

Bone Marrow Donation: Factors Influencing Intentions in African Americans

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Purpose/Objectives: To identify factors influencing the intentions of African Americans to donate or not to donate bone marrow.

Design: Exploratory, descriptive.

Setting: Participants were recruited from three churches, four public housing developments, and a university teaching hospital—all in the Philadelphia, PA, area.

Sample: African American adults aged 18–60 years and able to read, write, and speak English.

Methods: Focus groups were conducted for the purpose of instrument development. A factor analysis was conducted on questionnaire data. A multiple regression was conducted of the demographic variables and the factors that contributed to behavioral intention to donate or not to donate bone marrow.

Main Research Variables: Attitudes, subjective norms, perceived behavioral control, and behavioral intentions regarding bone marrow donation.

Findings: “Fear or not trusting,” “external influences,” and “concerned about resources” correlated significantly with the intention not to donate bone marrow. Helping others, approval of people, and value of knowledge correlated significantly with the intention to donate bone marrow.

Conclusions: Greater attention must be paid to increasing donations and improving the critical need for bone marrow donors. Patient education programs should be expanded to improve African Americans’ knowledge of the importance of bone marrow donation, including the process, associated costs, and resources available to donors.

Implications for Nursing: Nurses—irrespective of practice areas—are key contributors to increase the rate of bone marrow donation, particularly among African Americans.

Key Points . . .

- ▶ If racial disparity in the current healthcare environment in the United States is a reason for lower donation and transplantation rates for African Americans, interventions should be designed to address issues of equity and trust in the U.S. healthcare system.
- ▶ Greater steps must be taken to increase bone marrow donor availability among African Americans. Given that education of patients and the lay community is integral to the role of nurses in hospitals, communities, and other settings, nurses are in an ideal position to impress upon African Americans the critical need for bone marrow donation and, while doing so, to encourage African Americans to become donors.
- ▶ To test new strategies to recruit African American donors, vigorous descriptive research on bone marrow donation in this population is a prerequisite for gaining knowledge of the intentions of African Americans regarding bone marrow donation, as well as an understanding of the barriers preventing African Americans from donating bone marrow.
- ▶ Patient education programs should be expanded to (a) provide explicit information regarding the matching process and the likelihood for African Americans to match other African Americans, (b) gather personal information about donor recipients so that potential donors can relate to the human side of donation, and (c) explain specific information about medical coverage, donor expenses, and resource issues.

A major obstacle confronting patients, nurses, other healthcare practitioners, and researchers involved with bone marrow transplantation is insufficient availability of bone marrow donors. The scarcity of donor availability is woefully problematic in the African American population, whose representation in the National Marrow Donor Program (NMDP) is disproportionately low as compared to Caucasian representation (Laver et al., 2001). African Americans constituted 388,847 (8%) of prospective donors in the NMDP and only 645 (4%) of transplant recipients (NMDP, 1999).

The race and ethnicity of bone marrow donors play a significant role in determining the probability of matching and, consequently, of survival (Confer, 2001; Mori, Graves, Milford, & Beatty, 1996; Yancey, Coppo, & Kawanishi, 1997). According to Laver et al. (2001), Caucasian patients with leukemia, lymphoma, or other disorders treatable with transplantation have about an 80% chance of finding unrelated bone marrow donors by searching the NMDP registry. In contrast, African American

patients find matches less than 30% of the time. Moreover, because some phenotypes are common among certain racial groups, human lymphocytic antigen (HLA) matching has become even more problematic with the increase of individuals with racial as well as mixed racial identities (Mori et al.).

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Therefore, greater steps must be taken to increase bone marrow donor availability among African Americans. Given that education of patients and the lay community is integral to the role of nurses in hospitals, communities, and other settings, nurses are in an ideal position to impress upon African Americans the critical need for bone marrow donation and, while doing so, to encourage African Americans to become donors.

For several years, the NMDP has been able to locate HLA matches for about 30% of all patients in search of bone marrow (Ballen et al., 2002; Laver et al., 2001; NMDP, 1999). Beatty and Anasetti (1990) asserted that more donors are needed to address the needs of the 60%–70% of potential marrow recipients who do not have matched siblings. Because African Americans have so few registered donors and their chances of finding matched unrelated donors are severely limited, considerable attention has been focused on recruiting African American donors, along with other minority donors, for the national registry (Beatty & Anasetti). However, current vigorous marketing and recruiting do not address the deeper issue of why African Americans have not been donating bone marrow. As the African American population continues to grow and the United States becomes more racially mixed, the intentions of African Americans regarding bone marrow donation need to be explored so that those directly involved with increasing the pool of bone marrow donors can gain an understanding of the reasons for the paucity of African American bone marrow donations. Hopefully, such an understanding will result in an increase in African American donors in the NMDP.

