC interventions by WHO | Intervention for each package. (Each intervention can be provided as risk assessment, health promotion, and education or medical and psychosocial interventions) | Aspects included in the BN curriculum |
|---|--|--|
| Tobacco and alcohol use | Tobacco and alcohol cessation advice, pharmacotherapy, behavioural counselling | Lifestyle counselling |
| Genetic conditions | Genetic counselling, genetic risk assessment, treatment of genetic conditions | Genetic counselling |
| Infertility and subfertility | Screening, diagnosing, management, and counselling in infertility | Infertility, management of clients seeking gynaecological services |
| Interpersonal violence | Health promotion, screening, diagnosing, management, referral, and support for victims | Intimate partner violence, sexual violence against women |
| Too early, unwanted, and rapid successive pregnancies | Sexual and reproductive health education, contraceptive services, girl's empowerment, inter-conception care, reproductive life plan | Family planning sexual and reproductive health, managing adolescent and sexual reproductive health issues, adolescent reproductive health services |
| Sexually transmitted infections | Sexuality education, screening for STIs, increase access to treatment, and promotion of safer sex practices. | Adolescents and women's health, STIs screening |
| HIV | Family planning, promotion of safer sex practices, HIV counselling, and testing, pre-exposure prophylaxis, male circumcision, antiretroviral therapy, and PMTCT. | HIV management, family planning, safer sex, and protection |
| Psychoactive substance use | Screening, providing intervention, treating, pharmacological and psychological interventions for substance abuse. Reduction of substance abuse among adolescents and women. Family planning. | Lifestyle counselling |
| Nutritional conditions and supplementation | Anaemia, diabetes, folic acid, and iron supplementation, nutritional status, obesity, exercise | Nutritional assessment as part of general health promotion |
| Environmental health | Screening for environmental hazards, education, and health promotion. Occupational hazards. Review of teratogenic medications. | Not included |
| Mental health | Screening for psychosocial problems; counselling, treating, and management of depression; | Not emphasised |
| Vaccine preventable diseases | Rubella, tetanus and diphtheria, Hepatitis B | Only childhood immunization is included |
| Female genital mutilation (FGM) | Discouraging FGM, screening for FGM, detection of complication, access to treatment for the complication, early treatment of complications | Not included |

Table 5
Summary of emerged themes and subthemes.

| Themes | Subthemes |
|---|--|
| The extent of PCC in the Bachelor of nursing curriculum | Incorporation of PCC in the nursing curriculum PCC comprehensively integrated into the SRH module PCC, a recent addition to the midwifery curriculum Avoidance of null curriculum Linking of PCC theory with practice The planned level of assessment |
| Views about teaching PCC | PCC as a standalone topic Assessment on PCC |
| Barriers to teaching PCC | Students' preparation for PCC provision Poor perception about PCC Lack of focus on PCC |

curriculum. The module's description contains texts about PCC and service activities. These aspects of PCC components were projected in the module description of the third and the second level SRH module. It also contains some objectives regarding PCC concepts and family planning. This formed the basis for the probing questions for the educators. Responses from the participants revealed that PCC is given greater emphasis in the sexual and reproductive health module (SRH). The SRH is part of obstetrical and gynaecological care and acts as an entry point to midwifery.

"... it is well highlighted in sexual and reproductive health, which is part of the third-year modules."

Participants believed that PCC should be part of gynaecology training, which is well highlighted in the SRH module. The idea is that gynaecology modules deal with problems women of reproductive age encounter. Therefore, PCC as preventive care should belong there. Another reason given for lack of emphasis in the module is because women in their reproductive age, when not pregnant but require interventions are mostly seen in the gynaecology ward.

"In gynae module concentrate more on problems that might arise in women. Therefore, preconception care is covered under gynaecology. It is a gynaecology kind of thing."

"In the hospitals, sometimes the women who are presenting with abortions or early gynaecological issues would go to the gynae wards, so the general nurses should be more involved ... because more women are seen in gynae, and if women are not in maternity, they are in gynae ..."

The document analysis observed that a few aspects of PCC were included in the document. While probing what was included in the midwifery module, the participants revealed that the recently updated midwifery curriculum includes some aspects of PCC for more effective preparation of midwives for its provision in practice areas.

"... since we recognized the importance of preconception care and the benefits it can bring into maternal and child health, we have started adding that up as one of the critical competencies that a midwife should possess at the end of training."

Nurse educators articulated that PCC was not included in the old midwifery curriculum which, is currently being replaced with an updated one.

