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More than Milk: Young-Adult Women's Osteoporosis Disease Awareness and Prevention

Julie E. Volkman, Ph.D.
Emerson College

Carla L. Fisher, Ph.D.
George Mason University

Julie E. Volkman, Department of Communication Sciences and Disorders, Emerson College; Carla L. Fisher, Department of Communication, George Mason University.
Correspondence concerning this article should be addressed to Julie E. Volkman, Department of Communication Sciences and Disorders, Emerson College, 120 Boylston Street, Boston, MA 02116. E-mail: julie_volkman@emerson.edu

Abstract

We engaged in a study as a first step toward understanding young-adult women's perceptions of osteoporosis and awareness to guide future awareness efforts. Women in young-adulthood represent an ideal time in the life span to discuss bone healthy behaviors to prevent the development of the disease. Forty women aged 18-33 participated in six focus groups in which they revealed their perceptions osteoporosis within their age cohort and recommendations to improve future messages. We conducted thematic analyses and findings demonstrate that although young women perceive susceptibility of osteoporosis, they still deem it unimportant. Awareness messages must be tailored to the unique needs of this age group to enhance young women's motivation to engage in bone healthy behaviors.

Keywords: focus groups, young adults, women's health, communication, osteoporosis

Osteoporosis is a serious disease affecting Americans, with women four times more at risk than men (Surgeon General, 2004). In the United States alone, 10 million individuals already have osteoporosis and 34 million more have low bone mass, placing them at increased risk for this disease (National Osteoporosis Foundation [NOF], 2010). The disease is linked to more than 1.5 million fractures annually (NOF, 2010), and is being studied as to its connection to the development of tooth loss and jaw-related health issues (Kelsey & Lamster, 2008) and increased risk of cardiovascular mortality (Von de Recke, Hansen, & Hassager, 1999). There are also social, cultural, and economical ramifications of osteoporosis that affect the life of communities and the entire nation (Ilich, Badenhop & Matkovic, 1996). Over the next 20 years the number of osteoporotic fractures will increase exponentially due to the aging population (Hawker, Jamal, Ridout, & Chase, 2002).

Despite the consequences of osteoporosis, some individuals still do not perceive the disease to be serious, particularly those in early adulthood or 18-25 years old (Johnson, McLeod, Kennedy, & McLeod, 2008). Such findings accentuate the need to focus on age groups where lifestyle habits may be developed early and, hence, more likely to be sustained throughout one's lifetime to control the future incidence rate of osteoporosis. Specifically, the Surgeon General (2004) emphasizes there is a need to focus awareness efforts on young-adult women in addition to women of pre- and post-menopausal ages. Therefore, we begin a line of research to learn what perceptions and recommendations are related to osteoporosis awareness and prevention that will be most efficacious in managing this disease by engaging in early-life communication efforts that target this age group.

Communicating Osteoporosis to Young-Adult Women

Considering that behavioral patterns and beliefs developed early in life can continue across one's life span (Pecchioni, Wright, & Nussbaum, 2005), communicating to young-adult women about this disease has become a public health priority (Surgeon General, 2004). The management of peak bone mass is related to habits women employ across the life span (Friedlander, Genant, Sadowsky, Byl, & Gluer, 1995; Wang et al., 1999), even though almost all adult bone mass is acquired by age 18 (NOF, 2010). In particular, bone healthy behaviors such as calcium and vitamin D intake and weight-bearing exercises initiated earlier in life can help decrease chances of being diagnosed with osteoporosis (Surgeon General, 2004). This early initiation of bone health behavior becomes even more critical in light of findings from a 12-year prospective study of women ages 34-49 suggesting that high intake of calcium rich food during midlife will *not* substantially prevent fractures (Feskanich, Willett, Stampfer, & Colditz, 1997). Thus, these practices must be initiated much earlier. Yet, research demonstrates that adolescent to emerging young-adult females (ages 14-19) still may not be consuming enough calcium, thereby potentially increasing their risk in developing osteoporosis (Ali & Siktberg, 2001). Collectively this research suggests that adolescent girls and young-adult women are still either ill-informed about their osteoporosis risk and prevention, or are not "hearing" or being influenced by current health messages.