As a result, this exploratory, descriptive study, which is theoretically grounded in Ajzen's (1991) Theory of Planned Behavior (TPB), sought to identify specific factors influencing African Americans' intentions regarding bone marrow donation and the effects of demographic variables on these intentions. Ajzen's theory proposes that an individual's behavior is determined by an intention to perform the behavior. The intention is shaped by "attitudes," "subjective norms," and "perceived behavioral control." Attitudes are reflected in an individual's positive or negative evaluation of the outcome of the behavior. Subjective norms reflect the existence and degree of social pressure that the individual may anticipate in performing or not performing the behavior. Perceived behavioral control indicates the discernible ease of or difficulty with performing the behavior and includes such factors as opportunities and resources available to the individual.

Literature Review

The current limitation of bone marrow transplantation results from the dearth of suitable HLA-matched donors and complications associated with HLA disparities. In the absence of a suitable HLA identical sibling donor or a matched unrelated donor, mismatched donors often are used. However, an increased risk of morbidity and mortality exists with the alternative, despite current clinical trials to improve the success of mismatched transplants (Gluckman, 2000). Until bone marrow transplantation with mismatched donors is perfected, nurses must continue their efforts to increase the pool of available donors, particularly the pool representing African Americans.

Although Caucasians in the United States can match Caucasians in European registries, matching problems are compounded for African Americans because of greater

genetic distance from Caucasians and a lack of foreign donor sources. Further complicating the acquisition of donors in the African American population is the strong likelihood that constructing a bone marrow registry is viewed as a low priority in some African and Caribbean nations plagued with devastating health issues, such as malnutrition and AIDS. Moreover, little opportunity for reciprocity exists in African and Caribbean nations where, as a result of inadequate access to transplantation, motivation is lacking for an unrelated bone marrow registry. As a consequence, attempts on the part of the United States to ask such nations to participate in matching endeavors could be interpreted as unethical and exploitative (Yancey et al., 1997).

Barriers to tissue-donor recruitment also exist in the United States, where difficulty arises in eliminating the barriers specific to bone marrow donations from African Americans and barriers related, perhaps, to the past and current treatment of African Americans by the healthcare system in the United States. To understand an African American's reluctance to donate bone marrow, one needs only look to African Americans' internalization of the experience of the medical subjects in the Tuskegee Syphilis Study (Loue, 1999). As a consequence, low bone marrow donation rates among African Americans may be reflective, to an extent, of a deep distrust of the medical system in the United States. Furthermore, racial disparity in the current healthcare environment may be a contributing barrier to bone marrow donation and access to health care in general.

Harris, Andrews, and Elixhauser (1997) demonstrated that hospitalized African Americans were 48% less likely than Caucasians to receive therapeutic procedures, controlling for factors such as insurance status, severity of illness, and age. The data support the hypothesis that differential provision and acquisition of health care is related to race. If racial disparity in the current healthcare environment in the United States is a reason for lower donation and transplantation rates for African Americans, interventions should be designed to address issues of equity and trust in the U.S. healthcare system (Sekeres et al., 2004; Siminoff & Arnold, 1999).

Methods

An exploratory, descriptive design was used to explore African Americans' responses concerning their intentions to donate bone marrow and the factors influencing their intentions. The researchers defined bone marrow donation as the willingness to agree to be HLA typed and to donate marrow cells collected via apheresis or bone marrow harvest once a nonrelative recipient had been identified as a matching donor. In phase I, a list of broad categories pertaining to intentions to donate or not to donate bone marrow was generated, and methods of qualitative inquiry were used initially. In phase II, quantitative methods of analysis were used to identify factors that correlated with intentions to donate or not to donate bone marrow. Two different groups of participants were required for each phase of the study. A nonprobability sampling technique was used to select participants for both phases.

Sampling in phase I was aimed at recruiting subjects for focus group interviews designed to generate a broad list of categories pertaining to the participants' intentions to donate or not to donate bone marrow. Sampling in phase II was aimed at recruiting a larger group of subjects to complete an instrument designed from phase I data, which was subjected

to factor analysis. Participants eligible for inclusion in both phases of this study were African Americans born in the United States, black immigrants or naturalized black citizens who had been in the United States for five or more years, and biracial Americans (who had one parent not considered black or African American). The participants had to be 18–60 years old and able to read, write, and speak English. Required also was that participants had never donated bone marrow. In addition, black immigrant or biracial participants, regardless of whether they considered themselves to be African Americans, were asked to identify their subpopulations, namely, African, Virgin Islander, Haitian, Jamaican, West Indian Islander, LatiNegro, black/Native American, black/Asian American, or black/Caucasian.

