



Original Research

The importance of information, motivation, and behavioral skills (IMB): Healthcare provider perspectives on improving adherence to cervical cancer screening among at-risk women



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ABSTRACT

Objective: To understand the theoretical framework of how information, motivation, and behavioral skills (IMB) independently and collectively affect cervical cancer screening and testing adherence.

Study design: Qualitative study.

Methods: Data collected from three focus groups and seven individual interviews, with 33 healthcare providers, ranging from community health navigators, Ob-Gyn MD's, nurses, care coordinators, medical assistants, and outpatient managers, representing a grassroots community health agency, a large cancer center, and a public sector health clinic. We recruited providers over a five-month period in the summer to fall of 2019. Provider interviews and focus groups were structured with four to eleven participants per group and were audio-recorded. This study was rooted in grounded theory, analyzing data using the iterative process of Coding, Consensus, Co-occurrence, and Comparison to identify common themes.

Results: Emerging qualitative findings include the relevance of information, the interaction between information and motivation, the role of behavioral skills, and the symbiotic relationship between information, motivation, and behavioral skills (IMB). Most notable is this interdependency between IMB components, with the core of this relationship being the critical link of coordinating adherence.

Conclusion: This knowledge will help advance and expand IMB intervention components to improve time to cervical cancer screening and follow-up adherence among at-risk communities. Particularly given COVID-19 barriers, which disproportionately affect at-risk women, this study has practice implications that inform the development of cervical cancer screening practice interventions and strategies to improve adherence, while ensuring safety for both patients and providers.

1. Introduction

Although morbidity and mortality from cervical cancer are largely preventable, through human papillomavirus (HPV) vaccination and cervical cancer screening, substantial disparities in incidence and mortality among low-income, minority women persist [1,2]. Poor adherence to HPV vaccination, cervical cancer screening, and post-screening/diagnostic follow-up recommendations after an abnormal Pap test are key drivers of these disparities [3]. Root causes of poor

adherence in low-income, minority women are multiple daily stressors; fear/anxiety related to a possible cervical cancer diagnosis; and organizational/system-level barriers that make it difficult to adhere to screening and treatment recommendations [4,5]. Furthermore, COVID-19 has created additional individual and organizational barriers to screening; cancer screening like other elective medical procedures, has been put on hold to prioritize urgent needs and to reduce the risk of spreading of COVID-19 in healthcare settings. One consequence of this has been a substantial decline in cancer screening [6–8]. There is an

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urgent need for evidence-based interventions that address these root causes and barriers of poor adherence among medically underserved and under-resourced populations, but few evidence-based interventions exist [9].

There is scant research investigating theory-based behavioral frameworks for interventions to help improve adherence among high-risk, hard-to-reach populations. Information-Motivation-Behavioral skills (IMB) [10] is a well-known evidence-based adherence model that asserts these skills are the fundamental determinants of screening behavior. IMB predicts that to the extent women are well-informed, motivated to act, and possess behavioral skills required to act effectively, are likely to behave favorably (e.g., initiate Pap screening test or complete HPV vaccination). IMB has been primarily used with success to design, deliver, and explore behavior change in HIV and sexual risk prevention literature [11–15]. It has also been used in other disease and population domains, like adherence to Type II diabetes self-care among Puerto Ricans [16], breast cancer screening among Korean women [17], and HPV vaccination among U.S. college-aged women [18]. Additionally, the individual relevancy of information, behavioral skills - “procedural” and “systematic” - and motivation affect women’s cancer screening adherence [8]. Although the model has been successfully used in many illness domains and with other populations, the research gap is that the model has not been used to address adherence to cervical cancer screening nor recommended follow-up compliance among at-risk U.S. women. Thus, a qualitative examination (consisting of both individual interviews and focus groups) is needed to theoretically and collectively understand how information, motivation, and behavioral skills independently and collectively, affect screening adherence. From an emic healthcare provider’s point of view, this is an examination of the validity of the IMB framework.

2. Methods

This research study was a joint effort between the University of Cincinnati (UC) Barrett Cancer Center healthcare providers and the Cancer Justice Network (Cincinnati non-profit community organization that assists underserved individuals receive timely cancer screening and treatment) community health navigators. Healthcare providers and community health navigators were eligible if they were employed by UC Medical Center or the Cancer Justice Network and were ≥ 18 years old. We also based healthcare provider eligibility on having direct clinical contact with diverse women (low-income and/or minority) at UC who were cervical cancer patients, and community health navigator eligibility on having direct clinical contact with diverse women and knowledgeable of women’s health.