To contribute to disease prevention, messages must be developed that target young-adult women. While the aforementioned research demonstrates that medically this is still a highly influential period in life, it is also a prime period to influence women's cognitive awareness and adoption (or continuance) of bone healthy behavior. Emerging and young adulthood are very impressionable developmental periods in which young women are forming their own opinions and worldview, adopting behaviors, making independent decisions, and learning who they are (Arnett, 2000, 2001). As such, messages that target this age group can be key in expanding

women's awareness and contribute to disease prevention. Yet, this feat is not without challenges as scholars acknowledge that communicating to young adults about health can be quite difficult. In particular, young adults "may feel invulnerable to bad health and have no need to listen to health messages. Special attention must be given to novel methods with which to capture the attention of young adults," (Pecchioni et al., 2005 p. 181). Compounding these perceptions is the nature of osteoporosis often being diagnosed later in life (Surgeon General, 2004; Johnson et al., 2008), and bone health not being an issue often discussed to young adults compared to sexual health or influenza outbreaks or other health concerns that may directly pertain to their current lives. Such considerations are evidenced in prior research findings that indicate young women believe osteoporosis is not a risk for them (Johnson et al., 2008; Kasper, Peterson, Allegrante, Galsworthy & Gutin, 1994; Kasper, Peterson & Allegrante, 2001).

Therefore, in order to improve osteoporosis awareness and prevention communication to young-adult women, we should better understand their current perceptions and needs in young adulthood. Often it is recommended to first speak with the target audience to address all factors that could influence a health behavior (Austin, 1996) and conduct in-depth audience analysis for health behavior change (Kotler & Lee, 2008). A few studies have been conducted to understand osteoporosis, in terms of education awareness, that can inform communication endeavors. A study in Thailand of later adolescent and young women (ages 17-21) showed that self-efficacy and knowledge could result in calcium and exercise prevention behaviors (Piaseu, Schepp, & Belza, 2002). Only the belief of osteoporosis being a highly visible or disfiguring disease prompted some 16-25 year old women to report increasing their intentions towards preventing the disease (Klohn & Rogers, 1991), indicating visual representation of how the disease changes women's physical appearance may be a plausible message approach to influence this audience's health promotion behavior.

Clearly, this provides some guidance on developing osteoporosis health messages. But, in order for young women to be more likely to engage in osteoporosis prevention health behaviors, the information presented to them must grasp their attention, be understood, and retained in order to move toward behavior change (McGuire, 1972). Formative research efforts conducted prior to creating health messages are often guided by theories and models to understand psychological and cognitive differences among individuals that can influence their perceptions of health issues and behavior change. In particular, the Health Belief Model (Janz & Becker, 1984) assists us in understanding what content may begin these processes towards osteoporosis behavior change, especially in terms of their perceptions of susceptibility and severity of osteoporosis and their confidence in performing osteoporosis prevention (i.e., self-efficacy). The model posits that if perceptions of susceptibility and severity are high enough but do not exceed self-efficacy assessments, behavior change may be adopted (Janz & Becker, 1984). The HBM also states that external cues (Janz & Becker, 1984), such as media information or campaigns, can influence perceptions of the overall threat. Thus, when communicating about osteoporosis prevention to young women it is important to consider the media messages and influence of the aforementioned external cues on young women's readiness to engage in osteoporosis prevention behaviors.

Since research shows young women still lack adequate knowledge and awareness of osteoporosis and its associated risk (e.g., Johnson et al., 2008), HBM is an applicable theoretical model that can help us better understand young women's risk perceptions and message preferences. Attaining knowledge from this approach will be useful in enhancing future prevention message design that targets this age group. We can learn more about the appropriate

content and communication to be utilized in future message construction, including key design aspects like target audience preferences and channels. Capturing young-adult women's perceptions about the disease, in *their* words, is an important first step in attaining knowledge to construct messages that are most efficacious in enhancing women's disease and prevention awareness. Therefore, the following inquiries are posited:

RQ1: What are young-adult women's perceptions of osteoporosis?

RQ2: What are young-adult women's recommendations on an osteoporosis health message for their age group?

Method

In order to elucidate young-adult women's experiences from their own perspective, we employed an interpretive design that included facilitating focus groups to explore young-adult women's insider experiences. Focus groups are often used in health communication and prevention efforts to understand more about an audience and gain in-depth knowledge (Edgar, Freimuth & Hammond, 2003). This method is particularly useful because it allows for a wide range of ideas regarding the topic of interest that may have not emerged through other data collection techniques (Kroll, Barbour, & Harris, 2007; Morgan, 1997; Stewart, Shamdasani & Rook, 2007).

