

## **Strategies to enhance the approach to prostate cancer screening of south African Black men in the Free State: a Delphi study**

Matthew Olukayode Abiodun Benedict,<sup>1</sup> Wilhelm Johannes Steinberg,<sup>1</sup> Frederik M. Claassen,<sup>2</sup> Nathaniel Mofolo<sup>3</sup>

<sup>1</sup>Department of Family Medicine, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa; <sup>2</sup>Department of Urology, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa; <sup>3</sup>School of Clinical Medicine, University of the Free State, Bloemfontein, South Africa

**Correspondence:** Dr Matthew O.A. Benedict, Department of Family Medicine, School of Clinical Medicine, Faculty of Health Sciences, University of the Free State, PO Box 339, Bloemfontein, 9301, South Africa.

Tel.: +27(0)514013307/(0)838580237.

Fax: +27(0)514013312.

E-mail: [benedictMA@ufs.ac.za](mailto:benedictMA@ufs.ac.za)

**Key words:** prostate cancer; strategies; improve; screening; knowledge, attitude and practice; KAP; black men; African.

**Acknowledgments:** the authors would like to thank the participants for their time. Thanks also go the departments of Family Medicine, Urology and Biostatistics for their support.

**Contributions:** MOAB, conceptualised the study with inputs from WJS, FMC and NM, collected and analysed the data and wrote the manuscript. All the authors approved the final version to be published.

**Conflict of interest:** the authors declare no potential conflict of interest.

**Funding:** the study was conducted with financial assistance from the Faculty of Health Sciences, University of the Free State, through the Three Schools of Medicine Research and Postgraduate Committee. The contents of this document are the sole responsibility of the authors.

**Ethics approval and consent to participate:** the study was approved by the Ethics Committee of the Faculty of Health Sciences, University of the Free State (UFS-HSD2020/1481/2411).

**Availability of data and materials:** all data generated or analyzed during this study are included in this published article.

**Informed consent:** participants gave written informed consent before they were enrolled in the study.

## **Abstract**

**Background.** The incidence and mortality rates of prostate cancer (PCa) are disproportionately on the increase among South African Black men. Recent studies show a greater net benefit of prostate-specific antigen (PSA) screening of Black men compared with the general population. There are, however, knowledge, attitude and practice (KAP) gaps among primary healthcare providers (HCPs) and users (Black men) on PCa screening. Likewise, there is scarcity of research on strategies to address these gaps.

**Objective.** This study sought to determine complementing strategies to enhance the approach to PCa screening of African men in the Free State, South Africa, from the perspectives of primary HCPs and users.

**Methods.** This study utilized a three-round modified Delphi survey to achieve its aim. Consensus was determined by an a priori threshold of  $\geq 70\%$  of agreement.

**Results.** The survey involved a multidisciplinary panel of 19 experts. The consensus was reached on 34 items (strategies) to enhance the approach to PCa screening in the study setting. Community health education strategies were proffered, relating to relevant topics, methods and venue of delivery, and persons to deliver the education. Continuing education topics and methods of instruction were suggested for primary HCPs.

**Conclusion.** In view of the existing KAP gaps in PCa screening among primary HCPs and users (Black men), an expert consensus was determined, on complementing strategies to enhance the approach to PCa screening of South African Black men in the study setting.

## **Introduction**

Prostate cancer (PCa) ranks the second most frequent cancer diagnosis and the fifth leading cause of death among men worldwide. The impact is greater in Africa and low- and middle-income countries due to specific genetic, socioeconomic and sociocultural factors, among others.<sup>1,2</sup> In South Africa, the PCa incidence rate has increased from 29 per 100,000 men in 2007<sup>3</sup> to 68 per 100,000 men in 2018.<sup>4</sup> As observed globally, PCa incidence and mortality are higher among South African Black men compared with men of other races.<sup>5,6</sup>

Prostate-specific antigen (PSA) screening - though controversial due to the associated false positive results, over-diagnosis, overtreatment and related complications<sup>7</sup> - remains a practicable method of controlling the disease through early detection;<sup>8</sup> especially in Africa, where there is higher mortality compared to other regions of the world.<sup>9</sup> More recent studies have shown that PSA screening may be of greater net benefit among Black men compared with the general population.<sup>7,10</sup>

The realisation of an improved approach to PCa screening will require the combined effort of primary healthcare providers (HCPs) and users (Black men). Adequate knowledge and awareness of men on risk factors and symptoms of the disease will promote their early presentation. Likewise, the HCPs are more likely to promptly identify at-risk men and appropriately intervene if they know certain important aspects of the disease, e.g., risk factors, symptoms, screening tests, diagnosis and treatment options. Such knowledge is a prerequisite for the proper conduct of shared decision-making (SDM), a process whereby HCPs support healthcare users to make healthcare choices.<sup>11</sup> Besides knowledge, certain cultural beliefs and attitudes may inform the practice of HCPs and users of PCa screening. Such misconceptions need to be addressed.