We recruited providers over a five months in the summer and fall of 2019. We began our recruitment efforts first by contacting one of the lead physician residents at the UC Barrett Cancer Center and the director of the Cancer Justice Network. We telephoned both to schedule a time to discuss the study. Barrett Cancer Center provider(s) agreed to post recruitment flyers in the clinic suites, on bulletin boards, on entryway tables, and counters to inform healthcare providers of the study. We also developed a recruitment email sent to providers in the clinics. Recruitment material indicated that focus groups would be conducted during lunchtime in a meeting room in the clinic suite. The director of the Cancer Justice Network agreed to assist with recruitment by emailing community health navigators, which indicated that focus groups would be conducted during weekly community health dinners. For those providers that could not attend a scheduled focus group, an individual interview was arranged. Each provider was given an informed consent and a \$20 grocery store gift card and lunch incentives, for their time and participation in completing the entire focus group or interview.

We developed a semi-structured interview guide for three focus groups and seven interviews. The guide consists of six substantive open-ended questions about the influence of NIMBS intervention components. The two lead researchers moderated focus groups and individual

interviews, having knowledge and experience interviewing, group dynamics, and experience with group facilitation. Provider interviews and focus groups were structured with four to eleven participants per group, were approximately 45 min in length, and were audio-recorded. As is best practice in qualitative research after the interview, the interviewer filled out a “data capture form” [19] which included questions about the interviewer’s initial impressions, such as the provider’s demeanor and mood during the interview or focus group; major issues; a brief self-reflective critique of the interviewer or focus group facilitator, and areas for further exploration. No follow-up interviews or focus groups were conducted; providers only participated in one focus group. This study protocol was approved by the Institutional Review Board at the University of Cincinnati.

The qualitative interview data were analyzed using Coding Consensus, Co-occurrence, and Comparison [9] and rooted in grounded theory [10]. All focus group and interview transcripts were analyzed using Atlas-ti. A codebook was initially started with a priori concepts from NIMBS conceptual model and segments of code definitions. Empirical data contained in the focus groups and interviews were independently coded (by senior lead researchers and two research assistants) at a very general level to condense the data into analyzable units. We used a deductive approach to positively confirm the IMB framework. Specifically, segments of transcripts were assigned codes based on NIMBS a priori sensitizing concepts and themes. Based on this general coding, the research team added concepts, codes, and definitions to the codebook as concepts emerged during coding that were not reflected in the initial coding scheme. We then re-coded the transcripts using the revised codebook. Codes were then assigned to describe connections between categories and also between categories and subcategories (e.g., axial coding) [20]. All transcripts were analyzed by the lead researchers and trained research assistants.

3. Results

Data were collected from three focus groups and seven interviews, with a total of 33 healthcare providers, ranging from community health navigators ($n = 8$), Ob-Gyn MD’s ($n = 7$), nurses ($n = 6$), care coordinators ($n = 2$), medical assistants ($n = 8$), and outpatient managers ($n = 2$), representing a grassroots community health non-profit, a large cancer center, and a public sector health clinic. The majority identified as female ($n = 30$). The majority were ages 36–50 (median age 39) ($n = 12$), ages 51+ ($n = 10$), and ages 25–35 ($n = 8$). Providers highest educational level: Bachelor’s ($n = 12$), graduate/professional education ($n = 10$), Associate’s ($n = 6$), or high school diploma ($n = 2$). Most ($n = 18$) had 10+ years of experience and most ($n = 25$) had been personally affected by cancer. Eleven were assigned to predominately prevention or outreach, thirteen to mainly diagnostic, and nine to cancer treatment care.

Information. When we examine the individual relevance of information, healthcare providers (HCP) discussed the importance of educating through awareness prevention and “catching it early.” They described the importance of “just being aware of what happens in the family, getting regular Pap smears and breast exams, just doing preventative measures to detect it early” (*Access Coordinator, 4-year HCP*). Another provider echoed the importance of awareness as a prerequisite of knowledge and understanding. This provider felt that the lack of awareness was more pervasive in our culture:

“I feel like the cervix is not discussed. It’s like ‘don’t talk about it.’ It’s just like the media does not give cervical cancer the awareness it should. More people know about information about STD’s, than to get Pap smears or to see the gynecologist or to get your vaccines. People don’t want to talk about it or people say not to mention it” (*38-year-old female MD Resident, 12 years as a healthcare provider*).

HCP’s described misunderstandings as an important informational

barrier, contributing to women’s non-adherence. One provider reports that before procedures, asking, “What are you having today? Unfortunately, they find the ‘vast majority can’t even tell us, after we’ve counseled them, and they’ve signed a consent form”, agreeing to the procedure. It’s a lack of understanding of the whole process (*Medical Assistant, 14-year HCP*).

