Disparities in knowledge and willingness to donate research biospecimens: a mixed-methods study in an underserved urban community

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Received: 5 November 2013 / Accepted: 8 April 2014 / Published online: 26 April 2014
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Abstract Although research involving biospecimens is essential in advancing cancer research, minorities, especially African-Americans, are underrepresented in such research. We conducted a mixed-method (qualitative focus groups among African-Americans and quantitative cross-sectional surveys) study on factors associated with biospecimen knowledge and donation intent in the medically underserved urban communities in Southeast and Southwest Washington, DC. Focus groups were conducted among 41 African-Americans and survey data was available from 302 community residents of different races/ethnicities using convenience sampling. We used logistic regression to model the association between biospecimen knowledge and donation intent with selected sociodemographic variables using survey data. Only 47 % of the participants had knowledge of the different types of biospecimens. In multivariate logistic regression models, male gender, African-American race, and low education levels were significantly associated with lower knowledge about biospecimens. Compared to Whites (79 %), fewer African-Americans (39 %) and Hispanics (57 %) had knowledge of biospecimens but the difference was significant for African-Americans only. Positive intent to donate biospecimens for research was observed among 36 % of the survey respondents. After multivariate adjustment, only biospecimen knowledge was associated with donation intent (odds ratio = 1.91, 95 %

confidence interval 1.12, 3.27). Contrary to popular opinion, “mistrust of the medical community” was not the most commonly reported barrier for biospecimen donation among African-Americans. “Not knowing how biospecimens will be used” and “lack of knowledge of biospecimens” were the most common barriers. Our study highlights the importance of education on biospecimens among community residents to increase minority participation in biospecimen research.

Keywords Biospecimen · Knowledge · African-American · Disparities

Introduction

The National Cancer Institute (NCI)’s Office of Biorespositories and Biospecimen Research defines biospecimens as a quantity of tissue, blood, urine, or other human-derived material (National Cancer Institute). It is well established that the study of high-quality biospecimens is vital to the advancement of cancer research and to the mission of personalized medicine (Vaught et al. 2011; Hewitt 2011; Waltz 2007; Moore et al. 2009). Moore et al. (2009) suggest that biospecimen research represents the kind of bricks-and-mortar investigation that provides a solid scientific foundation for future advances that will directly help patients.

The participation of African-Americans in biospecimen research is low despite the disparate cancer burden in this population (Luque et al. 2012; Kiviniemi et al. 2013). Results from studies utilizing qualitative data from focus groups suggests that some perceived barriers related to biospecimen donation might be related to lack of information or knowledge on biospecimens/biobanking, fear of collection procedures, and general mistrust of researchers. To

Electronic supplementary material The online version of this article (doi:10.1007/s12687-014-0187-z) contains supplementary material, which is available to authorized users.

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date, however, few studies have reported on prevalence of biospecimen knowledge and donation intent of the general population. In a qualitative study on awareness and interest in biospecimen research among Latinos, Rodriguez et al. reported a low level of awareness but a high level of interest in biospecimen donation with lack of outreach and biospecimen education identified as the major barriers to participation (Rodriguez et al. 2013). Another recent study in a foreign-born Latino population in the USA (Loffredo et al. 2013) noted that 47 % of the Latinos surveyed knew what a biospecimen was and 67 % said that they would provide a biospecimen for research purposes. However, it is not clear what these rates are for other races/ethnicities and whether sociodemographic factors are associated with biospecimen knowledge and donation intent in broader minority and disadvantaged communities.

We used Green's PRECEDE-PROCEED Model (Green and Kreuter 2004) as the theoretical framework to assess sociodemographic factors that might impact biospecimen collection in an urban, primarily minority population in Washington, DC. The model emphasizes a social context and posits that health and health risks are determined by multiple factors, and that efforts to initiate behavioral, environmental, and social change must be multidimensional or multisectoral and participatory (Green and Kreuter 2004). Using a cross-sectional survey, we assessed biospecimen knowledge, awareness, and donation intent among residents in Southeast and Southwest Washington, DC. We hypothesized that sociodemographic factors such as race/ethnicity and education would be associated with knowledge about biospecimens and intent to donate biospecimens for research among survey participants.

Methods

Study design

This study utilized a mixed-method approach, consisting of focus groups on biospecimen research followed by a cross-sectional structured survey among residents in Southeast and Southwest DC. The focus group findings provided insights for the development of the survey instrument and also help to elucidate the survey findings.

