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The Dissection Room Experience: A Factor in the Choice of Organ and Whole Body Donation—A Nigerian Survey

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The psychosocial impact of human dissection on the lives of medical and health science students has been noted. To assess the impact of the dissection room experience on one's willingness to become a whole body and organ donor, the attitudes of 1,350 students and professionals from the medical, health, and non-health related disciplines to body and organ donation were studied. The participants were broken into categories according to degree of exposure to human dissection. Participants who were never exposed to the dissection experience showed more willingness to donate their bodies than those who were exposed. With the exception of the physiotherapy department, the students and professionals from the health science departments who were exposed to the dissection room but never engaged in dissection showed the most unwillingness to donate their bodies ($P < 0.001$). An unwillingness to donate oneself was noted as one of the negative impacts associated with exposure to the dissection room. Willingness to donate an organ correlated positively with the level of exposure to the dissection room ($P < 0.001$). Most of the reasons for unwillingness were traceable to negative perceptions of the dissection room as a result of poor and disrespectful management of the human cadavers. *Anat Sci Educ* 7: 56–63. © 2013 American Association of Anatomists.

Key words: organ donation; cadaver dissection; gross anatomy laboratory; psychosocial impacts; anatomy education; altruism; whole body donation

INTRODUCTION

The issue of body donation has gained attention recently, especially with regards to the role that human dissection plays in the training of medical students. In Nigeria, the practical component of gross anatomy education has been limited to cadaveric dissection since its inception in 1948 (Ekanem and Eluwa, 2006), and this remains the situation for most other African countries (Gangata et al., 2010). More than 90% of Nigerian medical schools run a dissection-based anatomy curriculum (Anyanwu et al., 2011). The cadavers used for this program are predominantly executed criminals and suspects that were shot during pursuit and arrest (Gangata et al., 2010; Anyanwu et al., 2011). While the dissection

laboratory has been reported to provide educational opportunities at various levels (Dinsmore et al., 2001; Mc Garvey et al., 2001), uncomfortable emotional experiences and even psychiatric problems have been attributed to it (Horne et al., 1990; Dickinson et al., 1997; Marks et al., 1997). Human dissection has been demonstrated to significantly modulate one's emotional reactions, attitudes, and beliefs (Evans and Fitzgibbon, 1992; Charlton et al., 1994; Vaz et al., 1998; Arráez-Aybar et al., 2004, 2008; Vijayabhaskar et al., 2005). Dismore et al. (2001) reported its impact on both the emotional and intellectual aspects of participants. This psychosocial impact has attracted the attention of many researchers of various nationalities (Penney, 1987; Gustavson, 1988; Tuohimaa et al., 1993; Dickinson et al., 1997; Horne et al., 1990; Evans and Fitzgibbon, 1992; Botega et al., 1996; Marks et al., 1997; Lempp, 2005; Quince et al., 2011; Böckers et al., 2012; Kotzé and Mole, 2013). Finkelstein and Mathers (1990) portrayed it as one of the acts that are clearly outside the range of usual human experience, which retains the ability to elicit most of the symptoms of post-traumatic stress disorder. Similar research conducted in Nigeria does not differ with regards to the responses of medical students to the dissection room experience (Anibeze, 2001; Egwu et al., 2008; Izunya et al., 2010; Oyeyipo and Falana, 2012). According to Oyeyipo and Falana (2012), 36.7% of medical students surveyed reported stress, anxiety, and other

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Received 5 November 2012; Revised 10 February 2013; Accepted 2 April 2013.

Published online 6 May 2013 in Wiley Online Library (wileyonlinelibrary.com). DOI 10.1002/ase.1370

discomforts in the dissection room. This result also agreed with the survey made by Nnodim (1996), where a third of the sample of preclinical students from the University of Benin in Nigeria identified the dissecting room as a significant source of stress.

Contrary to these views, positive emotions and favorable attitudes toward dissection have also been reported in the literature (Shaida et al., 1993; Tuohimaa et al., 1993; Romero, 2010; Mulu and Tegabu, 2012). It has been described as a laboratory for self-discovery (Bertman and Marks, 1989), which provides the students' first encounter with a "patient," predicting, to a great extent, the coping mechanisms utilized by each student (Finkelstein and Mathers, 1990). The student-cadaver relationship has been repeatedly reported to form the model for the future doctor-patient relationship (Evans and Fitzgibbon, 1992; Charlton et al., 1994; Temkin et al., 2002).