Despite the under-resourced state of African health systems, there is undue focus on the hospitals at the expense of primary health clinics serviced by low-level and poorly trained HCP.<sup>12</sup> In South Africa, there are varied categories and cadres of HCPs working in the primary healthcare settings. These include medical doctors, i.e., interns, medical officers (including community service medical officers), family medicine registrars and specialist family physicians, whose role, among others, are to support community-oriented primary care and ensure its functionality.<sup>13</sup> The nursing staff include enrolled nurse assistants, enrolled nurses and professional nurses. Another recently introduced HCP category is the clinical associates, who work under the supervision of doctors. Lastly are the community healthcare workers. Nurses form the largest segment of the healthcare system in South Africa.<sup>14</sup> Due to the low doctor-to-patient ratio and difficulties in allocating doctors to rural areas, primary healthcare in South African state facilities remains nurse-led.<sup>12,15</sup>

Studies have established knowledge, attitude and practice (KAP) gaps regarding PCa screening among African men<sup>9,16,17</sup> and their primary HCPs.<sup>18,19</sup> Although KAP gaps have been identified, there is a paucity of studies specifying the interventions needed to address these gaps.

The continuum of education for HCPs may be viewed from the perspective of four educational settings over the lifetime of their career: ‘formal education at undergraduate and postgraduate levels; maintenance of competence through continuing professional development (CPD); development of new or extended roles, such as academic research or professional leadership; and finally the skills needed for teaching, mentoring and supervising others’ (pg. 26).<sup>20</sup> Continuing professional development consists of educational activities that maintain, develop and increase the skills, professional practice and relationships that HCPs need to optimize patient care. Continuing professional development refers to the education that follows

qualification or licensure. Numerous studies have confirmed that it improves HCP practice and, in some instances, healthcare outcomes.<sup>21</sup>

Experts suggest the need to develop more effective courses for primary HCPs, especially nurses, clinical associates and community health workers (CHWs), to enhance their educational background and strengthen their collaborative functionality within the primary healthcare system.<sup>22</sup>

The following have been shown as effective methods of instruction among CHWs: role play, case studies, teach back, group presentation, interactive didactic, demonstration, group assessment, group discussion, hands-on practice and individual assessment.<sup>23</sup>

In the nursing profession, commonly used practices for continuing nursing education are short, repeated education; interactive techniques, e.g., simulation models, audio-visual learning modalities; teamwork in healthcare settings; use of cultural context and the practice of assessment and feedback.<sup>24</sup> A survey among primary care physicians showed a higher preference for learning about cancer screening through the following educational formats: conferences, self-directed, small group workshops, hospital rounds and online CPD/CME (continuing medical education).<sup>21</sup> To be effective, health education strategies should be tailored to the target population. Health topics should be appropriate for the targeted population and delivered in an appropriate setting.<sup>25</sup>

This study presents an expert consensus on strategies to enhance the approach to PCa screening of African men in the Free State, South Africa, from the perspectives of HCPs and users.

### **Establishing consensus using the Delphi method**

In a Delphi technique, a reliable consensus opinion of a group of experts is generated through an iterative process of questionnaires, with intervals of controlled feedback.<sup>26</sup> It is based on the belief that a group of experts' collective views are of greater credence than an individual's. Studies have used Delphi methods to determine the educational needs of HCPs.<sup>27,28</sup> Several rounds of questionnaires are sent out to the group of experts, and the anonymous responses are collated and shared with the group after each round. The experts may adjust their answers in subsequent rounds based on their interpretation of the 'group response' shared with them. The Delphi method aims to arrive at a reliable response through consensus.<sup>26</sup>

Unlike the classical Delphi, the modified Delphi technique begins, in the first draft of the questionnaire, with a series of close-ended sentences or questions related to the study title. These questions are carefully selected by the convenor through literature reviews and expert consultation. The modified Delphi study allows for the collection of panellists' input through

open-ended questions by asking if they have suggestions or additions to the list prepared by the convenor.<sup>29,30</sup>

While no standard exists regarding the number of panellists required for a Delphi, between 10 and 18 experts are recommended to ensure the needed productive group dynamics leading to a reasonable consensus.<sup>29</sup> Consensus is usually determined by an a priori threshold of about 70% of agreement.<sup>30</sup>

## **Setting**

The Free State is geographically the third-largest province in South Africa and constitutes 5.1% of the national population. The province comprises Mangaung Metropolitan Municipality and four district Municipalities namely: Xhariep, Lejweleputswa, Thabo Mofutsanyana and Fezile Dabi. Most of the population reside in Mangaung and Thabo Mofutsanyana. The economy is dominated by agriculture, mining and manufacturing.

The primary healthcare facilities in the Free State include primary health local clinics, community health centres and district hospitals. In the Free State, there are 24 district hospitals and 231 fixed clinics (i.e., local clinics and community health centres). Most of the population using public health services attend these healthcare facilities.<sup>31</sup> Ward-Based Primary Health Care Outreach Teams (WBPHCOTs) undertake outreach household visits to provide basic PHC services, including counselling and health promotion.<sup>31</sup> The WBPHCOTs are linked to the PHC facilities and consist of CHWs led by nurses. The CHWs assess the health status of individuals in households and provide health education and promotion services. They identify and refer those in need of preventive, curative or rehabilitative services to relevant PHC facilities.<sup>31</sup>

## **Materials and Methods**

### ***Ethical considerations***

Permission to conduct the study was granted by the Head of the Free State Department of Health, and ethical approval was obtained from the Health Sciences Research Ethics Committee (HSREC) of the University of the Free State (UFS-HSD2020/1481/2411).

Following a detailed description of the study, signed informed consent was obtained from each participant before participating. The voluntary nature of participation and the right to refuse to participate or to withdraw at any time was also explained.