The participants were accessed in the Philadelphia, PA, area from three churches, an urban hospital, and four public housing developments. The selected sites reflected a range of African American socioeconomic backgrounds, particularly middle and lower socioeconomic groups derived from national socioeconomic demographics based on income.

Informed Consent

Prior to initiation of the study, permission to conduct the study was requested from Drexel University's and Duquesne University's institutional review boards. Permission was sought to approach African Americans at their churches from the respective pastors and church members; permission to approach participants from the four public housing developments associated with the nursing center was sought from an associate dean of community programs. Although participation in the study was voluntary, informed written consent was requested of all participants. The participants were instructed that they could refuse to answer any questions and could withdraw from the study at any time. Moreover, the participants were told that the sources of any information obtained as a result of the study would remain anonymous. Data collected were coded by numbers rather than by names, and a master list of the participants by codes and names was maintained to avoid use of the same participants twice.

Phase I: Focus Group Interviews

Each participant completed a **demographic data form**. The form was developed by the researchers, who based it on the recommendations of Villarruel (1995), Switzer, Dew, Butterworth, Simmons, and Schimmel (1997), and the NMDP (1999). Demographic variables consisted of age, gender, educational level, annual family income, religious affiliation, attendance at church services and activities, racial subculture, country of origin, current health problems that would affect ability to donate bone marrow, possession of an organ donor card, and place and status of employment.

Phase I involved the development and use of the **Interview Guide for Focus Groups (IGFG)** (see Figure 1). The questions posed for the interviews were conceptually designed by the researchers using the Ajzen's (1991) TPB.

Three focus groups were conducted with 8–12 individuals in each group for the purpose of instrument development. The focus group interviews were the primary method for collecting qualitative data. Each interview was conducted in the presence of an African American nurse knowledgeable in African American culture and norms and thus serving as a cultural adviser whose function was to identify and clarify

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1. Have you ever heard of bone marrow donation?
 2. When you think about bone marrow donation, what comes to mind?
 3. What do you believe are the advantages of donating bone marrow?
 4. What do you believe are the disadvantages of donating bone marrow?
 5. Is there anything else you associate with donating bone marrow?
 6. Are there any groups of people who would approve of your donating bone marrow?
 7. Are there any groups of people who would disapprove of you donating bone marrow?
 8. Are there any groups of people who come to mind when you think about donating bone marrow?
 9. What factors might motivate you to donate bone marrow?
 10. What factors might stop you from donating bone marrow?
 11. Would the person receiving your bone marrow affect your intention to donate (e.g., family member, close friend, church member, stranger)?
 12. Have you ever thought of donating bone marrow?
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Figure 1. Interview Guide for the Focus Groups

cultural meanings that might emerge in the discussions. Each interview included a psychiatric/mental health nurse practitioner in case any participants became disturbed while other participants spoke about bone marrow donation. Moreover, a psychiatric/mental health clinical nurse was on call in case any participant experienced distress after completion of the focus group discussions. All interviews were tape recorded with the permission of the participants. The length of each focus group was approximately 90–120 minutes.

After content analysis, frequencies were tabulated to document the number of responses under each theme. The frequencies established prevalence of themes among total respondents (Ajzen & Fishbein, 1980).

Phase II: Development of a Tool, Administration, and Analysis

Phase II involved the development of an instrument named the **Bone Marrow Donation Intention Tool (BMDIT)**. The tool was based on the qualitative data obtained from the focus group interviews. A Likert-type scale was developed based on Ajzen and Fishbein's (1980) construction of a sample questionnaire. The following eight broad categories were established from the 10 salient beliefs of the focus group participants: "fear of pain," "disadvantage of donating," "helping another," "status of recipient," "external influences affecting intention to donate," "cultural issues," "general issues," "taking care of self," "education," and "matters who is the recipient." Approximately eight questions were written for each broad category. Twenty-three questions related to attitude, 12 to subjective norms, 16 to perceived behavioral control, and 13 to intention. Also included was a question pertaining to the best way to convey information to African Americans about the need for bone marrow donations. Content validity and cultural appropriateness of the instrument were assessed by individuals qualified in those areas. Additionally, a researcher familiar with the TPB reviewed the instrument for congruence with the theory. A major strength of the measurement approach taken by Ajzen and Fishbein was the grounding of the instrument-development process in the qualitative findings from members of the study population. The practice enhanced content validity and ensured that the items were relevant for the study population and the target behavior (Young, Lierman, Powell-Cope, Kasprzyk, & Benoliel, 1991).