The sustainability of any cadaver-based curriculum depends upon a viable body donation program. This could account for the volume of research reports on body donation available in medical literature. Some of the reports have broadly characterized donors to medical school programs (Richardson and Hurwitz, 1995; Dluzen et al., 1996), while others have analyzed the characteristics of whole body donors from non-donors (Sanner, 1994; Dluzen et al., 1996). Some of the factors reported in the literature that determine the attitudes of individuals to organ and whole body donation include demographic, socioeconomic, attitudinal, and medical. Some of the demographic and socioeconomic factors include: age, gender, race/ethnicity, education, and employment (Boulware et al., 2002, 2004; Alashek et al., 2009; Perry and Ettarh, 2009; Park et al., 2011; Rokade and Gai-kawad, 2012; Halou et al., 2013). Despite the magnitude of attention these psychosocial impacts have attracted, little attention has been given to how the dissection room experience impacts the willingness of individuals to participate in organ and whole body donation.

Most profiles of body donors have also shown medical doctors and other health-related professionals to be very unwilling to become whole body donors (Fennell and Jones, 1992; McClea and Stringer, 2010). Exposure to the dissection room is a factor which has been proposed to have the potential to affect medical students' willingness to donate their bodies for medical education (Cahill and Ettarh, 2008). Given the pivotal role medical students and professionals play in the realization of the goal of body bequest programs, it is important to determine the impact that varying levels of exposure to dissection has on the attitudes of Nigerian physicians, health workers, and medical students to organ and whole body donation.

MATERIALS AND METHOD

Six universities and four teaching hospitals in Nigeria were randomly selected for this study. Questionnaires adapted from the works of Ballala et al. (2011) were distributed to 1,350 randomly selected professionals and students from selected universities and teaching hospitals, along with adult individuals from the general public. Participation in the study was voluntary and anonymity was guaranteed. The questionnaires were personally distributed to the participants and collected the same day by interviewers who were distributed into research teams. The participants were divided into two main categories: professionals and students. Each category

was further divided into three groups: A, B, and C. Group A in both categories was made up of participants that have engaged in dissection. For the student category, this group was selected from students from the faculties of Medicine, Dentistry, and the departments of Medical Rehabilitation and Anatomy, while members of the professional category were selected from medical doctors, dentists, physiotherapists, and anatomists. Group B for both categories consisted of respondents that, although not involved in dissection, had been exposed to a dissection room. These were participants that have been taught with prosected specimens, macerated bones, and eviscerated organs from human cadavers, or who have otherwise witnessed dissections. Respondents among the student category came from the departments of nursing sciences, medical laboratory sciences, and medical radiography. Respondents among the professionals in this group included nurses, medical laboratory scientists, and medical radiographers. Since members of both groups A and B had been exposed at various levels to the experience of the dissection room, they were collectively termed "Respondents exposed to dissection room." The respondents in group C included those who had neither dissected nor had any form of exposure to the experience of the dissection room, and these individuals were thus termed "Respondents never exposed to dissection room." This group included students from other faculties outside of the medical and health sciences, such as law, business administration, and mass communication, among others. Lawyers, engineers, traders, artisans, non-medical lecturers, and other graduates outside the college of medicine made up the respondents in the professional category for this group.

The questionnaires included data on participants' age, sex, profession, knowledge of the practice of both body and organ donation, willingness to be both organ and whole body donors, reasons for unwillingness, and also willingness to be involved in the campaign on organ and whole body donation. The data for this study was collected in 2011. Approval was granted by the ethical research committee at the University of Nigeria, Enugu Campus. Out of the 1,350 questionnaires distributed to participants for this study, only 1,200 properly filled forms were analyzed. Data were compiled and descriptive and comparative analyses were carried out using SPSS statistical package, version 15.0 (SPSS Inc., Chicago, IL). Statistical differences among groups were accessed using chi-square tests and Fisher's exact test. Results were expressed as percentages of the total study population.

RESULTS

Data generated from the 1,200 completed questionnaires were used in the analyses (response rate 89%). Out of the analyzed data, 780 (65%) were students while 420 (35%) were professionals. Of these, 479 (40%) were male students, while 301 (25%) were female students, and 269 (22%) were male professionals, and 151 (13%) were female professionals. There were 761 (63%) respondents exposed to dissection rooms, while 439 (37%) respondents were never exposed. Table 1 gives a summary of the distributions of participants based on gender and the degrees of exposure to dissection rooms. A summary of attitudes of participants to organ and whole body donation based on exposure to the dissection room can be found in Table 2. The reasons for un-willingness to become whole body donors are summarized in Figure 1. The attitudes of the respondents in both student and professional categories to whole body donation are summarized in

Table 1.