Misunderstandings may also cause underlying psychological reactions (i.e., fear, “overwhelmed”, “very nervous”). One provider explained the fear related to misunderstanding when patients are advised to come back for a diagnostic test:

“One of the biggest hurdles is the misunderstanding that patients have if they think they have cancer ... but when we look at the records, they actually had an abnormal Pap smear and cervical dysplasia ... But they think it’s cancer and they are scared” (*Gynecologic Oncologist, 12-year HCP*).

Other providers acknowledge that when patients are in treatment, they often feel overwhelmed by the amount and degree of information, which translates into misunderstanding important information:

“Sometimes patients don’t understand what’s being said and don’t want further clarification ... Say, ‘you will have to get so much radiation or so much chemotherapy,’ it doesn’t really register, because over a period of time they have to follow up..., so I don’t know if they get tired of hearing what’s being said, not understanding it and not wanting to be involved in it for such a period of time. It’s overwhelming to them” (*Medical Assistant, 20-year HCP*).

The Interaction between Information and Motivation. Providers also describe women’s attitude and generalized lack of motivation as a factor contributing to adherence. For example, this provider describes the lack of interest in chemotherapy cancer treatment: “Sometimes they’re just tired and don’t want to do it. And a lot of times, it is recurrent. They get tired of the process or side effects from the chemo.” (*Access Coordinator, 4-year HCP*).

Results show a distinct interaction between both information and motivation. The following quotes describe this relationship between information and motivation, affecting adherence:

“There’s a loop between information and motivation. We find patients who think they have the information and then they come in because they have an abnormal smear and they have the motivation to learn about their cervix. When I teach them again, I feel like it sinks in more and then from that, they will have behavior change. Hearing information first allows them to come in and it isn’t until they have an abnormal one, that they have the motivation to learn and make a change” (*Gynecologic Oncologist Resident, 3-year HCP*).

“On the other side from the arrow from motivation down is sort of the adverse experiences. So I’ve had a bad Pap that kind of leads to motivation and sometimes they don’t have the information at all or they have misinformation but they still have the motivation to allow for a motivational change because they have something bad in their past” (*Gynecologic Oncologist Resident, 4-year HCP*).

“If they’ve had a bad Pap that leads to motivation, but they don’t have the information or have misinformation, but they still have the motivation to change because there’s something bad in their past. They go to the ER because of abnormal bleeding and have a Pelvic exam. They believe they are set because the physician said everything is fine. So, the women think they got a Pap smear, but they didn’t get a Pap because that is not always done. So, there is a lot of misinformation, where they may have the motivation to make sure everything is okay, but they don’t have the information to advocate for the right tests and evaluation” (*Administrative Assistant, 20-year HCP*).

The Role of Behavioral Skills. A few providers discussed how the lack of knowledge of procedural behavioral skills contributes to adherence

issues. Procedural behavioral skills involve information or knowledge that women had [8] related to getting a Pap screening. One provider did admit that staff communication may contribute to poor behavioral skills:

“Are we even making sure that they know what we are doing? Because I am not even sure we do a great job of that. And it is on the physicians’ also. I think sometimes we get so busy and we have so many patients, we just do the procedure and just think they know what we are going to do” (*Clinical Manager, 18-year HCP*).

The Interaction of Information, Motivation, and Behavioral Skills.

Results not only reveal the individual relevance of each of the IMB components and the relationship between information and motivation, but also suggest an interdependency between components, and at the core of this relationship is the critical link of coordinating adherence efforts:

“I think it takes all of it, and information being a good part; but you know they get overwhelmed with so much information...and that does affect their behavioral skills ... (for example) how do I get here? Motivation is definitely necessary so we can help them ... and that really helps their behavior skills, because if you are motivated and encouraged with the resources or offer to help them through it, that helps them develop (behavioral) skills that affect behavior change (adherence)” (*Access Coordinator, 43-year HCP*).

Fig. 1 illustrates the adapted model that shows the circular interactive nature of the IMB adherence model.

4. Discussion

This study found that the individual relevancy of information, motivation, and behavioral skills affects cervical cancer screening adherence. However, there was less discussion about the influence of behavioral skills. During interviews and focus groups, attempts were made to elicit perspectives for behavioral skills, but a few explicitly discussed this concept independently. This might either reflect a limited understanding of how behavioral skills concepts were explained in the interviews or focus groups, or that participants did not feel as strongly about the concepts’ independent influence in the model.