"The new curriculum is focusing on the part of preconception care unlike the old one. I am happy that now we've started with this new curriculum because our students can now do lots of things".

Document analysis revealed concordance between learning objectives and outcomes; therefore, the curriculum developers were interrogated on how this was ensured under 'applying.' They highlighted measures that to avoid omitting critical areas during curriculum development. This includes member checking, moderation, and comparing the curriculum with externally set standards. These measures are also applied to ensure that each unit targets specific learning objectives.

"We look at the learning objectives and ensure that it matches the learning outcomes. After drafting the curriculum, we discuss it among the staff to ensure that the whole curriculum is balanced. It was sent to the curriculum specialist and SANC for approval."

"We use the SANC framework as a template and work on that to include the information there. We first share it within the team like we would swap the modules to check if the information is suitable and if they are anything that we think should be added or should be removed. Then it is discussed in the team meeting and reviewed and sent back to the coordinator"

The document analysis shows that clinical aspect of learning accompanies the theoretical aspect. Generally, they are taught the theoretical aspect of the competency and then simulated practice in the clinical skills laboratory before they are followed to the clinical areas by the preceptors to ensure that theory is linked with practice.

"As we teach or as we facilitate learning, we always bring back what is happening in the clinical areas, our students after being taught whatever content they go to the clinical skills lab that's where we see if the students are competent enough in those particular skills and

then the students will then be going to the clinical areas that's where they actually practice or perform whatever skills they've been taught in the classroom. We also do clinical accompaniment."

"You teach the theoretical components at the same time you look at the student's clinical experiences or what the clinical experience should be and then ensure that they try to practice these skills in the clinical setting or a simulated laboratory."

Document analysis revealed the degree of evaluation for each learning unit. Nurse educators also unearth the planned taxonomic level of assessment for PCC services that are supposed to be delivered. They revealed that the level of assessment depends on the skills that students are expected to learn. For example, an equal level of evaluation is apportioned for psychomotor skills.

"There will be a written and a practical exam. We use bloom's taxonomy as a framework to ensure that we cover the whole taxonomy levels depending on the required skills".

"The type of assessment depends on the type of the skill. For example, childbearing women are prone to cancer, so if students are to be tested on a collection of swabs for a pap smear. The assessment will be clinical assessment".

The following themes and sub-themes revealed the educators' perceptions about teaching PCC.

4.6. Theme 2. views about teaching PCC

Participants voiced their views about preparing nurses for PCC provision and how it can be efficiently done to achieve the desired aim for inclusion. It includes view about teaching, assessment, and preparation.

Regarding teaching nurses about PCC provision, participants expressed that it should be taught as a standalone topic and not embedded in managing various nursing conditions, as such awareness is not raised in learners concerning the significance of this concept.

"PCC should be included as a topic on its own. It would be better if it is done as a topic and should also be done with various conditions where it is required, such as what PCC would be required for conditions such as diabetes."

Evidence from the document assessment shows that PCC was referred to in two domains of the curriculum: objectives and content outline but not in assessment criteria. On the other hand, participants expressed that there is a need for a formal assessment of any aspect of PCC to evaluate learners' level of preparation and readiness at the end of their training.

"... it needs to be a competency to be checked or to be done at the end of the semester to see whether that was achievable or not ... they have to be evaluated in their third year to see if they are ready or not"

They further felt that PCC needs further attention in midwifery and should be a competency that should be effectively practiced. However, the SRH module covers most aspects.

"... it should be a core competency; it should be done as part of midwifery practice education ... It is there, but it is not practiced or implemented."

The nurse educators involved in teaching PCC interventions highlighted that the assessment students receive is based on the skills and Bloom's taxonomy they are expected to achieve, whether cognitive or psychomotor.

"The assessment has a theoretical component and then it's got a practical component, and each aspect has its percentage, and its own pre-determined weighting."

Nurse educators with regards to preparation believe that PCC should be given the level of attention to ensure that learners will have a full grasp of what is required of them concerning its provision in the clinical areas. They felt that nurses should be adequately prepared for PCC provision without support and supervision, as with every other competency.

"We should aggressively teach PCC in a way for it to sink into the minds of the students so that they would go back to the community and practice it. We need to drive this concept. Students should be prepared to provide PCC as independent practitioners, without guidance."

PCC should be taught so that when the students are placed in the outlining clinic or hospital, they can provide it. It should be emphasised so that they understand its importance."

4.7. Theme 3. barriers to teaching PCC

The nurse educators stated some perceived barriers to teaching PCC to students, including misconceptions about midwifery and lack of focus.