Reliability coefficients based on Cronbach's alpha for each subscale of the instrument were calculated to determine internal consistency of the items. Cronbach's alpha was 0.83 for attitude, 0.80 for subjective norms, 0.78 for perceived behavioral control, and 0.63 for intention. Although the acceptable standard for reliability coefficients (Cronbach's alpha) usually is 0.70, values lower than 0.70 have been deemed acceptable with research that is exploratory in nature (Hair, Anderson, Tatham, & Black, 1995). According to the SMOG Readability Formula, the BMDIT is at the eighth-grade reading level (McLaughlin, 1969). That reading level was considered appropriate for subjects in the study because 85% of the participants had completed a high school education. Sample questions can be found in Figure 2.

1. If I donate my bone marrow, I may get an infection. (–3 = extremely unlikely to 3 = extremely likely)	–3	–2	–1	0	+1	+2	+3
2. In general, how much do you want to do what your partner (husband, wife, boyfriend, or girlfriend) thinks you should do? (–3 = not at all to 3 = very much)	–3	–2	–1	0	+1	+2	+3
3. I would not want to give my bone marrow to a very old person. (–3 = strongly disagree to 3 = strongly agree)	–3	–2	–1	0	+1	+2	+3
4. My partner's (husband's, wife's, boyfriend's, or girlfriend's) opinion about whether I should donate bone marrow is important to me. (–3 = not at all to 3 = very much)	–3	–2	–1	0	+1	+2	+3
5. Knowing more about bone marrow donation might encourage me to donate my bone marrow. (–3 = strongly disagree to 3 = strongly agree)	–3	–2	–1	0	+1	+2	+3
6. To me, saving someone's life by donating my bone marrow is extremely bad (–3) to extremely good (3).	–3	–2	–1	0	+1	+2	+3
7. Knowing about bone marrow donation may encourage African Americans to donate bone marrow. (–3 = strongly disagree to 3 = strongly agree)	–3	–2	–1	0	+1	+2	+3
8. My family would approve of me donating my bone marrow. (–3 = not at all to 3 = very much)	–3	–2	–1	0	+1	+2	+3
9. If I donate my bone marrow, I may get infected with HIV. (–3 = extremely unlikely to 3 = extremely likely)	–3	–2	–1	0	+1	+2	+3
10. My fellow church members' opinions about whether I should donate bone marrow are important to me. (–3 = not at all to 3 = very much)	–3	–2	–1	0	+1	+2	+3
11. The concerns of taking care of my children in the next 12 months would make it difficult for me to donate bone marrow. (–3 = strongly disagree to 3 = strongly agree)	–3	–2	–1	0	+1	+2	+3

Figure 2. Sample Questions From the Bone Marrow Donation Intention Tool

Factor Analyses

Factor analyses were conducted on the themes derived from the qualitative data to identify factors that encouraged and discouraged African American bone marrow donation. A factor analysis examined interrelationships among variables and extricated the relationships to identify the most closely linked clusters of variables. A regression analysis was used to answer questions pertaining to demographic variables and intentions to donate bone marrow.

Results

Sample

A final sample of 224 participants was recruited for phase II of the research study. Of the 224 participants who completed the questionnaire, four subjects were removed from the data set because of incomplete questionnaires. The mean age range of the participants was 32.9 years (SD = 12.7). Sixty-nine percent of the participants (n = 153) were female, and 31% (n = 67) were male. In terms of education, 41% of the participants (n = 91) were high school graduates, and 31% (n = 69) had some high school education. Forty-seven percent of the participants (n = 104) had an income less than \$20,000. Most of the participants (52%, n = 115) were Baptists.

Content Analysis of Focus Group Interviews

The participants identified a list of 10 salient beliefs. “Painful experience for the donor,” “health concerns for the donor,” and “family’s approval” were ranked as one, two, and three, respectively, by the focus group participants as salient beliefs influencing bone marrow donation (see Table 1).

Factor Analysis From the Bone Marrow Donation Intention Tool

The 65-item BMDIT was designed to identify factors influencing African Americans’ intentions regarding bone marrow donation. Item 65 was a multiple-choice item intended to discover what the participants considered the best way to obtain information about bone marrow donation. The negative items from the BMDIT were entered into an exploratory factor analysis using principal components extraction and oblique rotation. The number of factors generated with eigenvalues greater than 1.00, as well as theoretical considerations, determined the factor solution. Seven factors were identified: “fear or not trusting,” “helping others,” “external influences,” “approval of people,” “care that individual is a human being,” “value of knowledge,” and “concern about resources.” Loading criteria for factor inclusions were set at 0.60. However, an exception was made in factor four for the item “friends approve,” which loaded 0.59, because the factor was conceptually appropriate. An exception also was made for factor seven for two items—“Who pays my medical coverage worries me” and “Who will pay my expenses worries me”—which loaded 0.51 and 0.57, respectively, for conceptual reasons. Tables 2 and 3 present a summary of the results of the factor analysis of the reasons influencing African Americans’ intentions regarding bone marrow donation. The factors illustrated in Table 3 represented three independent variables—attitude, subjective norms, and perceived behavioral control—because the factors related to bone marrow donation.