Providers stressed that IMB elements were not only important and

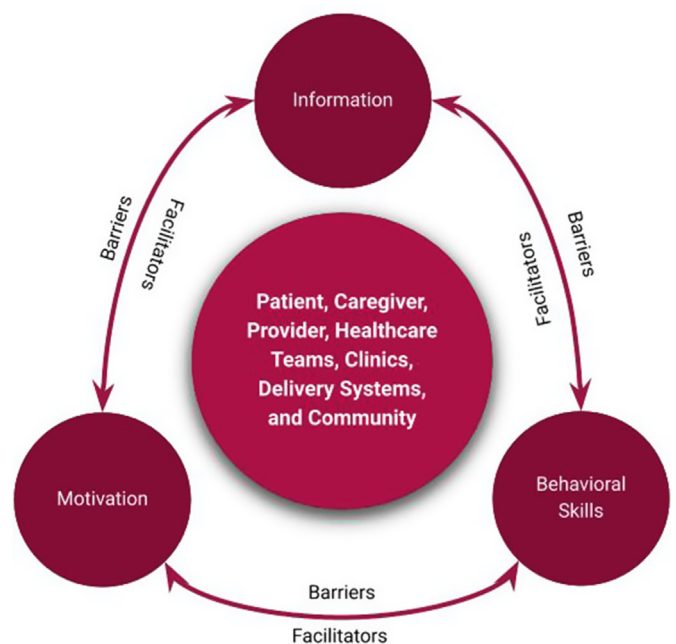


Fig. 1. Adapted circular IMB adherence model.

relevant to public health practice individually, but there was an interdependent and dynamic relationship between information, motivation, and behavioral skills. Consistent with earlier studies of the IMB model [7], correct information is critical to motivation, and vice versa; and information and motivation are believed to work largely through the activation of relevant behavioral skills to bring about adherence. An important contribution of our results is that there seems to be a dynamic “circular” relationship, rather than the traditional linear IMB model, which means that we need to target public health practice intervention approaches to all three components simultaneously.

A critical feature of the model for this population is the importance of identifying basic needs [11] related to barriers and facilitators [21–23]. According to Maslow (1970), having unmet basic needs results in anxiety or tension and a drive to relieve it. Only when this tension is relieved, can a woman focus on higher order needs, like adhering to Pap screening recommendations [24]. For this at-risk population, it might be most important to flexibly address each IMB component, whilst problem-solving barriers and identifying strengths and facilitators. Finally, at the core of this IMB relationship are the multi-levels of intervention: patient, caregiver, provider, healthcare teams, clinics, delivery organizations, and community. All of these elements collectively require targeted coordination and teamwork, to help improve time for cervical cancer screening and follow-up among at-risk communities.

Despite the strengths of this study, it also has a couple of important limitations that need to be acknowledged. The interviews and focus groups were retrospective in nature. At times, there was poor recall initially of the influence of behavioral skills in the recollection of screening adherence obstacles. Also, this sample may be somewhat biased, as it included mostly healthcare providers who were recruited within similar healthcare systems and community social networks. Although this does limit the generalizability of the sample, it speaks to the importance of these networks in disseminating information.

5. Practice implications

Although for many of us in public health, it is no surprise that the COVID-19 pandemic amplifies what we already know about existing outcome disparities in at-risk women. The crisis has created additional barriers and resulting practice implications, as cervical cancer screening programs have curtailed. Additionally, many providers in clinics and low-resource community settings have reallocated their providers or have sent them home due to lockdown mandates. As such, cervical cancer screening has temporarily stopped being a priority for at-risk women. This highlights the relevance of new information on risk-benefit screening recommendations; the interaction between such information and the motivation to screen given ensuring safety for both patients and providers; the role of additional behavioral skills during screening (i.e., wearing a face mask, handwashing, use of hand sanitizer by patients and providers, etc.); and the important symbiotic relationship between information, motivation, and behavioral skills, both during and after the pandemic.

6. Conclusion

Findings serve as a theoretical guide for the adoption of a future adapted model that improves upon classic IMB. This knowledge will help advance and expand intervention components to improve compliance with cervical cancer screening and follow-up recommendations among at-risk communities. Given the unique features contributing to poor adherence for these populations, it was important to target and tailor culturally sustainable adherence interventions.

Ethical approval

This study protocol was approved by the Institutional Review Board at the University of Cincinnati before conducting the study.

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Declaration of competing interestCOI

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

Credit author contributions

Anjanette Wells: Conceptualization, Methodology, Formal Analysis, Writing-Original, Formal Analysis, Supervision.

Vanessa Allen-Brown: Conceptualization, Data Verification, Writing-Reviewing/Editing, Supervision.

Nadia Alam: Literature Review, Data Management/ Tracking, Formal Analysis, Writing-Reviewing/Editing, Resources.

Caroline Skulski: Literature Review, Data Management/ Tracking, Resources.

Amanda Jackson: Conceptualization, Writing-Reviewing/Editing, Supervision.

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