### ***Study design and setting***

A modified Delphi technique was used to engage an expert panel of HCPs, to gain consensus on strategies required to enhance the approach to PCa screening of African men in the Free

State from the perspectives of HCPs and users. In compliance with the tenets of the Delphi approach, methodological rigour was maintained, *viz*: anonymity, iteration, controlled feedback and group response.

### ***Panel recruitment***

The researcher invited 22 healthcare experts; two were international; the rest were from the Free State. They were selected from healthcare disciplines relevant to PCa screening: ‘*medical*’ (family medicine, urology, oncology and health professions education) and ‘*nursing*’ (primary care, nursing education and nursing oncology).

Before the commencement of the Delphi study, the experts were contacted and introduced to the study via email. The information leaflet and informed consent document were emailed, and the experts were requested to read, complete and sign if they agreed to participate in the study. The signed informed consent documents were emailed back to the researcher. The experts received a link to the online survey upon consenting to participate.

Participants were only included as part of the expert panel if they fulfilled the following criteria:

- At least 10 years’ experience in the aspects of PCa screening and early diagnosis,
- Current registration with the relevant professional councils,
- Willingness to participate in the study and signing of consent, and
- Proficiency in English.

### ***Overview of the Delphi process***

Consensus was achieved through a three-round modified Delphi survey. An overview of the Delphi process for this study is depicted in Figure 1.

The first-round Delphi questionnaire contained a series of close-ended sentences or questions related to the study title; these questions were carefully selected by the researcher through literature reviews. The Faculty (of Health Sciences) evaluation committee consisting of consultant family physicians, a urologist, medical educators, a professional nurse and a biostatistician, subjected the questionnaire to review.

The questionnaire is divided into seven sections; the first six sections start with a leading question followed by corresponding items, while the seventh section accommodated additional suggestions from the experts, as depicted in Table 2.

## **Round 1**

On 18 May 2021, this questionnaire was sent to the selected experts in the first round. The participants responded to each item on a 3-point Likert scale (1 = Yes; 2 = Maybe and 3 = No). The questionnaire items included possible strategies to enhance the approach to PCa screening of African males in the Free State. As a characteristic of a modified Delphi approach, there was also an open-ended section for the participants to include any further suggestions.

The researcher collected and analysed the completed data using the EvaSys® survey management system. The result of the first round was summarised and disclosed to the participants. For this study, consensus was regarded to have been achieved on questionnaire items on which  $\geq 70\%$  of the participants agreed to be 'Yes' and such items were excluded from the subsequent rounds.

## **Round 2**

Statements in which consensus had been reached in the first round were excluded from the second round. Items on which consensus was not reached during the first round, as well as additional comments suggested by the participants, were included in the second round. The second round Delphi questionnaire was sent out on 24 June 2021. The same data analysis and result disclosure process to participants were followed.

## **Round 3**

Statements in which consensus had been reached in the second round were excluded from the third round. Items on which consensus was not reached during the second round, as well as additional comments suggested by the participants, were included in the third round. The third round Delphi questionnaire was sent out on 06 August 2021.

Stability was achieved when participants did not change their responses from round to round, making it unnecessary to resend such questions.

A time interval of 2 weeks was allowed for the participants to respond during each round. Reminders were sent electronically and telephonically to non-responding participants. The participants responded within 5 weeks for each round, making the duration of the Delphi survey approximately 4 months.

## **Results**

The modified Delphi survey was conducted in three rounds. Out of the 22 experts invited, 19 (86.4%) participated in the three rounds. A brief demographic profile of the participants is shown on Table 1.



The summary of the three rounds is as depicted in Table 2. The survey started with 33 questionnaire items in Round 1. Twelve new items were suggested by the participants, i.e., 11 and one during the first and second rounds, respectively, giving a total of 45 questionnaire items. Consensus was reached on 34 (75.6%) items. There was a high level of consensus (more than 80% of the participants) for 22 out of the 34 items. This section presents a more detailed report on the participants' responses to each of the seven sections of the questionnaire.

### **Consensus on questionnaire items**

**Section 1:** *'Shared decision-making (SDM) for prostate cancer (PCa) screening: What risk factors or criteria should warrant SDM for PCa screening among African men 40 years and older?'*

As shown in Table 2, there were five items in this section, one of which was suggested by an expert during Round 1. Consensus was reached on only two items, i.e., 'Men with one or more 1<sup>st</sup> degree relative with PCa' and 'Men with one or more lower urinary tract symptoms (LUTS)'. Consensus was not reached on the following three items: 'Men with frequent pain or stiffness in the lower back', 'Men with unexplained weight loss' and 'Family history of breast cancer'.

**Section 2:** *'Which community health education topics are relevant to enhance PCa screening knowledge attitude and practice (KAP) among African men?'*

This section contained 11 items, two of which were suggested during Round 1. Consensus was reached on eight items (Round 1 = six items; Round 2 = two items). Consensus was not reached on the following three items: 'Fatalism (fatalistic attitude) regarding PCa', 'Situational barriers to PCa screening' and 'Disadvantages of PCa screening (false positives and false negatives)'.

**Section 3:** *'Which community health education methods can be engaged to enhance PCa KAP among African men?'*

This section contained six items, two of which were suggested during Round 1. Consensus was reached on five items (Round 1 = four items; Round 2 = one item). Consensus was not reached on the following item: 'Outreach by health system care coordinators and payer patient navigators'.

**Section 4:** *'What community strategies should be engaged to enhance PCa health education?'*

This section contained six items, four of which were suggested during Round 1. Consensus was reached on five items (Round 1 = two items; Round 2 = three items). Consensus was not reached on the following item: ‘Traditional leaders can also be used especially those in charge of initiation schools’.