The study was funded by the Geographic Management of Cancer Health Disparities Program (GMAP), a systematic and comprehensive approach developed by the National Cancer Institute's Center to Reduce Cancer Health Disparities (CRCHD) with the key goal of advancing cancer health disparities research and training (CRCHD 2013). This study was approved by the Georgetown University Medical Center institutional review board (IRB).

Study population

The eligibility criteria for participation included the following: (1) being able to speak and understand English, (2) being at least 18 years of age, and (3) residing in the southeast and southwest quadrants of Washington, DC, metropolitan area. Recruitment strategies included distribution of recruitment flyers at public venues including churches, community health fairs, and metro stations. The Georgetown-Lombardi Community Advisory Board (CAB), which consists of community residents and representatives of community-based organizations, also provided assistance with targeted recruitment. Four focus groups were conducted ($N=41$ participants) and surveys were administered to 302 community residents. Data from surveys was based on self-report by the participants. There was no overlap between the survey population and the focus group participants.

Data collection instruments

Focus groups Forty-one participants were recruited for four focus groups with 8–12 participants per group. The focus group instrument consisted of a 32-item semi-structured interview guide. The interview guide was developed based on Morgan's (Morgan 1988) funnel strategy design (see [Focus Group Instrument](#), Supplement 1). The focus groups were undertaken till saturation, meaning no new information of value emerged (Morgan 1988). Each group lasted approximately 1 h and 20 min. Two focus group moderators trained in qualitative research facilitated the focus groups and asked questions across the following topics: *medical history, knowledge and perceptions about research, knowledge and perceptions about biospecimens, willingness to donate biospecimens, perceived benefits of biospecimen donation, perceived barriers to biospecimen donation, and preferred message channels for receiving information on biospecimens*. After completing the section on *knowledge and perceptions about biospecimens*, the facilitators gave a brief description of biospecimens and their importance in developing new treatments and making research for new treatments possible. The participants were told that biospecimens were materials from one's person (tissue, blood, saliva, etc.) and are especially important when developing treatments for illnesses that disproportionately affect certain populations.

Survey In keeping with our theoretical model, we designed the "Biospecimen Awareness and Education Survey" based on social factors (i.e., sociodemographics), previous research on biobanking, biospecimens, and clinical trials (Luque et al. 2012; Wallington et al. 2012) and pre-tested it among community members prior to administering it to study participants. Participants who had taken part in the focus groups were not eligible to participate in the surveys. The survey

questionnaire comprised questions on sociodemographic information (age, gender, race, and education status), family history of cancer, knowledge/awareness of biospecimens, intent to donate biospecimens for research, and perceived barriers for biospecimen donation. The possible responses for the questions on knowledge of biospecimens, biospecimen donation intent, and perceived barriers were drawn from the focus group results. Participants were not provided any information or context regarding biospecimens or biospecimen donation for research prior to completing the survey. The survey is presented in Supplement 1.

Outcome measures

Knowledge of biospecimens was assessed by asking participants to select items they thought were biospecimens using a multiple-choice format. The choices were tissue, blood, urine, saliva, oral cells, tumors, all of the above, and none of the above. The survey also had a question on intent to donate biospecimens for research that asked whether participants would consider donating in the future (responses were on a five-point Likert scale—“definitely consider,” “might consider,” “unsure,” “would not consider,” and “definitely would not consider”). Data on knowledge of biospecimens was dichotomized into yes (correctly identified all biospecimens from a multiple choice list) or no (could not correctly identify all biospecimens). The biospecimen donation intent variable was dichotomized to yes (definitely consider donating) and no (might consider/probably not consider/definitely not consider/not sure about donating). In addition, we also collected data on barriers to biospecimen donation with the most common barriers reported by the focus group participants listed as possible responses.

Covariates

The following covariates were measured in the survey: current age, gender, participant race and ethnicity, education status, and family history of cancer.

Data analyses

Focus group

Focus group sessions were digitally taped and transcribed by Shugoll Metro Research Inc. in Bethesda, Maryland. Systematic analysis procedures entailed intensive reading and group discussion of the full transcripts by two coders. The focus group data analysis involved content analysis (Krippendorff 2013). This methodology entails categorizing participant responses to focus group questions based on the focus group interview guide. Each question was converted to a thematic category and all responses given

by participants were considered thematic elements. The preponderance of thematic elements was determined by the relevant theme from each category. The determination of the themes was based on the frequency of responses referencing a given thematic element. Focus group results are reported as the proportion of participant responses in a particular thematic category. Content analysis was performed using NVivo 10, a computerized, qualitative informatics tool (Quantitative Solution in Research-QSR 2009).