Table 1. Identification of Salient Beliefs Influencing Bone Marrow Donation

Rank	Belief	%
1	Painful experience for the donor	41
2	Health concerns for the donor	38
3	Family's approval	26
4	Fear of getting an infection, HIV, or hepatitis from donating	23
5	Saving someone's life	23
6	Helping another person	23
7	Helping someone with cancer	18
8	Helping children	18
9	Concern about who will pay donor expenses	18
10	Need to have affairs in order	18

N = 34

“Fear or not trusting” was correlated with intention not to donate, whereas “helping others” was correlated with intention to donate ($p < 0.0001$). “Fear or not trusting” contributed to 32% of the variance in intention, whereas “helping others” contributed to 21% of the variance in intention. “External influences” significantly correlated with intention to donate ($p = 0.0021$). “Approval of people” positively correlated with intention to donate ($p = 0.0123$). “External influences” contributed to 19% of the variance in intention, whereas “approval of people” contributed to 34% of the variance in intention. “Value of knowledge” and “concern about resources”—both perceived behavioral control constructs—correlated significantly with intention to donate or not to donate ($p = 0.0008$ and 0.0006 , respectively).

Additional Analyses

Further analyses were conducted on the religions and income of the study participants for the purpose of investigating whether religion exclusively or a combination of religion and income predicted intentions to donate bone marrow. The means for intention to donate adjusted for religious affiliation and income were as follows: Catholic, 0.47; Baptist, 0.66; Methodist, 1.44; and people who did not attend church, 0.87. Affiliation with the Methodist church also correlated significantly with intention to donate bone marrow ($p = 0.0022$). A post-hoc *t* test for church and income was conducted. When income was controlled, significant differences occurred between Methodist and Catholic affiliations ($p = 0.0153$) and Methodist and Baptist affiliations ($p = 0.0013$). Individuals affiliated with the Methodist church differed in intention from individuals from other denominations and leaned more toward intending to donate bone marrow, thus indicating that religion was an important indicator for intention to donate bone marrow.

Findings revealed that “fear or not trusting,” “external influences,” and “concern about resources” were associated with each subject’s intention not to donate bone marrow. “Helping others,” “approval of people,” and “value of knowledge” were associated with intention to donate bone marrow. Demographic variables that significantly correlated with intention to donate were possession of an organ donor card and affiliation with the Methodist church ($p = 0.0010$ and 0.0022 , respectively). An income of \$20,000–\$29,999, as well as divorced marital status, also correlated significantly with intention to donate ($p = 0.0169$ and 0.0336 , respectively).

Discussion

Intentions to Donate Bone Marrow

A theme that arose among the focus group participants was that the backgrounds of the recipients of bone marrow mattered to some extent. Responses varied as to whether the participants would donate bone marrow to strangers or limit bone marrow donations only to close friends or family members. The members of the focus group at the community center of the public housing development were especially concerned about the characters of the recipients. They indicated that they would donate bone marrow only to stable individuals, namely, those who did not abuse drugs, whereas participants in the focus groups at the hospital and churches were favorably disposed toward donating bone marrow to all those in need of donations.

The fact that some of the participants would donate their bone marrow exclusively to people who did not abuse drugs has not been cited in the literature. This unexpected finding suggests that the focus group participants at the public housing development viewed individuals who were using illicit drugs on a regular basis as unconcerned about personal health and overall well-being and, thus, did not merit or would not appreciate the sacrifices made by bone marrow donors.

In the same vein, the age of recipients also was a concern for a few participants. The participants from the hospital were opposed to experiencing the pain or discomfort of donating bone marrow for people 80–90 years old but would be willing to do so for children. Presumably, the participants viewed people 80–90 years old as nearing the end of life and, therefore, being in far lesser need of bone marrow transplants than younger people.

Most of the focus group participants requested more information about donor recipients—including age, occupation, marital status, and number of children—before they would consider donating bone marrow. The finding is supported by those who identified empathy for bone marrow recipients as a significant factor influencing bone marrow donation (Switzer et al., 1997, 2003). Indeed, detailed personal information about recipients is central in assisting potential donors in connecting with the human side of the recipients and, as a result, increasing the donors’ ability to empathize with the recipients.