**Section 5:** *‘Which continuing educational topics should be included in refresher courses to enhance PCa KAP among primary healthcare providers?’*

This section contained eight items. There were no new suggestions from the experts. Consensus was reached on all the items (Round 1 = five items; Round 2 = three items).

**Section 6:** *‘Which continuing education methods should be engaged to enhance PCa KAP among primary healthcare providers?’*

This section contained seven items, one of which was suggested during Round 2. Consensus was reached on four of these items (Round 1 = three items; Round 3 = one item). Consensus was not reached on the following three items: ‘Workshop / group tasks’, ‘Didactic lectures’ and ‘Practical sessions / simulated learning’.

**Section 7:** *Other suggestions*

This section contained two items which do not necessarily fit under the above-stated six sections:

‘Healthcare workers, like other professions, should be responsible for staying up to date with literature in their field’ and ‘This subject should be considered for undergraduate teaching, learning and assessment’.

Both were suggested by the experts in Round 1. Consensus was reached on both in Round 2.

### **The strategies to enhance the approach to prostate cancer screening**

The strategies suggested by the experts to enhance the approach to PCa screening were classified into two groups:

- Group 1 (Table 3): Strategies targeted at primary healthcare users (i.e., African men), which were sub-classified under the following themes: (i) WHAT health education topics, (ii) HOW (methods of) health education, (iii) WHO (persons) to give the health education, and (iv) WHERE (venue of the) health education, and

- Group 2 (Table 4): Strategies targeted at primary HCPs, which were sub-classified under the following themes: (i) WHAT continuing education topics, and (ii) HOW (methods of) continuing education.

## **Discussion**

This Delphi study aimed to develop consensus on strategies to enhance the approach to PCa screening of African men in the Free State, South Africa. A multidisciplinary group of experts were selected to participate in this study as the subject of PCa cuts across several fields of medicine. Most participating experts were over 50 years, which correlates with their years of experience, i.e., > 20 years.

Shared decision-making is a process whereby HCPs collaborate with patients to make health decisions based on available scientific evidence and patient values, i.e., risk communication and value clarification.<sup>32</sup> This process is essential when screening for conditions associated with a close trade-off between harms and benefits.<sup>32</sup>

There was consensus that ‘Men with one or more 1<sup>st</sup> degree relative with PCa’ and ‘Men with one or more Lower Urinary Tract Symptoms (LUTS)’ should be considered for SDM for PCa screening. Pain and/or stiffness in the lower back and unexplained weight loss are non-specific symptoms; this may explain the reason for non-consensus on these items. Though studies have shown that first-degree family history of breast cancer is a risk factor for PCa,<sup>33,34</sup> consensus was not reached on this item.

Health topics such as epidemiology, anatomy and physiology of the prostate gland, risk factors, symptoms and signs, informed decision-making, prevention and screening methods have been shown to improve community knowledge and awareness regarding PCa.<sup>35,36,37</sup>

While consensus was reached on most health topics to enhance KAP on PCa screening, consensus was not reached on fatalistic attitude, situational barriers and disadvantages of PCa screening. Fatalistic beliefs could either be a barrier to the uptake of PCa screening<sup>38</sup> or have no effect.<sup>9</sup> This inconclusive effect of fatalistic beliefs may be the reason for non-consensus on its inclusion as a relevant topic. Likewise, the perceived barriers to screening may vary from one individual to another. The process of SDM in PCa screening is incomplete without discussing its disadvantages. The experts’ decision notwithstanding, it might be valuable to address these topics in workshops or focus group discussions.

Patient navigation is sometimes viewed as the support given to persons who already have health challenges (e.g., abnormal cancer screening or a new cancer diagnosis), enabling them to promptly access the relevant healthcare system in a culturally-sensitive manner.<sup>39</sup> This study

focused on PCa screening; thus, the experts might have viewed patient navigators as irrelevant in the context of this study. Some authorities view traditional leaders as essential in promoting PCa screening awareness in the community;<sup>40</sup> it is unclear why there was no consensus on the inclusion of this item as a strategy for promoting PCa health education.

Studies have identified certain knowledge gaps regarding PCa among HCPs;<sup>18,19</sup> all eight topics suggested for continuing education among HCPs achieved consensus.

Consensus was not reached on including workshop and/or group tasks, didactic lectures and practical sessions and/or simulated learning as methods of continuing education among HCPs. In contrast, studies have shown group work, simulation, repeated lectures and workshops to be effective methods of continuing education among HCPs.<sup>21,23,24</sup>

Prostate cancer is on the list of topics engaged for teaching and learning among medical and nursing undergraduates from the University of the Free State, Faculty of Health Sciences. This subject is also featured in the training manual and workbook for CHWs in South Africa. Emphasis should be laid on topics and learning methods shown to have a positive impact on knowledge.

Family physicians function in the community as champions of community-oriented primary care, care providers, capacity builders, consultants, clinical trainers and clinical governance leaders.<sup>41</sup> Therefore, in conjunction with the other relevant HCPs and stakeholders, family physicians are pivotal in the planning, implementation and evaluation of the strategies recommended in this study.

### ***Strengths and limitations***

As far as we know, this is the first study in this setting aiming to recommend strategies to enhance PCa screening approach. The recommended strategies addressed both the HCPs and users. There was a high response rate of multidisciplinary groups of participants, who were local and international HCPs, with a wealth of experience in the subject.