Survey

Baseline characteristics of the survey participants were summarized using frequencies and means. Bivariate analyses were conducted using logistic regression to examine unadjusted associations of biospecimen knowledge/awareness and donation intent with selected participants' characteristics. Multivariate logistic regression was used to obtain adjusted estimates for the association of sociodemographic factors with biospecimen knowledge and with biospecimen donation intent in separate models. We decided to include age, race, gender, education status, and family history of cancer in multivariate logistic models investigating biospecimen knowledge and donation intent for face validity. Biospecimen knowledge was a predictor for biospecimen donation intent and was included in the multivariate logistic models for donation intent. All analyses were conducted using SAS v.9.3 (SAS Institute, Cary, NC).

Results

Focus groups

A total of 41 individuals (20 males and 21 females, all African-American) participated in four focus groups. Four major themes emerged: (1) *biospecimen knowledge*, (2) *willingness to donate biospecimens*, (3) *benefits of biospecimen donation*, and (4) *public information about biospecimen collection*.

Biospecimen knowledge Most focus group participants reported they had heard the term, “biospecimen.” Of these, most had heard it at a doctor’s office. A majority of the participants considered tissue or bodily fluids (including blood) to be “biospecimens.” Interestingly, two participants reported that “anything that has some of your DNA” is considered a biospecimen. Many participants agreed that “a biospecimen can be useful in helping diagnose a disease.”

Willingness to donate biospecimens Participants’ attitudes about willingness to donate biospecimens were mixed. While

some indicated they would be willing to donate, other respondents indicated that they would need more information before donating or that they would not donate. When asked under what circumstances they would be willing to donate, respondent attitudes were again mixed. A number of respondents said they would donate if it was to save a life or if they knew how it would be used, while still others indicated, “it depends on the situation.”

Benefits of biospecimen donation When asked whether biospecimen donation would benefit them or their family, many participants agreed that biospecimen donation would directly benefit their families. A few believed that the benefit to them or their families would be indirect because biospecimens would help researchers develop medicines. This theme was repeated when the participants were asked about the importance of biospecimen storage for the future. While most respondents agreed that storage of biospecimens is important, some participants believed it was potentially important for their personal use later in life, as compared to others who believed it was important for clinical research. When asked what would make them uncomfortable about donating, participant responses included uncertainty over its use (i.e., not knowing how the biospecimens would be used), use of needles to obtain specimens, if it was to be used in testing, and if it would be used to save “bad” people. Most of the respondents said that being informed about the purpose and rationale of the biospecimen collection would make them more comfortable with donating.

Barriers to biospecimen donation Aside from awareness, focus group participants cited barriers such as how biospecimens would be used, not being informed about the purpose or rationale of biospecimen collection, and fear and discomfort associated with the actual biospecimen collection process (e.g., fear of needles). The focus group questions on barriers (Supplement 1) were open ended and did not probe for specific barriers.

Public information about biospecimens Many respondents felt that among minorities having the message conveyed by members of the same racial or ethnic group would be useful, and some mentioned celebrity spokespersons. The use of all forms of media, or multiple forms, to relay the message about biospecimen donation to the public was preferred by the focus group participants. A majority indicated that they would want their personal physicians to share biospecimen donation information with them. “The doctors need to explain it in detail.” Some participants also indicated they would like to have brochures about biospecimen donation that could be used to discuss donation with family and friends.

Selected quotes from the focus groups are included in Supplement 2.

Survey

We surveyed a total of 302 participants: African-Americans (73 %), Whites (16 %), and Hispanics (5 %). Although the sampling scheme was convenience-based, the racial/ethnic distribution of the survey participants is reflective of the predominantly African-American areas in Washington, DC, where recruitment was conducted. The study characteristics are presented in Table 1.