Distribution of Survey Participants Based on Gender and Degree of Exposure to the Dissection Room

Cohort of participants	Males <i>N</i> (%)	Females <i>N</i> (%)	Both <i>N</i> (%)
Students with dissection experience	178 (61)	112 (39)	290 (100)
Students exposed to dissection room without dissection experience	135 (61)	85 (39)	220 (100)
Students never exposed to dissection room	166 (62)	104 (38)	270 (100)
Professionals with dissection experience	78 (64)	44 (36)	122 (100)
Professionals exposed to dissection room without dissection experience	83 (64)	46 (36)	129 (100)
Professionals never exposed to dissection room	108 (64)	61 (36)	169 (100)

Table 3. A statistically significant difference was observed between the attitudes of the students and those of the professionals ($P < 0.001$). Attitudes of participants to whole body donation varied significantly from that of organ donation ($P < 0.001$). Respondents never exposed to dissection room were more willing (17%) to be involved in body bequest programs than those exposed to dissection rooms (13%).

DISCUSSION

These data demonstrated that participants that have some level of exposure to dissection rooms are less likely to bequeath their bodies to medical schools for dissection and research. Such a result suggests that the unwillingness to donate oneself may be one of the negative impacts of exposure to the dissection room. Views on the impact of dissection on medical students have varied considerably in the literature. Various degrees of negative impact have been expressed by other authors, (Gustavson, 1988; Finkelstein and Mathers, 1990; Abu-Hijel et al., 1997; Dinsmore et al.,

1999, 2001; McGarvey et al., 2001). Some of these negative reactions to the dissection room include nausea, fainting, disgust, headache, loss of appetite, nightmares, intrusive visual images, insomnia, depression, and learning difficulties, (Marks and Bertman, 1980; Penney, 1985; Shalev and Nathan, 1985; Gustavson, 1988). Abu-Hijel et al. (1997) in a study of Arab medical students reported recurring visual images of cadavers and temporary loss of appetite as the most frequent reactions in their study.

The unwillingness to donate oneself is relatively common among medical doctors and other allied medical personnel in various parts of the world. At Otago Medical School in New Zealand, Fennell and Jones (1992) noted a limited number of donors (11.8%) from health care related professions with only one doctor willing to donate from their survey of 169 participants. Later in 2010, similar work repeated by McClea and Stringer (2010) only recorded a few willing respondents from health care professions, of whom none was a medical doctor. In a survey of cadaver donor applications in Ohio, Lagwinski et al. (1998) noted a much lower result, where

Table 2.

Summary of Attitudes of Participants Towards Organ and Whole Body Donation Based on Exposure to the Cadaver Room

Attitudes towards body and organ donation	Distribution of participants		<i>P</i> value
	Exposed to dissection room <i>N</i> (%)	Never exposed to dissection room <i>N</i> (%)	
Aware of body bequest program	527 (68)	277 (64)	< 0.0001
Aware of organ donation program	695 (92)	371 (84)	< 0.0001
Willing to donate their body	105 (13)	70 (17)	0.086
Willing to donate their organs	415 (55)	222 (49)	0.001
Plan to donate organs in future	218 (27)	126 (27)	0.371
Willing to be involved in campaigns for body donation	305 (39)	110 (25)	< 0.0001
Willing to be involved in campaigns for organ donation	271 (38)	157 (37)	< 0.0001

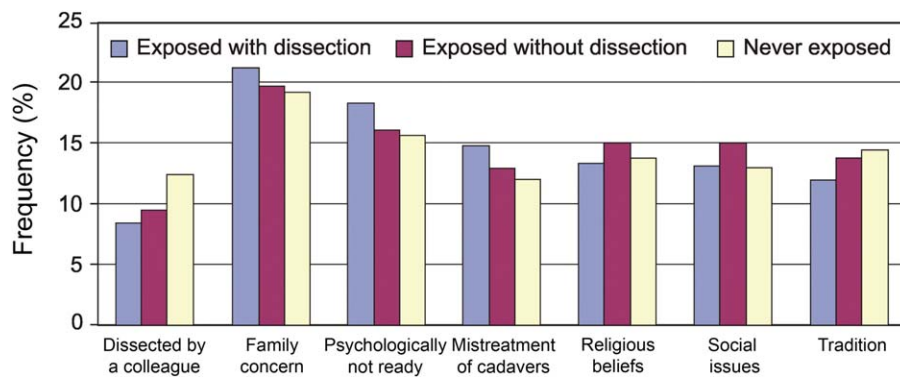


Figure 1.