The strategies stemming from this study may be adapted to improve the approach to screening for other common cancers in the study setting. However, being a Delphi study, the viewpoints and decisions of the experts collated in this report are subjective and may not necessarily be accurate.

### **Conclusions**

This study is a sequel to the need to address the existing KAP gaps on PCa screening among primary HCPs and users. Consensus was reached by a multidisciplinary expert panel on

strategies to enhance the approach to PCa screening in the study setting. Community health education strategies were proffered, relating to relevant topics, methods of delivery, venue of delivery and persons to deliver the education. Continuing education topics and methods of instruction were suggested for primary HCPs. Further research should be done to implement these strategies and evaluate PCa screening awareness and practice in the study setting

## References

1. Adeloje D, David RA, Aderemi AV, et al. An estimate of the incidence of prostate cancer in Africa: A systematic review and meta-analysis. *PLoS One* 2016;11(4):e0153496. <https://doi.org/10.1371/journal.pone.0153496>
2. Bahnassy AA, Abdellateif MS, Zekri AN. Cancer in Africa: Is it a genetic or environmental health problem? *Front Oncol* 2020;10:604214. <https://doi.org/10.3389/fonc.2020.604214>
3. Le Roux HA, Urry RJ, Sartorius B, Aldous C. Prostate cancer at a regional hospital in South Africa: we are only seeing the tip of the iceberg. *S Afr J Surg* 2015;53(3 and 4):57–62.
4. Cassim N, Ahmad A, Wadee R, Rebbeck TR, Glencross DK, George JA. Prostate cancer age-standardised incidence increase between 2006 and 2016 in Gauteng Province, South Africa: A laboratory data-based analysis. *S Afr Med J* 2020;111(1):26–32. <https://doi.org/10.7196/SAMJ.2020.v111i1.14850>
5. Dewar M, Kaestner L, Zikhali Q, Jehle K, Sinha S, Lazarus J. Investigating racial differences in clinical and pathological features of prostate cancer in South African men. *S Afr J Surg* 2018;56(2):54–8.
6. Nkoana S, Sodi T, Makgahlela M, Mokwena J. Cancer survivorship: religion in meaning making and coping among a group of Black prostate cancer patients in South Africa. *J Relig Health* 2022;61(2):1390–400. <https://doi.org/10.1007/s10943-021-01406-3>
7. US Preventive Services Task Force, Grossman DC, Curry SJ, et al. Screening for prostate cancer: US Preventive Services Task Force Recommendation Statement. *JAMA* 2018;319(18):1901–13. <https://doi.org/10.1001/jama.2018.3710>

8. Cuzick J, Thorat MA, Andriole G, et al. Prevention and early detection of prostate cancer. *Lancet Oncol* 2014;15(11):e484–e92. [https://doi.org/10.1016/S1470-2045\(14\)70211-6](https://doi.org/10.1016/S1470-2045(14)70211-6)
9. Mutua K, Pertet AM, Otieno C. Cultural factors associated with the intent to be screened for prostate cancer among adult men in a rural Kenyan community. *BMC Public Health* 2017;17(1):894. <https://doi.org/10.1186/s12889-017-4897-0>
10. Basourakos SP, Gulati R, Vince RA Jr, et al. Harm-to-benefit of three decades of prostate cancer screening in Black men. *NEJM Evid* 2022;1(6):10.1056/evidoa2200031. <https://doi.org/10.1056/evidoa2200031>
11. Eales OO, Smith S. Do socio-economically disadvantaged patients prefer shared decision-making? *S Afr Fam Pract* 2021;63(1):e1–e6. <https://doi.org/10.4102/safp.v63i1.5293>
12. Dullie L, Meland E, Hetlevik Ø, Mildestvedt T, Gjesdal S. Development and validation of a Malawian version of the primary care assessment tool. *BMC Fam Pract* 2018;19(1):63. <https://doi.org/10.1080/20786190.2019.1596666>
13. Mash B, Ray S, Essuman A, Burgueño E. Community-orientated primary care: A scoping review of different models, and their effectiveness and feasibility in sub-Saharan Africa. *BMJ Glob Health* 2019;4(Suppl 8):e001489. <https://doi.org/10.1136/bmjgh-2019-001489>
14. Free State Department of Health. Annual Performance Plan, Free State Department of Health 2020/21. Bloemfontein, South Africa: Free State Department of Health; 2021.
15. Uebel K, Guise A, Georgeu D, Colvin C, Lewin S. Integrating HIV care into nurse-led primary health care services in South Africa: A synthesis of three linked qualitative studies. *BMC Health Serv Res* 2013;13:171. <https://doi.org/10.1186/1472-6963-13-171>
16. Husaini DL, Harris-Thurton L, Brown NT, et al. Prostate cancer awareness, knowledge, and perception of screening among men aged 40–70 in the Belize district. *J Public Health* 2021;2021. <https://doi.org/10.1007/s10389-021-01527-9>