Forty-seven percent of the survey respondents had knowledge of biospecimens and correctly identified all items that were biospecimens. Respondents who could not correctly identify all biospecimens were more likely to identify tissue and blood as biospecimens but less likely to report saliva, oral cells, and tumors as biospecimens. Men, African-Americans (compared to Whites), and those with less than high school education level were less likely to be knowledgeable about biospecimens in bivariate analyses (Table 2). Age and family history of cancer were not associated with biospecimen knowledge. In multivariate analyses, gender, race, and education status were significantly associated with biospecimen knowledge. Compared to men, women were 69 % more likely to be knowledgeable about biospecimens (95 % CI, 1.02, 2.81). African-Americans (OR, 0.17; 95 % CI, 0.07, 0.39) and Hispanics (OR, 0.31; 95 % CI, 0.08, 1.14) were less likely than Whites to have biospecimen knowledge. Participants with college education or higher were almost three times as likely to

Table 1 Characteristics of participants responding to the “Biospecimen Awareness and Education Survey” (N=302)

Characteristic	No.	%
Demographics		
Age, mean (SD)	43.0 (16.2)	–
Gender		
Male	159	53
Female	135	45
Not reported	8	2
Race/ethnicity		
African-American/Black	216	72
White (non-Hispanic)	47	15
Hispanic	14	5
Other	17	6
Not reported	8	2
Education		
<High school	58	19
High school or GED	40	13
Some college/university	65	22
College/university	82	27
Post-graduate	57	19
Family history of cancer	133	44

Table 2 Association of biospecimen knowledge with socio-demographic characteristics among survey participants

Characteristic	Knowledge of biospecimens <i>N</i> (%)		Unadjusted odds ratio	95 % confidence intervals	Adjusted odds ratio ^a	95 % confidence intervals
	Yes (47 %)	No (53 %)				
Age, mean years (SD)	43.3 (15.1)	42.7 (16.9)	1.01	0.94, 1.09	1.06	0.98, 1.15
Sex						
Male	69 (43)	90 (57)	Referent	–	Referent	–
Female	72 (53)	49 (47)	1.49	0.94, 2.37	1.69	1.02, 2.81
Race						
White (non-Hispanic)	37 (79)	10 (21)	Referent	–	Referent	–
Hispanic	8 (57)	6 (43)	0.36	0.10, 1.31	0.31	0.08, 1.14
African-American/Black	85 (39)	131 (61)	0.18	0.08, 0.36	0.17	0.07, 0.39
Education						
<High school	14 (24)	44 (76)	Referent	–	Referent	–
High school and some college	48 (46)	57 (54)	2.65	1.32, 5.54	2.40	1.16, 5.18
College graduate or higher	81 (58)	58 (42)	4.39	2.25, 9.00	2.76	1.31, 6.07
Family history of cancer						
No	80 (47)	89 (53)	Referent	–	Referent	–
Yes	63 (47)	70 (53)	1.00	0.64, 1.58	1.21	0.73, 2.02

^a Adjusted for other variables in the table

have knowledge of biospecimens as those with less than high school education (OR, 2.76; 95 % CI, 1.31, 6.07) (Table 2).

Thirty six percent of respondents had a positive intention to donate biospecimens for research in the future. In bivariate

analyses, African-American race (compared to Whites), less than high school education, and lack of knowledge on biospecimens were inversely associated with intent to donate biospecimens (Table 3). After adjusting for multiple

Table 3 Association of biospecimen donation intent with socio-demographic characteristics among survey participants

Characteristic	Donation intent <i>N</i> (%)		Unadjusted odds ratio	95 % confidence intervals	Adjusted odds ratio ^a	95 % confidence intervals
	Yes (36 %)	No (64 %)				
Age, mean years (SD)	43.0 (14.9)	43.0 (16.6)	1.00	0.93, 1.08	1.02	0.94, 1.11
Sex						
Male	59 (37)	100 (63)	Referent	–	Referent	–
Female	46 (34)	89 (66)	0.88	0.54, 1.41	0.84	0.50, 1.40
Race						
White (non-Hispanic)	23 (49)	24 (51)	Referent	–	Referent	–
Hispanic	8 (57)	6 (43)	1.39	0.42, 4.82	1.71	0.50, 6.51
African-American/Black	68 (31)	148 (69)	0.48	0.25, 0.91	0.84	0.50, 1.40
Education						
<High school	13 (22)	45 (78)	Referent	–	Referent	–
High school and some college	38 (36)	67 (64)	1.96	0.96, 4.21	1.60	0.75, 3.54
College graduate or higher	57 (41)	82 (59)	2.41	1.22, 5.02	1.59	0.73, 3.58
Family history of cancer						
No	57 (34)	112 (66)	Referent	–	Referent	–
Yes	51 (38)	82 (62)	1.22	0.76, 1.96	1.26	0.76, 2.10
Knowledge of biospecimens						
No	43 (27)	116 (73)	Referent	–	Referent	–
Yes	65 (45)	78 (55)	2.25	1.40, 3.65	1.91	1.12, 3.27

^a Adjusted for other variables in the table

covariates (Table 3), only knowledge regarding biospecimens was significantly associated with donation intent (OR, 1.91; 95 % CI, 1.12, 3.27).