Reasons for unwillingness to donate one's own body among participants of the survey that were exposed to the dissection room with or without performing dissection, and likewise for those who were never exposed to the dissection room.

health care-related professionals accounted for only approximately 7.3% of applicants. While studying the knowledge, attitudes, and practices regarding whole body donation among medical professionals in a hospital in India, Ballala et al. (2012) noted that only 22% of the physicians were willing to donate their bodies, while 68% expected others to donate their bodies. In a recent survey of registered donors in New Zealand, Ireland, and South Africa, Cornwall et al. (2012) noted that professional and managerial occupations were conspicuously absent from donor groups, with the exception of those in Ireland. Similar results have been reported in most studies on the willingness of anatomists to donate their bodies (Arráez-Aybar, 2004; Serhirli et al., 2004; Anyanwu and Obikili, 2012).

Methods to counter some of the problems associated with the dissection room experience have been explored and prominent among them remains participants' use of coping mechanisms. Some of the coping mechanisms already explored included prayers and reading of spiritual books, denial, humor, relaxation, help from peers, help from staff, rationalization, use of tranquilizers, and seeking advice (Gustavson, 1988; Horne et al., 1990; Druce and Johnson, 1994; Abu-Hijel et al., 1997; Kotzé and Mole, 2013). Böckers et al. (2012) introduced a repeated "step-by-step" approach of introducing students first to prosected body specimens before eventually introducing them to the proper dissection experience. They noted this method reduced the level of mental stress on students during the first day in gross anatomy laboratory, especially among female students. By including the participation of third year medical students in the dissection room during the first year students' first day of dissection, Houwink et al. (2004) were able to significantly reduce the level of emotional and physical stress associated with the initial dissection experience. The ability to control one's emotional response to death has been noted as one of the earliest training experiences a 21st-century health professional ought to be given (Arráez-Aybar et al., 2008). The impact of these mechanisms with regard to preparing students and health professionals to transit from being dissectors to becoming the dissected remains a gray area.

Awareness and Willingness to Donate

While awareness of body donation was significantly higher in the sampled population exposed to the dissection room, participants that were never exposed to dissection were more willing to donate. The high level of awareness noted in the study for the exposed and unexposed participants to both whole body and organ donation does not compare with the few numbers of willing donors. Awareness in this study and in a previous report (Anyanwu and Obikili, 2012) does not reflect a willingness to donate. The level of awareness of body bequest programs noted in the general population of this study was comparably higher than those recorded by Rokade and Gaikawad (2012) in a similar population in India.

The Gender Factor

In a survey of Swedish citizens, Sanner (1994) presented gender as one of the factors that played a role in determining the outcome of individuals' decision towards whole body donation. This study agrees with the works of Abu-Hijel et al. (1997), which reported female students to be more disturbed by some of the various stimuli from the dissection room and also exhibited higher levels of fear and stronger physical and behavioral reactions. This could also account for some of the observed gender disparity in individuals' willingness to become donors. Rokade and Gaikawad (2012) reported that females were more unwilling to donate their bodies. Similar results have been highlighted in the literature (Sanner, 1994; Boulware et al., 2004; Alashek et al., 2009).

Willingness Between Medical Students and Professionals

This study's results for the level of willingness for whole body donation for both students and professionals were lower than those reported by Rokade and Gaikawad (2012) in India. Compared against 17 and 20% levels of willingness for medical students and professionals respectively in the

Table 3.

Distribution of Participants with Specific Attitudes Towards Organ and Whole Body Donation in Regards to Varying Degrees of Exposure to the Dissection Room