17. Mofolo N, Betsu O, Kenna O, et al. Knowledge of prostate cancer among males attending a urology clinic, a South African study. Springerplus 2015;4:67. <https://doi.org/10.1186/s40064-015-0824-y>
18. Kappen S, Jürgens V, Freitag MH, Winter A. Early detection of prostate cancer using prostate-specific antigen testing: An empirical evaluation among general practitioners and urologists. Cancer Manag Res 2019;11:3079–97. <https://doi.org/10.2147/CMAR.S193325>
19. Leyva B, Persoskie A, Ottenbacher A, et al. Do men receive information required for shared decision making about PSA testing? Results from a national survey. J Cancer Educ 2016;31(4):693–701. <https://doi.org/10.1007/s13187-015-0870-8>
20. Von Pressentin KB. Evaluating the impact of family physicians within the district health system of South Africa [Thesis (D.Phil)]. Faculty of Medicine and Health Sciences. Stellenbosch, South Africa: Stellenbosch University, 2017:27.
21. Lynn B, Hatry A, Burnett C, Kan L, Olatunbosun T, Bluman B. Identifying primary care physicians continuing education needs by examining clinical practices, attitudes, and barriers to screening across multiple cancers. J Cancer Educ 2018;33(6):1255–62. <https://doi.org/10.1007/s13187-017-1240-5>
22. Mash R, Blitz J. Overcoming challenges in primary care education in South Africa. Educ Prim Care 2015;26(4):274–8. <https://doi.org/10.1080/14739879.2015.11494355>
23. Lightfoot M, Palazuelos D. Evaluating the teaching methods of a community health worker training curriculum in Rural Guatemala. J Fam Med Community Health 2016;3(6):1096.
24. Azad A, Min JG, Syed S, Anderson S. Continued nursing education in low-income and middle-income countries: A narrative synthesis. BMJ Glob Health 2020;5(2):e001981. <https://doi.org/10.1136/bmjgh-2019-001981>
25. Rural Health Information Hub. Health education [homepage on the Internet]. n.d. [cited 13 Jun 2022]. Available from: <https://www.ruralhealthinfo.org/toolkits/health-promotion/2/strategies/health-education>

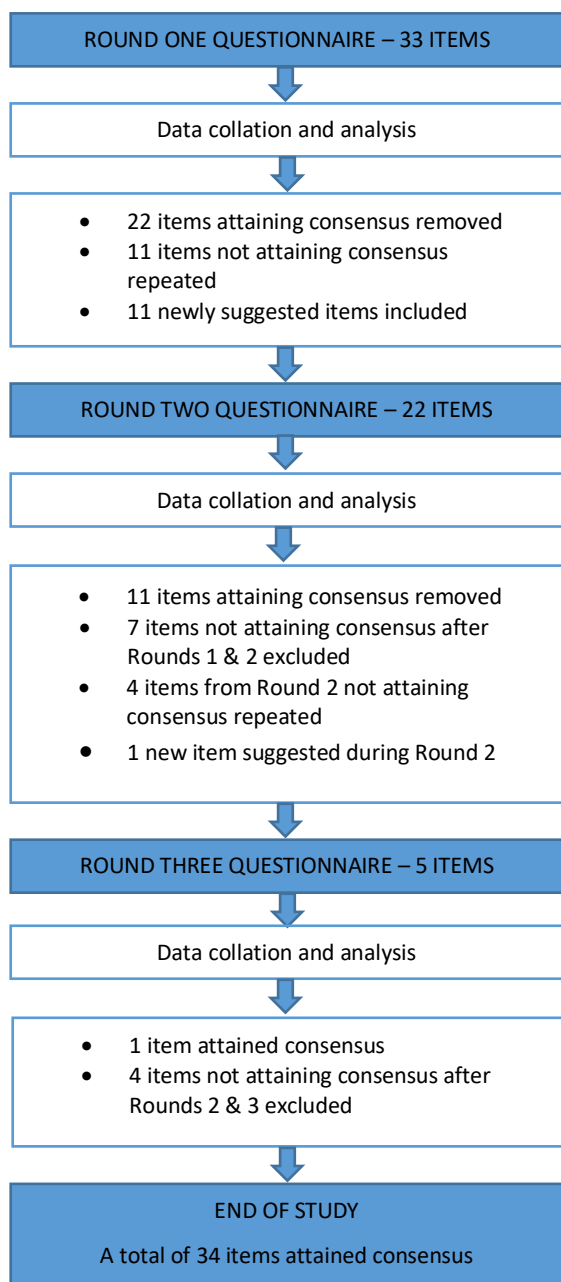
26. Nasa P, Jain R, Juneja D. Delphi methodology in healthcare research: how to decide its appropriateness. *World J Methodol* 2021;11(4):116–29. <https://doi.org/10.5662/wjm.v11.i4.116>
27. Broomfield D, Humphris GM. Using the Delphi technique to identify the cancer education requirements of general practitioners. *Med Educ* 2001;35(10):928–37. <https://doi.org/10.1046/j.1365-2923.2001.01022.x>
28. Hou X, Hu W, Russell L, Kuang M, Konge L, Nayahangan LJ. Educational needs in the COVID-19 pandemic: A Delphi study among doctors and nurses in Wuhan, China. *BMJ Open*. 2021;11(4):e045940. <https://doi.org/10.1136/bmjopen-2020-045940>
29. Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: recommendations based on a methodological systematic review. *Palliat Med* 2017;31(8):684–706. <https://doi.org/10.1177/0269216317690685>
30. Keeney E, Thom H, Turner E, Martin RM, Sanghera S. Using a modified Delphi approach to gain consensus on relevant comparators in a cost-effectiveness model: application to prostate cancer screening. *Pharmacoeconomics* 2021;39(5):589–600. <https://doi.org/10.1007/s40273-021-01009-6>
31. Department of Health. Provincial guidelines for the implementation of three streams of PHC re-engineering. Pretoria, South Africa: Department of Health; 2011.
32. Grad R, Légaré F, Bell NR, et al. Shared decision making in preventive health care: what it is; what it is not. *Can Fam Physician* 2017;63(9):682–4.
33. Barber L, Gerke T, Markt SC, et al. Family history of breast or prostate cancer and prostate cancer risk. *Clin Cancer Res* 2018;24(23):5910–17. <https://doi.org/10.1158/1078-0432.CCR-18-0370>