The most important factor determining donation intent in the survey was “not knowing how the biospecimens will be used” (60 %) followed by “lack of knowledge about biospecimens” (28 %), “confidentiality concerns” (17 %), and “fear of discomfort from biospecimen collection” (15 %).

Discussion

This study contributes to the growing body of research assessing biospecimen knowledge, attitudes, and intentions among minority and disadvantaged community residents. Less than half of the African-Americans in our surveys had knowledge of the type of biospecimens. Results from the study also support our hypothesis that higher education, female gender, and race/ethnicity are associated with greater knowledge of what defines a biospecimen. After adjusting for multiple factors, only biospecimen knowledge was associated with intent to donate biospecimens.

These findings are consistent with other biospecimen research targeting minority populations. McDonald (McDonald et al. 2012) sought to identify sociodemographic characteristics, health care variables, and cultural values that had significant independent associations with intentions to donate blood or saliva samples for cancer genetics research among African-American adults. Similar to our results, McDonald et al. found that education levels had a significant positive association with donation intentions. Our survey findings also indicated that knowledge and awareness of what defines a biospecimen is less common among African-Americans and Hispanics than Whites.

Another salient finding from both the focus groups and survey were the considerable interest in biospecimen donation; positive responses ranged from “definitely consider” to “might consider.” While, African-Americans were less likely to intend to donate biospecimens than Caucasians, it was not necessarily for the reason most cited in the literature. The most common barriers to biospecimen donation among African-Americans were reported to do “not know how biospecimens will be used in research” and “lack of knowledge about biospecimens” whereas “distrust of medical community” was the least frequently reported barrier in our survey. Tuskegee or any other unethical biomedical cases were not mentioned as barriers to respondents’ willingness to donate biospecimens in the focus groups. The infamous Tuskegee Syphilis Study (Gamble 1997) and the resulting mistrust of the medical care system are often cited as the primary reason minorities, particularly African-Americans, do not participate in biomedical research. However, Brandon et al. (Brandon et al. 2005) cast doubt on the proposition that the widely

documented race differences in mistrust of medical care results from the widespread knowledge of the Tuskegee study. Results from our study support this observation. Rather, according to Brandon et al., race differences in mistrust stem from broader historical and personal experiences. These broader historical experiences relate less to well-documented cases of research malpractice, such as Tuskegee and others, but rather to the personal experience of individuals and their families as it relates to health care and participation in biomedical research. These experiences, well documented in the literature, include discrimination, racism, quality of care based on insurance status, presence of multiple comorbid conditions, lack of access to interpreters, lack of referrals to participate in clinical trials and research, and absence of culturally relevant information in hospitals and clinics (Ford et al. 2008). In our study, many focus group participants knew very little, if anything at all, about the historical research injustices like Tuskegee. However, participants discussed some of their actual lived experiences of health care providers not giving them satisfactory or complete information. Another issue mentioned by participants was the issue of trust as it relates to diversity among researchers and minority participation in research. Focus group participants discussed the need to have members of minority groups, specifically African-Americans, address community groups regarding biospecimens and their importance for research on health issues of particular importance to the African-American community. Previous research suggests that when outreach and research teams have some similarity in characteristics (i.e., race/ethnicity, gender, language) with participants, it helps to establish cultural sensitivity and also enhances participation, trust, and capacity building for future research participation.

The literature cites many of the barriers about which researchers conducting biospecimen research should be cognizant: fear, the burden associated with trial participation (i.e., time commitment, transportation, family considerations), lack of physician referral, lack of culturally and linguistically appropriate education about clinical trials, exclusion by age restriction, exclusion by comorbidities, and providers’ methods of presenting information about a trial or research study (Wallington et al. 2012; Ford et al. 2008; Schmotzer 2012). Results from our focus groups and survey suggest that among African-Americans knowledge regarding biospecimens and information on how biospecimens are used in research might be the most important factors involved in potential research participants’ decision-making process on whether to donate biospecimens. Although we cannot discount the relative importance of other barriers to biospecimen donation intent, our research suggests that an emphasis on interventions and education programs that increase knowledge of biospecimens and their importance in biomedical research among minorities might have the biggest impact on minority participation in biospecimen research. Recent studies on biospecimen research

in other communities have also highlighted the importance of public awareness of biobanking and biospecimen research in increasing research participation by community members (Rodriguez et al. 2013; Thiel et al. 2014).