Participants

A total of 40 females in six focus groups participated in the study, ranging from 18-33 years (M = 20.73).[1] The majority of participants self-reported to be Caucasian (n = 27; 68%). Five (12.50%) participants self-reported as African-American and three (7.50%) as Asian. Two (5%) participants stated their ethnicity as Hispanic and three (7.50%) participants self-identified themselves as "Multi-racial," "Human" or "East Indian." All participants were attending college with 40% (n = 16) as "juniors." There was an average of six participants per focus group.

Recruitment and Procedure

Prior to conducting the focus groups, Institutional Review Board (IRB) approval was granted at large northeastern university. Participants were recruited via convenience and snowball sampling of general undergraduate classes. Classrooms were visited to invite interest among young women ages 18-30 to participate in a focus group setting about health messages, and a flyer was distributed asking interested participants to email about participation. Inclusion criteria included being a female and between the ages of 18-30 to capture all young-adult women attending the university. Young women were told the focus groups would be audio-recorded and that information shared would remain confidential. Focus groups times were varied to allow flexibility to attend, and sessions were held at conveniently located on-campus classrooms. To encourage attendance, we reminded participants via email of the focus group time and location 24 hours prior to the focus group.

Once all participants arrived and seated in a circle format at the designated time for the focus group, signed informed consent was obtained. Each participant was given a copy of the consent forms. The focus group discussion then began using a moderator guide. Each focus group was conducted by the same female moderator (using the same guide) who has been trained in conducting focus groups. The moderator guide was designed to facilitate discussion among young women concerning bone health and osteoporosis. It consisted of open-ended topic prompts arranged using a semi-structured funnel guide based upon previous osteoporosis research (Surgeon General, 2004) and variables in the Health Belief Model (Janz & Becker, 1984) to provide a wide range of perceptions young women may have about the disease to address the first research question. To address the second research question, women were asked

to recall osteoporosis awareness messages including specifics about design choices (e.g., target audience, channel used), as well as what would be their recommendations on future osteoporosis awareness messages aimed at their age group. See Table 1. Additional probing questions (e.g., can you give me an example) were employed to gain a desired depth of information.

Table 1.
Moderator Guide Questions

Questions
1. Has anyone ever discussed bone health with you?
2. Have you ever read anything about bone health?
3. What do you know about improving bone health?
4. What do you know about calcium use?
5. Currently, is calcium a part of your diet? Exercise?
6. In the past, was calcium use a part of your diet? Exercise?
7. Have you ever heard of osteoporosis?
8. Have you ever been worried about getting osteoporosis? Why or why not?
9. Can you control your chances of getting osteoporosis?
10. Is there a connection between bone health and calcium? Between bone health and exercise? Between bone health and healthy eating?
11. In your opinion, what health topics are important to women your age?
12. In your opinion, what are bad and good elements of a health message? An osteoporosis message?

After each focus group was completed, the recording was stopped and the young women were asked to fill-out a demographic questionnaire. Young women were debriefed and then received an honorarium of $10 or extra credit toward their class participation to compensate them for their time. An informational brochure from the NOF was provided to young women as a future reference about osteoporosis in case participants had additional questions. Focus groups lasted approximately one hour in length. Focus groups were transcribed verbatim resulting in 92 single-spaced pages of data. Each participant was assigned a numbered entry to ensure confidentiality of comments.

Analytical Process

We used the constant comparative method to analyze the data for emergent patterns in women's experiences (Strauss & Corbin, 1990). Three steps outlined by Strauss and Corbin (1998) were used. First, conceptual codes were assigned to text. After an initial reading, preliminary open codes were marked alongside transcripts to capture concepts being said by participants. Second, categorical assessment was initiated. Transcripts were then read again to exhaust all possible open codes. To group the open codes, categories were then created by grouping codes into a higher order concept. Lists of concept codes for each category were compiled to determine "thematic salience." Thematic salience was reflected in recurrence, repetition, and forcefulness (Owen, 1984). For the recurrence criterion, themes were determined when more than half of women reported the experience. The final analytical step involved refining categories. A second researcher read through the categories and coding to ensure fidelity to the statements. Transcripts were then re-read to ensure all codes represented the emergent categories. The categories were reviewed to identify similar ideas and for descriptive purposes in the presentation of the findings.