Participants	Professionals N (%)			Students N (%)			P value
	Males	Females	Both	Males	Females	Both	
Aware of body bequest program							
Dissection experience	65(83)	28(65)	93(76)	134(75)	87(78)	221(75)	
Exposed but never engaged in dissection	55(67)	24(53)	80(62)	76(57)	56(66)	133(60)	< 0.0001
Never exposed	71(66)	42(69)	113(67)	97(59)	67(67)	164(61)	
Willing to donate their own bodies for dissection							
Dissection experience	17(22)	12(28)	30(24)	35(20)	15(13)	50(17)	
Exposed but never engaged in dissection	0(0)	2(5)	2(2)	18(13)	5(6)	22(10)	0.003
Never exposed	27(25)	8(13)	35(21)	22(13)	13(13)	35(13)	
Willing to be involved in campaigns on body donation							
Dissection experience	33(42)	13(29)	46(38)	85(48)	47(42)	133(45)	
Exposed but never engaged in dissection	31(38)	18(39)	49(38)	54(40)	24(24)	78(35)	< 0.0001
Never exposed	31(29)	10(16)	41(24)	45(27)	24(23)	69(26)	
Aware of organ donation program							
Dissection experience	75(96)	41(94)	116(95)	163(92)	105(94)	269(91)	
Exposed but never engaged in dissection	83(100)	41(90)	124(97)	116(86)	70(82)	186(84)	< 0.0001
Never exposed	90(84)	50(82)	140(83)	147(89)	83(80)	230(85)	
Willing to donate their organs							
Dissection experience	51(66)	29(66)	80(66)	106(60)	75(67)	181(61)	
Exposed but never engaged in dissection	46(56)	22(47)	68(53)	56(42)	30(36)	86(39)	< 0.0001
Never exposed	50(46)	23(39)	73(43)	100(60)	49(47)	148(55)	
Have plans for organ donation in the future							
Dissection experience	13(16)	13(29)	25(21)	62(35)	46(41)	108(37)	
Exposed but never engaged in dissection	28(33)	5(11)	33(26)	33(25)	18(22)	52(23)	0.090
Never exposed	22(20)	14(24)	36(21)	54(33)	35(34)	90(33)	
Willing to be involved in campaigns on organ donation							
Dissection experience	36(46)	13(29)	49(40)	50(28)	36(32)	86(29)	
Exposed but never engaged in dissection	46(56)	24(53)	70(55)	42(59)	23(27)	65(29)	< 0.0001
Never exposed	43(40)	25(41)	68(40)	54(33)	35(34)	90(33)	

present study, they noted 42.7% and 47.2% for the similar groups. The level of willingness for whole body donation among the medical students, when compared with that of

medical professionals, is lower. A significant difference between the responses of medical students and those of professionals has also been noted in previous studies (Rokade

and Gaikawad, 2012). This difference suggests a level of adjustment in the responses of medical professionals who are older, already in practice, and have more understanding of the need for the altruistic act of body donation. Arráez-Aybar and colleagues (2008) noted that responses to physiological and motor emotional reactions of individuals manifesting anxiety and fear stimulated by the dissection room experience diminish as they gain more experience in dissection.

Participation in Dissection; A Factor in Determination of Attitude to Whole Body and Organ Donation

The present study demonstrates a significant difference in the attitudes to whole body and organ donation between the dissecting and non-dissecting participants who have been exposed to dissection in both the professional and student categories. The participants that were exposed to the dissection room but never dissected were less willing to donate both their organs and bodies. These were participants familiar with the sights and smells of the cadaver, as well as all other factors that are associated with the dissection room. High to moderate levels of death anxiety have been reported to be common among medical, occupational therapy, and dentistry students, as well as among non-dissecting health science students (Limonero, 1997; Arráez-Aybar et al., 2008). The responses to this death anxiety and other issues associated with dissection have also been noted to vary between dissecting and non-dissecting students (Busquet and Pujol, 2001). Such variation brings up the question: "Does participation in dissection empower individuals to control their fears better than non-dissecting counterparts equally exposed to the dissection room?" Arráez-Aybar et al. (2008) noted that practice gives students control over their emotions and increases their concentration on the task at hand. Limonero (1997) observed that subjects who had no prior contact with death showed more fear of such unfamiliar experiences. Kaye and Loscalzo (1998) have suggested exposure to death is one of the factors that may help students to confront it. According to this result, it appears that, for non-dissecting students that eventually become professionals who have never dissected, such individuals will never achieve the opportunity to confront their fears and emotions concerning the dissection room. This could also account for this group being the most unwilling to donate their bodies and organs both in the professional and student categories.

Attitudes to Whole Body Donation Compared with Organ Donation

Levels of awareness and willingness to be part of enlightenment campaigns were higher for organ donation than cadaver donation. This could have also contributed to the reason that participants in all categories were more disposed to donating their organs than their bodies. The disparate attitude of anatomists, physicians, and the general public to organ and body donation is well-documented in medical literature (Bapat et al., 2010; Rokade and Gaikawad, 2012). In a study of Spanish anatomists, Conesa et al. (2003) noted that anatomy teachers were generally in favor of organ donation alone, and later, in 2004, they also noted that that 88% of the physicians in southeastern Spain were in favor of cadaveric organ donation (Conesa et al., 2004). A similar study on Nigerian

anatomists also demonstrated the same trend (Anyanwu and Obikili, 2012). Cahill and Ettarh (2011) reported a generally positive attitude to postmortem organ donations among Irish students who were willing to donate their organs and were supported in their decision by family members.