Personal Attitudes

With respect to personal attitudes, the focus group participants expressed concerns about the pain involved in donating bone marrow. In addition, the thoughts of cancer and children automatically came to mind when the participants heard the term “bone marrow transplant.” Getting or giving an infection and contracting diseases, such as HIV and hepatitis, also were issues, as was general concern for the health of the donors. The concerns about pain and health matters were consistent with research conducted by Beatty, Atcher, Hess, Meyer, and Slichter (1989) and purported that pain and fear of physical harm were reasons for reluctance or refusal among most African Americans to donate bone marrow. Another consideration of the focus group participants was the possibility that transplants might not prove successful after donors underwent the pain and inconvenience of donation. This finding reflected that of Switzer et al. (1997), whose research indicated that donor ambivalence was associated with attrition from the national

Table 2. Factor Loadings From Factor Analysis

Factor	Factor Loading
Fear or not trusting	
Getting hepatitis worries me.	0.72076
Important people get bone marrow donations first.	0.59683
My own health may suffer.	0.67947
White people receiving bone marrow before African Americans worries me.	0.60596
Contracting HIV worries me.	0.64921
Getting an infection worries me.	0.63494
Helping others	
Saving someone's life	0.63087
Helping another person is good.	0.75118
Donating bone marrow is good.	0.76364
External influences	
Church's opinion is important.	0.60212
Do what church members think	0.69941
Do what friends think	0.69798
Do what family thinks	0.68931
Friends' opinions are important.	0.62528
Approval of people	
Family approves.	0.65665
Partner approves.	0.69254
Friends approve.	0.59326
Care that individual is a human being	
Would give to a stranger	0.61411
Would give to whoever needs it	0.65440
Would give only to a close friend or family member	-0.59820
Value of knowledge	
Knowing about bone marrow encourages donation.	0.63332
Knowing about patient encourages donation.	0.60308
If I knew more, I would donate.	0.71740
Someone caring for my family is encouraging.	0.67622
African Americans are more likely to donate if they know about bone marrow donation.	0.63284
Concern about resources	
Children make donating difficult.	0.60235
Who pays my medical coverage worries me.	0.50946
Who will pay my expenses worries me.	0.57388

registry, together with anxiety about physical difficulty and negative feelings following donation. The correlation of donor anxiety concerning outcomes of bone marrow transplantation and the health of donors after donation warrants further investigation.

Helping another person or saving someone's life was highly regarded by many of the focus group participants and emerged as a common theme during the group discussions. Also noted was that the participants expressed concerns that the status or race of recipients would affect the bone marrow allocation process. The participants' feelings that Caucasians and prominent African Americans would receive bone marrow transplants before less prominent African Americans negatively affected the participants' intentions to donate. Yancey et al. (1997) pointed out the same perception as a chief factor contributing to the reluctance of African Americans to become bone marrow donors. According to Dedier, Penson, Williams, and Lynch (2002), alarming disparities exist between the health outcomes of minority and nonminority populations. Racial and ethnic biases among

healthcare professionals contribute to the pervasive problem of racial disparity and need to be addressed so that equitable health care is available for all. Addressing this problem should begin with an understanding of patients' cultural frameworks, personal awareness, education, and accountability.

Subjective Norms

The participants differed on whether their partners, families, friends, or churches would approve of the participants' donating bone marrow. A majority of African Americans in the study were affiliated with the Baptist and Methodist denominations, which, according to Locke (1992), permit bone marrow donation. The participants articulated that they seldom heard of African Americans receiving bone marrow transplants and perceived that transplantation, based on what they heard in the media, was prevalent among Caucasian individuals.

Mitchell, Meehan, Kong, and Schulman (1997) also found that substantial variations existed regarding access to bone marrow transplantation for African Americans as compared to Caucasians. In addition, the focus group participants expressed that African Americans were more private about their bodies and, as a group, did not believe in donating their organs, thus supporting Perez et al. (1988), who suggested that African Americans were less willing than other races to donate the organs of deceased family members.

Perceived Behavioral Control

A general concern arose among the focus group participants regarding payment for expenses related to medical coverage and compensation for days lost from work for donating bone marrow. Care of family members, especially children, while they donated marrow also was a major consideration. Laver et al. (2001) cited the same concerns as factors preventing African Americans from donating bone marrow, but Daniels, Rene, and Daniels (1994) claimed that monetary compensation was not a factor deterring African Americans from donating bone marrow. Although further research needs to be conducted to determine whether financial support will, in part, induce African Americans to donate bone marrow, the focus group participants agreed that education regarding the importance of bone marrow donations in saving lives and the process itself would encourage African Americans to donate. Yancey et al. (1997) also cited the need for culturally appropriate educational strategies to solicit ethnic minorities to donate bone marrow.