To ensure trustworthiness and rigor of the study design and findings—hence, the study's usability—verification strategies were used throughout the research process (Morse, Barret, Mayan, Olson, & Spiers, 2002). As Strauss and Corbin (1998) recommend, analyses were conducted concurrently with data collection. This verification strategy allows the researcher to be flexible and responsive throughout the research process and maintain an active analytical stance by attending to thematic saturation and determining that sampling is adequate. Conceptual, operational, and reflexive memos were also kept and when possible, theme labels were generated *in vivo* or using participants' wording and phrasing. Additionally, to ensure transferability of the analyses, the findings were presented with thick, rich description (Creswell, 2007).

Results

Research Question 1: Perceptions of Osteoporosis

Research Question 1 explored women's general perceptions about osteoporosis. Findings were grouped into two main categories: a) general beliefs about the disease risk and b) general beliefs on barriers toward prevention. Within the first category, several subcategories of beliefs emerged including beliefs about *bias towards females, threat to independence,* and *the role of family rituals*. These college-age women also identified perceptions that emerged as several subcategories of specific beliefs on barriers to osteoporosis prevention behaviors: *onset of disease* and *peer communication*. Following are women's perceptions of osteoporosis beginning with their beliefs and followed by their perception of barriers.

General beliefs on disease risk.

Findings suggest young women are aware of osteoporosis, yet maintain specific beliefs about the disease especially in terms of risk. These beliefs seemed to center around disease susceptibility, severity, as well as disease prevention. The emergent themes within this category suggest that young-adult women perceive susceptibility to osteoporosis in relation to being female or having an afflicted family member. Additionally these women are aware of the disease severity in a specific context, particularly how it disrupts an independent life. Interestingly, women discussed prevention within the context of family rituals or behavior. These subthemes or subcategories are explicated below.

Bias towards females.

When asked about their perceptions of osteoporosis and susceptibility of the disease, young women's beliefs about risk of osteoporosis emerged in several ways. One way was in relation to being female. While participants acknowledged that osteoporosis occurs in more women than men, young women felt susceptible to the disease in terms of sex more than any other risk factor. For instance, one participant said, "I still feel like I'm at risk just because I'm a girl, a woman" and another participant stated:

> I think women are targeted the most … They just are. I mean, I'm sure that it is a risk for men, but my perception about the way it's been taught to me that it would only affect women, osteoporosis.

Sometimes this belief of a risk towards women was exasperated if a female family member had the disease. Hence, beliefs were also framed in relation to the participants' female association with other women in the family at risk. One woman stated, "So, I've thought about it because knowing that my nana is starting it [osteoporosis] that is possible that I may get it someday too." Similarly, another participant reflected on this female family member association but added another layer: aging. The following woman demonstrates this in her statement, "Well, I know my grandmother has it so I always think like older women." Some participants also framed susceptibility by talking about osteoporosis as being part of the general aging process. In

other words, everyone was susceptible. For instance, one woman stated, "I agree that you can like live your entire life without osteoporosis. But at one point when you do get older, at some point your bones will deteriorate without your control."

*Threat to independence***.**

Young women further expressed perceptions about disease as part of limiting their level of independence and autonomy, which was contributed to their thoughts on having the disease and its outcomes. In other words, for this age group, the loss of daily functioning relates to the severity of the disease. In each focus group, young women described not being able to walk because of osteoporosis as their perception of having the disease. As one woman said, "Because if you have like weak bones that it's gonna affect your life and doing everyday things." Similarly, a woman stated, "Because their bones get really brittle, that it's easier to break a bone, so like older people if they break a hip they're less likely to live independent." Participants often linked independence and bone deterioration as a part of the consequences of the disease. The thought of bones deteriorating due to osteoporosis conveyed a sense of permanence to the participants. For instance, one participant said, "You can't reverse [bone loss], like once it's started, it's gone." Another one stated, "I think it's bad [bone loss], pretty severe."

Role of family rituals.

Interestingly, family rituals of healthy eating contributed to young women's beliefs and perceptions of osteoporosis, and what they associate with the disease. Women talked about calcium intake as part of good health and an explicit example of osteoporosis prevention and what they perceive as a part of osteoporosis awareness. In particular, young women stated that osteoporosis prevention behaviors may have been against their personal wishes, but were a clear part of the family's eating behaviors and a family social norm. One participant recalled that, "My mom's always like worried about it, and always wants me to take vitamins and stuff". Another participant stated, "My parents always forced me to drink [milk] at like dinner and stuff like that," while another stated, "My parents always bugged me as a kid to have a glass [of milk]. Like you had to have it with dinner."