REASONS FOR UNWILLINGNESS

For the three categories of participants, family concern rated highest, followed by not being psychologically ready. Family concern in earlier reports has also been identified as the primary reason for unwillingness to donate oneself among Nigerian anatomists (Anyanwu and Obikili, 2012). Beyond the two factors above, the rest of the reasons varied for the three categories: while anxiety related to mistreatment of cadavers was next for the exposed and dissecting category, religious belief took that position for the exposed and non-dissecting category. Rokade and Gaikawad (2012) noted that the anxiety related to mistreatment of cadavers expressed by many medical professionals is another indication of the fact that they are not satisfied with the manner in which cadavers are handled by students and staff of anatomy departments. The two main reasons common to the three categories are all rooted to poor perception of the dissection room by these participants. This point is emphasized by the third reason for unwillingness in the dissecting participants. This implies that whatever perception people are allowed to leave the dissection room with will either increase or decrease the availability of bodies for dissection. When a cadaver is mistreated, it seems to create a negative impression in the minds of the students and professionals studying these cadavers.

Cadaver Dissection Room Conditions

Earlier studies on the dissection room and the dissection experience have revealed some of the aspects that have affected the attitudes of medical students in the study of anatomy which could also be affecting individuals' willingness to participate in body donation. Some of these conditions include: the unsightly look and smell of cadavers (most especially when not professionally preserved), the smell and irritation of chemical preservatives (most especially formalin), fear of infection, views of certain parts of the cadaver, touching certain aspects of the cadavers, and actual dissection of the cadaver (Horne et al., 1990; Nnodim, 1996; Abu-Hijelh et al., 1997; Mulu and Tegabu, 2012). The actual process of dissection may not have as much of a negative impact on students as much as the smell and irritation of the chemical preservatives, the effect of which has been noted by most authors (Abu-Hijelh et al., 1997; Bataineh et al., 2006; Mulu and Tegabu, 2012). Some of the factors that induce these negative effects are more pronounced in most medical schools in Africa (Gangata et al., 2010), including Nigeria (Anyanwu et al., 2011; Peter et al., 2012). Dissection rooms are overpopulated and poorly ventilated (Egwu et al., 2008), with cadavers arriving at these schools in very deplorable states, sometimes riddled with holes in some parts of the body, deep, gaping wounds, broken skulls and limbs, and soft tissues at various degrees of decomposition (Anyanwu et al., 2011). This image in the minds of candidates exposed to dissection may not only affect their attitudes to dissection, but also their attitudes towards donation of oneself.

CONCLUSION

This study identifies the unwillingness to donate oneself as one of the negative impacts of the dissection room. This suggests that the perceptions medical students and professionals have concerning the dissection room could negatively affect the availability of donated bodies. Participants that never dissected but were exposed to the dissection room were the least likely to donate their bodies. At the root of the reason for unwillingness among the dissecting group is the mistreatment of cadavers. This explains the reason that medical professionals trained using donated bodies are reluctant to donate their own bodies to medical education (Rokade and Gaikawad, 2012). Strong sanctions should be imposed on indecent treatment of cadavers by staff and students. Sourcing of cadavers from unclaimed corpses and executed criminals, unhygienic dissection environments, improper management of waste from cadavers, and some other unethical issues are still problematic in most medical schools in Nigeria and other countries in Africa (Gangata et al., 2010; Anyanwu et al., 2011). These are factors identified to stimulate negative dissection experiences (Bataineh et al., 2006; Mulu and Tegabu, 2012), which will ultimately affect the exposed candidate's willingness to donate oneself. The ability to correct these factors in this environment will create better dissection room experiences that will improve candidates' attitudes to whole body donation. The creation of more opportunities in medical school curricula for non-dissecting students who are exposed to the dissection room but do not participate in dissection is advised (Catty and Tamlyn, 1985). This will increase their familiarity with the cadaver, giving students the opportunity to dispel their perceived fears about the dissection room, while also enlarging their knowledge on the sourcing, management, and ethical values on the use of cadaver. If health care professionals who are at the frontline of the campaigns on body and organ donations lack personal conviction on the need for such donations, it will be difficult to make any positive impact on the larger society.

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