34. Ren ZJ, Cao DH, Zhang Q, et al. First-degree family history of breast cancer is associated with prostate cancer risk: A systematic review and meta-analysis. *BMC Cancer* 2019;19(1):871. <https://doi.org/10.1186/s12885-019-6055-9>
35. Sandiford L, D'Errico EM. Facilitating shared decision making about prostate cancer screening among African American men. *Oncol Nurs Forum* 2016;43(1):86–92. <https://doi.org/10.1188/16.ONF.86-92>
36. Howard A, Morgan P, Fogel J, et al. A community/faith-based education program to increase knowledge and shared decision making behavior for prostate cancer screening among Black men. *ABNF Journal* 2018;29(3):61–8.
37. Capanna C, Chujutalli R, Murray S, Lwin K, Aung M, Jolly P. Prostate cancer educational intervention among men in western Jamaica. *Prev Med Rep* 2015;2:788–93. <https://doi.org/10.1016/j.pmedr.2015.09.008>
38. Mbugua RG, Karanja S, Oluchina S. Barriers and facilitators to uptake of prostate cancer screening in a Kenyan rural community. *Ann Afr Surg* 2021;18(3):130–6. <https://doi.org/10.4314/aas.v18i3.2>
39. Serrell EC, Hansen M, Mills G, et al. Prostate cancer navigation: Initial experience and association with time to care. *World J Urol* 2019;37(6):1095–101. <https://doi.org/10.1007/s00345-018-2452-y>
40. Ezenwankwo EF, Nnate DA, Oladoyinbo CA, et al. Strengthening capacity for prostate cancer early diagnosis in West Africa amidst the COVID-19 pandemic: A realist approach to rethinking and operationalizing the World Health Organization 2017 Guide to Cancer Early Diagnosis. *Ann Glob Health* 2022;88(1):29. <https://doi.org/10.5334/aogh.3519>
41. Family Physicians SAAO. The contribution of family physicians to district health services in South Africa: A national position paper by the South African Academy of Family Physicians. *S Afr Fam Pract* 2022;64(1):e1–e7. <https://doi.org/10.4102/safp.v64i1.5473>

## Figure caption

**Figure 1. Overview of the Delphi process.**



**Table 1. Demographic profile of the participants.**

<b>Variable</b>	<b><i>n</i> (%)</b>
<b>Gender</b>	
Male	7 (36.8)
Female	12 (63.2)
<b>Age in years</b>	
31–50	8 (42.1)
> 50	11 (57.9)
<b>Profession</b>	
Medical	12 (63.2)
Nursing	7 (36.8)
<b>Rank</b>	
Professor / Consultant	4 (21.0)
Senior lecturer / Consultant	8 (42.1)
Matron	1 (5.3)
Professional Nurse	6 (31.6)
<b>Highest academic qualification</b>	
PhD	5 (26.3)
Masters	9 (47.4)
Postgraduate diploma	5 (26.3)
<b>Discipline</b> (some experts are into multiple disciplines)	
Family medicine	3 (15.8)
Urology	5 (26.3)
Oncology	4 (21.1)
Medical education	1 (5.3)
Primary care nursing	4 (21.1)
Nursing education	3 (15.8)
Nursing oncology	2 (10.5)
<b>Years of experience</b>	
10–15	1 (5.3)
16–20	7 (36.8)
> 20	12 (63.2)

**Table 2. Summary of the three rounds of the Delphi study.**

Questionnaire item	Consensus percentage (%)	Round consensus reached
<b>Section 1: ‘Shared decision-making (SDM) for prostate cancer (PCa) screening: What risk factors or criteria should warrant SDM for PCa screening among African men 40 years and older?’</b>		
Men with one or more of the following lower urinary tract symptoms (LUTS): urine frequency, urgency of urine, dysuria, poor stream, urinary hesitancy, dribbling of urine, incomplete voiding, blood in semen, haematuria, painful ejaculation, impotence	94.7	1
Men with one or more 1 <sup>st</sup> degree relative with PCa.	84.2	1
Men with frequent pain or stiffness in the lower back	No consensus	
Men with unexplained weight loss	No consensus	
Family history of breast cancer*	No consensus	
<b>Section 2: ‘Which community health education topics are relevant to enhance PCa screening knowledge attitude and practice (KAP) among African men?’</b>		
Benefits of PCa screening	100.0	1
Risk factors for PCa	100.0	1
Symptoms of PCa	100.0	1
Screening tests for PCa: prostate-specific antigen (PSA) and digital rectal examination (DRE)	94.7	1
Testimony of community members living with PCa or has undergone treatment*	89.5	2
Shared decision-making in PCa screening	84.2	1
Fear regarding PCa screening	73.7	1
Function of the prostate	73.7	2
Disadvantages of PCa screening (false positives and false negatives)*	No consensus	

Fatalism (fatalistic attitude) regarding PCa	No consensus	
Situational barriers to PCa screening	No consensus	

Note: Total of 45 items, consensus reached on 34 items, no consensus on 11 items.