*General beliefs on barriers towards prevention***.**

These young-adult women also mentioned specific barriers to osteoporosis prevention behaviors. These beliefs centered around the idea that osteoporosis is a later life disease in addition to the influence of their peers' communication about osteoporosis. These barrier beliefs mentioned influence young-adult women's likelihood to engage, or pay attention to, osteoporosis prevention information. Each subtheme is described below.

Onset of disease.

One of the most striking barriers toward engaging in osteoporosis prevention was the belief that the onset of osteoporosis typically occurs later in life. Young women described osteoporosis as a relatively inconsequential disease compared to other potential health problems affecting them because of this later onset of the disease. For example, one woman stated, "I don't think it's on the mind of college students. I mean it's not an immediate thing, you're not gonna die tomorrow of it" Women seemed to connect a late life onset of the disease with an idea that it wasn't an issue or concern for them in their current age. As one participant said, "You really don't see bone health problems killing people everyday, … There are other worse diseases that can happen to you." Another student shared a similar perception even though she seemed to have an idea of the implications of her behavior today:

> I think another thing is that you can't see the results for years now … I should plan for the future, but right now, I'm not going to have osteoporosis tomorrow hopefully, but I'll see that 20 or so years down the road and I'm not thinking about that right now.

This perception of the disease not being a concern today because of the late onset seemed to heighten women's ambiguity to their concern or interest in the disease at this stage of their life. Some young women seemed to find it to be an uninteresting topic. For instance, one participant stated, "I think with anything really severe, starting off with a big paragraph like 'bone health' I don't really want to read this right now." In addition, other young women highlighted an ambivalence to the disease saying, "I don't really like read stuff on bone health but like it's not something I'm interested in" or "I guess I just have this kinda naïve thing about calcium and whatever and you need to eat it whatever, I just have this whatever attitude about it."

Peer communication.

Young women also stated that peers conveyed messages that were barriers to preventing osteoporosis and contributed to their beliefs and perceptions about osteoporosis. They described their peer's negative communication in relation to bone healthy behaviors (i.e., calcium consumption). Specifically, they mentioned peers characterizing bone health behaviors as unpopular or strange and disclosed peer communication as an explicit example of negative communication. This presented a shift from the family social ritual and expectation to drink milk, suggesting that peer communication may compete with family practices. Statements suggest that participants who do drink milk are ridiculed for their decisions and the specific communication further enhanced beliefs, thus presenting a barrier. For example, participants stated, "I still drink milk with dinner. I drink it like literally everyday. And when I go to the [main dining common], I always get milk. Everybody always makes fun of me, but I won't drink anything else" and "My roommates laugh at me, but I'd be happy having crackers and cheese for dinner." One participant stated that when she was taking calcium supplements at camp, friends said "Why are you taking calcium supplements, you're not old?"

RQ2: Osteoporosis Messages and Awareness

Research Question 2 asked young women to express their thoughts on current osteoporosis messages and desires in creating new awareness messages to increase their involvement in osteoporosis prevention. Three main categories emerged from statements: a) *problems with audience relevance*; b) *mass and interpersonal communication*; and c) *evidence within osteoporosis awareness messages*.

Problems with audience relevance.

When asked to recall current osteoporosis messages, young women specifically mentioned that commercials and pamphlets are the most common evidence of seeing osteoporosis. Participants stated that these materials, however, are only made relevant to older women. Thus, this seemed to re-enforce their belief in the disease not affecting them. One participant stated, "Occasionally I see in the doctor's office brochures and stuff. But they usually target like older people, so I usually don't pay attention half the time." Another participant said, "But the commercials, it's always like 30 and up and never our age and never relate to it, so you watch it and you're like 'Oh, I don't need to really worry about it'". In addition, one participant stated, "Those commercials for osteoporosis called Os-Cal[2] [with older women]." Regarding the commercials, young women felt that they were perhaps being misinformed. One participant expressed, "I feel like everything they have now is geared toward specific milk or calcium." Young women feel this is a problem and concern as they may be missing important health information about osteoporosis.