Factors Associated With Intentions to Donate Bone Marrow

The participants viewed helping other people by saving their lives as altruistic and, therefore, clearly a positive outcome of bone marrow donation. The finding is supported by Simmons, Schimmel, and Butterworth (1993), whose research supported the concept of altruism stemming from a strong emphasis on helping others, albeit primarily those in a donor's family of origin. "Helping others" also was a common motive for donating bone marrow according to Switzer et al. (1997). However, the participants in that study had some college education and possessed organ donor cards. Beatty et al. (1989) found a strong correlation between volunteerism and bone marrow donors.

Findings from the current study indicate that knowing personal details about recipients would encourage African Americans to donate bone marrow. For example, the partici-

Table 3. Factor Analysis and Components of Theory of Planned Behavior in Bone Marrow Donation Intention Tool

Factor	Component
Fear or not trusting	Attitude
Helping others	Attitude
External influences	Subjective norms
Approval of people	Subjective norms
Value of knowledge	Perceived behavioral control
Concern about resources	Perceived behavioral control
Care that individual is a human being	Intention

pants would be more willing to donate bone marrow to people responsible for others (for example, a 28-year-old married mother of three young children and the holder of a part-time job as an administrative assistant).

Third, the factor “approval of people” also correlated with the intention to donate in view of the approval of a potential donor’s partner, family, and friends, thus indicating that social support of a behavior encouraged the particular behavior—a point raised by Switzer et al. (1997). Conversely, individuals who were discouraged by their partners, friends, and families from donating had higher attrition rates and increased postdonation psychological difficulties (Switzer et al., 1997).

The participants would donate bone marrow to strangers or whoever needed it rather than exclusively to close friends or family members. Switzer et al. (1997) reported that the simple desire to help others was a factor important to unrelated donors in their decision to donate bone marrow.

Factors Associated With Intentions Not to Donate Bone Marrow

The factor “fear or not trusting” significantly correlated with the intention not to donate. Specific fears included getting an infection or disease and distrust of the medical system in the United States. Gutoski (1995) also cited distrust of the U.S. medical system and racism as factors that influenced African American participants’ decisions not to donate bone marrow. Having more education and working in a hospital setting appear to decrease fear of donating. The findings are supported by Prottas and Batten (1991), whose research showed that those with higher incomes and educational levels were more inclined to donate bone marrow, as were healthcare workers. However, McNamara et al. (1999) found that African Americans employed in healthcare professions were 60% less likely to donate bone marrow than African Americans not employed in healthcare professions. Because healthcare workers are major conduits of information about bone marrow donation in their communities, attitudes regarding healthcare workers and bone marrow donation should be pursued further.

The participants in the current study were concerned about the opinions of fellow church members and friends and acknowledged the importance of doing what their families, friends, and church members considered appropriate. This concern was in keeping with the findings of Bloom, Hayes, Sanders, and Flatt (1987), who suggested that the influence of others had an impact on African Americans’ decisions regarding bone marrow donation.

African Americans who held college or graduate degrees and those who did not attend church were not as affected by

“external influences.” One explanation for the finding may be derived from Ahijevych and Bernhard’s (1994) view that the locus of control of individuals, such as these, was internal rather than external.

Concerns about who would pay for expenses, namely, medical coverage and parent or child care, loomed large. In fact, Laver et al. (2001) reported that the cost of donation was a significant reason for African Americans’ refusal to donate bone marrow. However, in the current study, participant possession of a college or graduate degree was significantly negatively correlated with concern about resources, whereas marriage was significantly positively correlated to that concern.

Manninen and Evans (1985) and Prottas and Batten (1991) reported that the more highly educated the individual, the more that individual was willing to donate organs. Moreover, upon ascertaining that those with higher incomes were more likely to donate organs, Manninen and Evans associated level of income with willingness to donate. Therefore, because the influence of socioeconomic factors on attitudes toward organ donation cannot be underestimated, the same is likely to be the case for bone marrow donation.

Demographic Variables Associated With Intentions to Donate Bone Marrow

This study showed a significant positive correlation between possession of an organ donor cards with intention to donate bone marrow. Individuals who already had agreed to donate their organs upon death likely valued altruism and likely would be willing to donate regenerating tissues while alive.

The participants affiliated with the Methodist church also were more likely to donate. This finding, which has not been reported in the literature, is thought provoking and warrants further attention.

In addition, a positive correlation occurred between intention to donate and household income of \$20,000–\$30,000 per year. Higher income has been associated with more willingness to donate organs (Manninen & Evans, 1985; Prottas & Batten, 1991). However, such was not the case in the current study: Higher income did not correlate with intention to donate bone marrow.