Some midwifery educators pointed out the misconceptions that midwifery focuses only on pregnant women and their care throughout pregnancy and during the postnatal period. Therefore, pregnancy preparation is often excluded in midwifery.

"PCC is taught in gynae, and we always have these things like midwifery is about a pregnant woman. In midwifery, we were not emphasizing a lot of preconception care because we usually get these women when they are already pregnant. The focus in midwifery is more on antenatal, labour, delivery, then postnatal."

“... for us, we say we come in when there is a pregnant woman, and there is a foetus, we need to acknowledge that before there is a pregnancy and before there is a foetus, there is something else before that.”

The nurse educators acknowledged a lack of emphasis and attention on PCC, which has affected their teaching of the concept to learners.

“... that we don't teach PCC is just that there's not much focus on it, there is not much focus on preconception health and care. We have not really tapped on it.”

5. Discussion

The study aims to explore the integration of preconception care into the recently updated Bachelor of nursing curriculum in South Africa. Using the four components of the BEKA models': benchmarking, evidencing, knowing, and applying [22] to analyse the PCC content of the BN curriculum.

5.1. Benchmarking

Benchmarking which focuses on comparison was done by evaluating the BN curriculum against the SANC set standards. Hall stipulated that the curriculum be evaluated against the criteria. Benchmarking with national and international professional bodies is vital in nursing curriculum analysis. The definitions and descriptors of the topic under analysis are chosen to assist the identification of the concept [22]. In this study, PCC, its synonyms, and its components provided before pregnancy were analysed. Evidence from benchmarking shows that the curriculum under scrutiny complied with the standards set by external bodies.

5.2. Evidencing

Evidencing which involves mapping of documents against benchmarks was done by comparing the PCC components covered in the reviewed curriculum with the proposed components by WHO. The findings revealed that over 50% of the PCC package was covered in the reviewed curriculum. This indicates a substantial coverage of the PCC concept in the analysed curriculum. Although this intervention still requires more scope and emphasis in the most crucial module, such as PHC, community and midwifery. PCC is mainly targeted in the SRH module and some aspects in PHC, community and midwifery modules. Both general nurses and midwives were identified to be better positioned to provide PCC [34–36]. Although there was no consensus on what should be included in the midwifery competency, there is guidance from the International Confederation of Midwives framework. It contains detailed information on pre-pregnancy service knowledge requirements for midwives [4]. The gaps in the proposed PCC package were in the areas of nutritional conditions and supplementation, environmental and mental health, vaccine-preventable diseases, and female genital mutilation. Among these gaps, nutritional conditions and supplementation are crucial areas in the South African context. This is due to the current upsurge in the rate of obesity in the country, as the country is ranked as the third most obese country in the world [37].

5.2.1. Knowing and applying

Under knowing and applying which entails a deeper assessment of the content through interviewing of stakeholders to understand what students know and apply, enquiries were made from nurse educators and curriculum developers regarding what and how students are taught and assessed. Data sources revealed some degree of integration of PCC in BN education in a country still battling a high maternal and child mortality rate. The main themes that emerged from the interviews demonstrated the (1) Extent of PCC in the Bachelor of nursing curriculum, (2) Views about teaching PCC and (3) Barriers to teaching PCC. Some of the main themes were also corroborated by the content analysis findings of the curriculum. According to World Health Organisation, PCC's main aim is to extend the continuum of care [2].

We discovered that PCC is prominently described in the SRH module, which is part of general nursing training. We also uncovered a remarkable amount of PCC activities and components that had been incorporated into the BN curriculum through the sexual, reproductive and community health care modules. In the proposed action steps for implementing national PCC programs. The PCC workforce's education and training, including incorporating PCC education into the nursing curriculum for clinical care nurses, were advocated [38]. Delvoe et al. also proposed that PCC be incorporated into the nursing and medical school's curriculum for it to be effectively implemented [39]. The integration of PCC in the midwifery module of the analysed curriculum was not as comprehensive as it should be. Midwives are involved in the care of women postnatally and in rendering contraceptive services, which is the moment to educate and counsel women for future pregnancy. Therefore, student midwives should be well prepared for the provision of PCC. The nurse educators indicated that PCC had been added to the content of the current midwifery curriculum after they realised the impact its provision can make on women's health. However, this was not very evident in the analysed document. An experimental study revealed that the inclusion of PCC education into the curriculum of health care workers significantly improved their knowledge and provision of PCC [15]. Therefore, this integration is expected to produce well-informed nurses who can link theory to practice by providing PCC to the public.