Young women further conveyed potential problems with the framing and targeting of current osteoporosis messages as being inappropriate for their age group. Specifically, participants expressed a lack of desire and motivation to engage in osteoporosis discourse because messages are not framed or targeted towards their age group. Many comments emphasized that current bone health messages ignore young women as a target audience. For example, one participant stated, "Like why when we're talking like now when we're talking about bone health we don't even hear about what bone health is because they don't cater to us, like our age group." One participant summarized,

> And, like I think they should try to focus on people like our age and like preventing it before it starts. I feel like now they focus on once you have it, preventing it from getting worse. But like try to prevent to us, too.

*Mass and interpersonal communication***.**

In response to questions asking for recommendations to communicate future osteoporosis awareness messages to them, young women advocated for mass media methods through advertisements, while others preferred more interpersonal means of osteoporosis awareness (e.g., "I mean unless my doctor said, 'You at 21 needs to worry about osteoporosis.'" and "And like [my] parents."). Only one participant specifically mentioned commercials about osteoporosis: "If they came out with commercials that directed towards teenagers like us and children our age, I think I would be more passionate about [osteoporosis]." Young women stated they feel attention would be given to osteoporosis information shared in print sources. Specifically, young women stated articles and advertisements in magazines would be attention-getting. One participant felt:

> I think if you want to get relevance to us, you want to put it in something like *Elle* or *Marie Cla*ire. If it made it to that magazine, it should be something that we should be looking at right now."

Another participant stated, "I mean I probably wouldn't pick up a [pamphlet]. So if it was something more direct in like *Cosmo* about bone health or something … So that's why you assume it pertains to you." This was further echoed with another woman stating a preference for mass communication in the form of "an ad in like *Fitness*, or *Seventeen*."

Evidence within osteoporosis awareness messages.

To increase the targeting of osteoporosis awareness to young women, young women provided recommendations on the evidence, or how information can be conveyed in an osteoporosis message. In particular, young women felt they did not know enough about what is osteoporosis and, thus, desired more specifics on the disease. In order to learn more about osteoporosis, participants specifically discussed favorable attitudes towards visual and statistical content features within awareness messages. For example, one participant recounted the benefits of seeing a visual depiction comparing bone densities:

> It was so visual, that I always remember it … They showed like an X-ray of a young person and like an older woman and they like showed like how the bone would deteriorate. It was a huge difference because she lacked so much calcium growing up.

Other participants, however, stated a wish to have factual and statistical information presented to them about bone health. Participants wanted message features of recommended actions to be explicit and clear for them to follow (e.g., "Suggestions or like behaviors and stuff like that and how much you need to consume to prevent it from happening." or "One out of 10 can get it."), or quick attention getters (e.g. "Like, 'Have you had your vitamin D today?' Like just a little snippet of osteoporosis and like facts about it, like people would definitely read it."). Many participants also wanted to have young women like themselves discuss osteoporosis. In particular, women suggested seeing "someone our age" or that "it would be good to use an

average person" and "someone who experienced it." One participant specifically stated: "Somebody athletic, young and athletic." Women seemed to want actors or characters they could identify with, see themselves in. Still, young women were conflicted about the use of a celebrity experience to educate about osteoporosis. Young women thought the use of celebrities could be perceived as an endorsement of a product, rather than a spokesperson for disease awareness. For instance, they mentioned the appeal of Michael J. Fox's efforts for Parkinson's disease because he was diagnosed with the disease and also promoting awareness, education, and resources to find a cure.

Discussion

This research is an attempt to understand current bone health and osteoporosis related perceptions among young women and suggestions for future osteoporosis awareness messages and answer a call to target osteoporosis awareness to younger women (Johnson et al., 2008). Young women clearly indicate competing tensions about bone health's importance and a lack of targeted awareness messages to them about this disease. Most notably, young women relay that they currently find osteoporosis to be threatening and severe, but not important to them at their current point in the life span. The implicit value of osteoporosis affecting only older women is being communicated by peers and mass media messages as external cues that influence perceptions of the disease, and the belief that young women do not need to worry about the disease are examples of negative attitudes toward osteoporosis prevention. The lack of awareness about several osteoporosis risk factors indicates there is still much needed on educating about the disease. Furthermore, the lack of immediate ramifications is enabling young women to dismiss current osteoporosis public health messages. Notably, young women state that calcium is considered a form of osteoporosis prevention, and lack of calcium can contribute to poor bone density. Interestingly, though, young women did not mention a relationship toward dieting or birth control methods and osteoporosis. Research is exploring how low-dose formulations used during adolescence (the age of peak bone mass acquisition), could suppress normal bone mass development (Pikkarainen, Lehtonen-Veromaa, Mottonen, Kautiainen & Viikari, 2008). Considering the large number of later adolescent girls and young-adult women currently taking oral or injectable contraception, this is an important element. Thus, there remains ample opportunity for osteoporosis awareness efforts to increase young women's education and prevention habits.