DRE, digital rectal examination; KAP, knowledge, attitude and practice; PCa, prostate cancer; PSA, protein specific antigen.

\*New items suggested by participants during Round 1 and were therefore included in the Round 2 questionnaire.

†Item was suggested during Round 2 and was included in the Round 3 questionnaire.

**Table 2. Summary of the three rounds of the Delphi survey (continued).**

Questionnaire item	Consensus percentage (%)	Round consensus reached
<b>Section 3: ‘Which community health education methods can be engaged to enhance PCa KAP among African men?’</b>		
Audio-visual media, e.g., TV, internet, videos	100.0	1
Testimony of patients in communities. Contact sessions with patients who discuss their experience and disease*	94.7	2
Radio and other audio media	94.4	1
Contact sessions with primary healthcare workers	77.8	1
Literature, e.g., books, leaflets, articles, newspapers	72.2	1
Outreach by health system care coordinators and payer patient navigators*	No consensus	
<b>Section 4: ‘What community strategies should be engaged to enhance PCa health education?’</b>		
Involve women in the teachings, to enhance understanding and to promote support of the affected*	89.5	2
Incorporating PCa health education / promotion into community social gatherings involving men, e.g., religious gatherings, barbershops, barbecues, taxi ranks, etc.	78.9	1
Workplace / worksite-related events for health promotion*	78.9	2

Health education pamphlets would support verbal education and should be provided in the three commonest languages spoken in the community*	73.7	2
Religious leaders, lay health counsellors and owners of community social gatherings should be trained and involved in PCa health education	73.7	1
Traditional leaders can also be used especially those in charge of initiation schools*	No consensus	

Note: Total of 45 items, consensus reached on 34 items, no consensus on 11 items.

DRE, digital rectal examination; KAP, knowledge, attitude and practice; PCa, prostate cancer; PSA, protein specific antigen.

\*New items suggested by participants during Round 1 and were therefore included in the Round 2 questionnaire.

†Item was suggested during Round 2 and was included in the Round 3 questionnaire.

**Table 2. Summary of the three rounds of the Delphi survey (continued).**

Questionnaire item	Consensus percentage (%)	Round consensus reached
<b>Section 5: ‘Which continuing educational topics should be included in refresher courses to enhance PCa KAP among doctors, nurses and community health workers?’</b>		
Shared decision-making in PCa screening	100.0	1
Risk factors for PCa	94.7	1
Symptoms of PCa	94.7	1
Screening tests for PCa (PSA and DRE)	94.7	1
PCa treatment and complications	89.5	1
Prostate biopsy and complications	89.5	2
Function of the prostate	73.7	2
PCa staging and grading	73.7	2
<b>Section 6: ‘Which continuing education methods should be engaged to enhance PCa KAP among doctors, nurses and community health workers?’</b>		
In-service training / workplace learning	94.7	1
Audio-visual media	84.2	1

Develop and disseminate online, accredited training programmes for healthcare providers, patient navigators, and community health workers†	84.2	3
Study materials	72.2	1
Didactic lectures	No consensus	
Practical sessions / simulated learning	No consensus	
Workshops / group tasks	No consensus	
<b>Section 7: Additional suggestions</b>		
Healthcare workers, like other professions, should be responsible for staying up to date with literature in their field*	84.2	2
This subject should be considered for undergraduate teaching, learning and assessment*	78.9	2

Note: Total of 45 items, consensus reached on 34 items, no consensus on 11 items.

DRE, digital rectal examination; KAP, knowledge, attitude and practice; PCa, prostate cancer; PSA, protein specific antigen.

\*New items suggested by participants during Round 1 and were therefore included in the Round 2 questionnaire.

†Item was suggested during Round 2 and was included in the Round 3 questionnaire.

**Table 3. Strategies targeted at African men to enhance the approach to prostate cancer screen, as suggested by experts.**

<b>Strategies targeted at African men</b>			
<b>WHAT health education</b>	<b>HOW health education</b>	<b>WHO health education</b>	<b>WHERE health education</b>
Risk factors for prostate cancer	Print media, e.g. books, leaflets, pamphlets, articles and newspapers	Survivors of prostate cancer in the community	Community social gatherings, e.g. religious gatherings, barbershops, barbecues, taxi ranks
Symptoms of prostate cancer	Translate the above-mentioned to the common local languages	Primary healthcare providers	Workplace
Functions of the prostate	Audio-visual media e.g. TV, internet, videos	Religious leaders	
Screening tests for prostate cancer	Radio and other audio media	Lay health counsellors	
Fear regarding prostate cancer	Contact sessions with primary healthcare providers	Owners of community social gatherings	
Benefits of prostate cancer screening			
Shared decision-making in prostate cancer screening			

*Source: author's own data*



**Table 4. Strategies targeted at primary healthcare providers to enhance the approach to prostate cancer screening, as suggested by experts.**

<b>Strategies targeted at primary healthcare providers</b>	
<b>WHAT continuing education</b>	<b>HOW continuing education</b>
Function of the prostate	Audio-visual media
Risk factors for prostate cancer	Workplace learning / in-service training
Symptoms of prostate cancer	Study materials
Screening tests for prostate cancer	Online training / learning
Shared decision-making in prostate cancer screening	Aspects of prostate cancer screening to be considered for undergraduate teaching and assessment
Prostate biopsy and its complications	
Prostate cancer staging and grading	
Prostate cancer treatment and complications	

*Source: author's own data*