The curriculum developers further unearth the process of curriculum development to avoid null curriculum and ensure that theory is linked to practice. They also highlight that the level of assessment varies depending on the required skills based on bloom taxonomy levels. Further investigation on how nurses can be effectively prepared for PCC provision revealed that assessing PCC competency

among students is required. Educators envisaged that this would enable students to see the practicality of this learning curve in the clinical area. This aspect of assessment was not also visible in the analysed curriculum. The nurse educators also purported that delivery of PCC should be better if it is taught as a separate topic and still be incorporated in managing specific conditions that require PCC. According to them, the teaching of PCC should be in such a way as to enable adequate preparation of students for PCC provision in the clinical areas. The analysis of the BN curriculum also pointed to some aspects of PCC being taught as a separate topic, especially in the SRH module. However, that is not the case for other modules, as no component of PCC is included as competency on its own. Participants also indicated the need to assess PCC concepts, but the analysed document has no assessment evidence.

Among the barriers to teaching PCC, we found poor perception about its inclusion in midwifery. Midwives perceived their role to be towards a pregnant woman, the unborn fetus, and the newborn only. Pre-pregnancy assessment and guidance of women were not perceived as a critical focal point of midwifery training by the participants. They were unaware that PCC services can still be provided as inter-conception care to women for subsequent pregnancies during postnatal periods, during the well-baby clinic, and during family planning services. Therefore, midwives, primary health and general nurses are suitably positioned by virtue of their role in the healthcare sector to provide inter-conception care and PCC advice for subsequent pregnancies [5,13]. As a result, PCC should be given equal attention in both modules, and learners should be guided on the context in which the services should be rendered. Women with pre-existing conditions should not be discharged after delivery without adequate information on required care for subsequent pregnancies. These findings are consistent with that of [35], where midwives believe that they deal with pregnant women only.

On the other hand, a lack of focus on PCC activities during the training of nurses was also identified as an obstacle. Nurses often ignore preparing women and families for pregnancy due to poor focus on this aspect of care in their training. Considering the degree of unplanned pregnancies worldwide, nurses and all healthcare workers should form the habit of assessing the pregnancy plan of women of childbearing age and give adequate guidance accordingly. Therefore, we recommend that proper focus be given to PCC activities. PCC should also form part of all graduate and post-graduate nursing programs and its content included in all educational curricula of other public and medical health professionals.

5.3. Strength and limitations

The strength of our study is that it uses two data sources to complement and triangulate information on the integration of PCC into the Bachelor of nursing curriculum. The limitation of this study is that only one nursing education curriculum was evaluated. Furthermore, the 'applying' aspect of the model was not analysed because the curriculum under scrutiny had just been implemented. Therefore, the students have not been evaluated. This study also involves one institution, which limited the number of nurse educators involved.

5.4. Future research

The findings of this study can form the basis for further research on the quality of PCC training of other nurses in postgraduate training and in areas where the curriculum has been recently upgraded. Future studies are required on other nursing training programs and training of other health care workers that have a significant role in PCC provision to identify the PCC level of integration. There is also a need to complete the last aspect of the framework to understand the student's view about this concept.

6. Conclusion

The findings from this analysis under 'benchmarking and evidencing' revealed that the BN curriculum under review complied with the professional bodies standard and covers most of the PCC package as stipulated by WHO. Although the implementation of the reviewed curriculum is still in its infancy, there is an indication that PCC education is heading in the right direction if all the outlined concepts in the curriculum are adequately delivered and the key areas emphasised. It also uncovers the degree of PCC integration into the BN curriculum, the stakeholders' view about teaching PCC concepts to students, and the barriers to teaching PCC. Ostensibly, the program's most emphasised PCC services and components include lifestyle counselling, genetic counselling, family planning, adolescent and women's reproductive health services, sexual transmitted infections screening, and HIV management. However, more effort is required in some key modules, such as primary health care and midwifery, to ensure adequate emphasis and to substantiate the aspects of PCC covered in its course content. This study could assist curriculum developers in considering critical elements to be included in nursing education content to produce competent, independent nurse practitioners. Specialty midwifery and PHC programs should target more PCC components for adequate preparation of nurses for its provision following the directives of the professional bodies. The limitation, however, is that the 'applying' component of the framework was not entirely done due to time constraints, as the curriculum is still in the implementation phase.

Author contribution statement

Winifred Chinyere Ukoha: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Ntombifikile Gloria Mtshali: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data will be made available on request.

Declaration of interest's statement

The authors declare no conflict of interest.

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