In addition to its effect on increasing minority participation, education, awareness, and outreach programs can also help build trust between donors and researchers on issues related to biospecimen research. This is important because biospecimen collection occurs in a diverse variety of clinical and research contexts with varying protocols for informed consent, return of research results to participants, ownership of specimens, and utilization of specimens. When biospecimens are collected for a specific research study participants are usually informed about the purpose of the study and how their biospecimens will be used to achieve study aims. However, most specimens in biobanks are residual samples originally collected for clinical care at clinics and hospitals and stored for use in future research (Henderson et al. 2013). Results from a recent survey of 261 biobanks reported that although 96 % of biobanks inform the donors that their specimen will be stored, a vast majority of the banks (79 %) use a broad/global consent for biospecimen use (Edwards et al. 2014). It is not possible in these situations to provide donors with details on how their specimens will be used in the future and findings from our study indicate this is one of the major barriers for minority participation in biospecimen research. Education interventions that highlight the necessity and importance of biospecimen storage for future research needs might address this barrier in minorities thus increasing participation and trust in biospecimen research.

When considering the results of the present study, some limitations should be noted. Due to the cross-sectional nature of this study, no inferences can be drawn regarding causality. Further, the results are representative of small convenience samples in two small urban neighborhoods; therefore, findings may not be generalized to other neighborhoods or other geographic regions. Ability to speak and understand English was an eligibility criteria in our study and all study questionnaires were administered in English. Therefore, only English-speaking Hispanics are represented in our survey and our results might not be generalizable to all Hispanics. Additionally, although we focused on sociodemographic variables, social-cultural factors (i.e., attitudes, cultures, health behaviors) have been found to have a significant impact on cancer health disparities and biospecimen collection (Loffredo et al. 2013; Smedley et al. 2003; Ramirez et al. 2006; Betancourt and Renfrew 2011), it is possible that some of the sociodemographic factors associated with biospecimen knowledge might actually relate to sociocultural factors such as social acculturation, collectivism, and family values. Future research should evaluate whether these sociocultural factors may explain some of the racial, gender, and education-specific differences we observed in biospecimen knowledge in our

study. In addition, although the survey had one multiple-choice question on “barriers to biospecimen knowledge” the list of barriers was not exhaustive. For example, we did not ask participants whether “return of results” or “incidental findings” was possible barriers to biospecimen donation. Finally, the focus group discussions did not delve deeply on participants’ personal or perceived disease risk. However, discussion around medical and family history highlighted participants’ concerns related to personal risk. Future qualitative aspects of mix-methods studies exploring biospecimen awareness and participation should delve more into medical and family history and perceived risk.

This study highlights racial/ethnic, gender, and education differences in biospecimen knowledge in an underserved, urban community in Washington, DC. In addition, we identified biospecimen knowledge as the only significant predictor of biospecimen donation intent for research, and also identified education status, lack of information on how biospecimens will be used, and lack of discussion/information regarding biospecimens as participant-reported barriers to participation biospecimen research among African-Americans. Our findings should be replicated in future studies that include sociocultural predictors in addition to sociodemographic factors as possible predictors of biospecimen knowledge and donation intent among minority populations in the USA. Finally, trials of biospecimen knowledge-based interventions should be conducted to determine whether these interventions increase participation intent and participation in biospecimen research among minorities.

Acknowledgments We acknowledge Robert Aiken for his assistance in survey data collection.

This work was supported by the National Cancer Institute at the National Institutes of Health [grant number U01 CA114593 (J.M.), grant number 2K05CA096940 (J.M.) and 3P30CA051008-18S2 (L. L. A.)].

Compliance with ethics guidelines All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study. No identifying information is included in this article.

Conflict of interest Chiranjeev Dash, Sherrie F. Wallington, Sherieda Muthra, Everett Dodson, Jeanne Mandelblatt, and Lucile L. Adams-Campbell declare that they have no conflict of interest.

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