The current study also showed a positive correlation between divorce and intention to donate bone marrow, which differs from the research of Switzer et al. (1997), who reported that 65% of 343 bone marrow donors were married. The unexpected finding regarding divorced African Americans and intentions to donate bone marrow may stem from empathy in that those who have experienced the pain of divorce are sensitive to the pain of others and are, therefore, more inclined to help those who are ill and suffering. The finding differs from research in which bone marrow donors, based on the majority population, were married.

Demographic Variables Associated With Intentions Not to Donate Bone Marrow

No significant correlations occurred between intentions not to donate bone marrow and the demographic variables listed on the demographic data form. The participants least likely to donate bone marrow were those who did not possess organ donor cards as opposed to those who did; those affiliated with the Baptist and Catholic denominations, together with those who did not attend church, as opposed to those affiliated with

the Methodist church; those whose incomes were less than \$20,000 per year; and those who were married, as opposed to those who were divorced. However, none of the correlations was significant.

Study Limitations

The interpretations of the study findings are limited by the nature of the sample. Approximately 47% (n = 104) of the participants were from a predominately urban area and reported a household income of less than \$20,000 per year. The demographics of the participants limited the degree to which the findings can be generalized. In the future, researchers should recruit African Americans from higher socioeconomic backgrounds in terms of neighborhoods, education, religious beliefs, and memberships in regional and national organizations because African Americans of middle and higher socioeconomic backgrounds may have different beliefs and intentions regarding bone marrow donation as compared to those in the current sample.

Because 52% (n = 115) of the participants were affiliated with the Baptist church and 19% (n = 41) were affiliated with the Methodist church, the degree to which the findings can generalize to all African Americans is limited (Locke, 1992). Perhaps some of the cultural aspects and meanings salient to African Americans in reference to bone marrow donation could be strengthened by the use of specific questions related to culture or the use of a cultural conceptual framework in addition to the TPB. Finally, studies related to African Americans' intentions to donate cord blood stem cells should be conducted in the future (Fernandez, Gordon, Van den Hof, Taweel, & Baylis, 2003), because cord blood stem cells could serve as an important marrow source.

Despite the aforementioned limitations, results from the study and further research concerning bone marrow donation in African Americans can be useful for nurses dealing with the pressing need to increase bone marrow donations by recruiting more donors.

Recommendations

Although replication studies rarely are pursued in nursing (Zachariah, 1995), this explorative, descriptive study should be replicated with a larger and more diverse sample of African Americans across the United States, particularly those from middle and higher socioeconomic groups living in suburban areas and holding college or graduate degrees and a wider span of religious beliefs. The study should be replicated with a revised version of the BMDIT following data reduction as a result of the factor analysis. A model addressing cultural norms, for example, needs to be considered in future studies. Intervention studies should be conducted with particular attention to the results of the study.

According to Ontilio et al. (2004), because the match rate of same-race individuals is higher than that of mixed ethnic and racial groups, recruitment drives regarding minority groups in recent times have become more intense. Nevertheless, recruitment efforts should include educational outreach programs that (a) provide further explicit information regarding the HLA matching process and the greater likelihood of African Americans matching with other African Americans, (b) gather personal information about and accounts from donor recipients so that potential donors can relate to the human side of recipients, and (c) explain specific information about medical coverage, donor expenses, and resource issues.

Although efforts have been made to increase awareness of the need for African American bone marrow donors, the problem of low representation in the NMDP still exists and needs to be addressed even more aggressively. Because nurses usually spend the most time with patients and their families in the hospital and community and frequently are the healthcare professionals to whom patients and families turn for information and support about health decisions, nurses should design culturally appropriate educational programs related to bone marrow donation and transplantation. As such, nurses will be better equipped to inform the African American community more effectively about the increasingly critical need for donations. In fact, the Institute of Medicine (2002) emphasized that cross-cultural curricula should be integrated early in the education of future nurses and other healthcare providers and that practical and vigorously evaluated educational programs should persist through clinical practice.

Conclusion

Nurses in the United States, irrespective of practice areas, are key contributors to increasing the current rate of bone marrow donation, especially with respect to African Americans, among whom the rate remains alarmingly low. However, before making more vigorous and more concerted efforts to raise awareness of the vital importance of bone marrow transplantation among the African American population, nurses must be mindful of African Americans' intentions regarding bone marrow donations. In doing so, nurses will be better equipped to break down current barriers preventing African Americans from enlarging the bone marrow pool. If successful, nurses will be instrumental in motivating African Americans to become major contributors in improving and safeguarding the health of families, friends, and other African Americans.

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