This study also demonstrates that young women do have suggestions and valuable insights to assist future osteoporosis awareness efforts aimed at them. Moreover, they do express a desire to know more about the disease. Statements indicate that family health and family behaviors are an explicit catalyst toward young women understanding and acknowledging bone health in their lives. Osteoporosis awareness messages, thus, may want to incorporate a familial appeal to reach this audience. A familial approach could be a unique way to capture their attention, especially if following participants' recommendations on using articles in popular women's magazines that have a readership of young-adult or teenage women. Young women are optimistic that this form of awareness would garner attention, and possibly motivate them towards prevention behaviors. Participants are clear, though, that this information remain simple and clear. Such a recommendation is interesting, as previous research suggested that conveying health information too simply can have a negative impact on communicating to young-adults (Austin, 1996). Women also advocate for messages that are relatable (i.e., from the perspective of other young women) and trustworthy (e.g., from a credible source not just another celebrity with no association with osteoporosis).

In addition, the focus on family could be tied to knowing one's health history. Research proposes that the ability to discuss health history is a critical skill that can help prevent numerous diseases (Guttmacher, Collins, & Carmona, 2004). In light of this, bone health messages may be enhanced by incorporating the value of discussing osteoporosis as part of knowing health history and improving health outcomes. This emphasis on health history could enable inclusion of other risk factors for osteoporosis such as smoking. As part of these messages, though, it is critical to emphasize that calcium, vitamin D and weight-bearing exercises are prevention behaviors. From this study, it appears there is a need to move further in their prevention knowledge.

The women's experiences in this study also imply that future awareness messages and efforts should incorporate the implicit and underlying social value of being healthy and having independence to be with friends and family. Research suggests that an individual's behavior is influenced by the social groups where they participate (Earp et al., 1997; Giles, Coupland, & Coupland, 1991). The need to be healthy and independent could represent a critical component of women's social identity, particularly given the importance of being independent as a young adulthood developmental task. As such, in developing future awareness messages this message of independence offers a way to appeal to their interests and the relevance of the disease in their lives.

Young women also voiced that they believe visual and statistical evidence within messages will be persuasive towards this age group. Statements about the visual threat of osteoporosis echoes previous research (Klohn & Rogers 1991). Health communication research studying the effectiveness of visual or verbal representations of statistical evidence, however, has found verbal forms to be more persuasive (Parrott, Silk, Dorgan, Condit, & Harris, 2005), and young women did state interest in having real people discuss their experiences with the disease. Research is needed to test these forms of evidence in osteoporosis prevention messages among young women to determine effectiveness.

Limitations and Conclusion

This study begins a program of research to develop more specific awareness efforts for young-adult women about osteoporosis. Although the study was conducted at a large rural university, the student population draws from large urban cities and rural areas. The small sample size and lack of self-efficacy statements may suggest these focus groups are not generalizable to all young women, as previous research has found that construct to be important in osteoporosis prevention and education (Piaseu et al., 2002). In addition, young women did not discuss the relationship between contraception and bone mass development or other concerns with bone density aside from appropriate levels of calcium intake.

Nevertheless, this research does provide an initial understanding of the unique osteoporosis awareness needs and efforts in relation to reaching young women. In particular, focusing on audiences where behaviors can be maintained through their life-time is considered a critical step towards osteoporosis prevention (Surgeon General, 2004). Results from this focus group provide suggestions for achieving this goal.

Notes

1. After the completion of one focus group, a participant revealed to be 33 years of age within the demographic survey, but had previously stated their age to be 30 in the recruitment procedure. Due to the study procedure, it was unclear which participant this may have been in the focus group. After discussion with other researchers, it was deemed appropriate to keep the focus group with one participant three years from the target age group within the analyses.
2. Os-Cal is an oral calcium and vitamin D supplement.

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