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Gender Effects on Physical Reactions of Health Science Students at First Encounter with Cadaver Using Pearson Chi-Square Test

[1]M.S. Ajao, [1]T.A. Alimi, [2]W.B. Yahya, [3]O.O. Eweoya, [1]O.R. Jimoh and [1]A. Olawepo
[1]Department of Anatomy, Faculty of Basic Medical Sciences,
College of Health Sciences, [2]Department of Statistics,
Faculty of Sciences, University of Ilorin, Ilorin, Nigeria
[3]Department of Anatomy, College of Health Sciences,
Ladoke Akintola University of Technology, Ogbomoso, Nigeria

Abstract: In this study, the reactions of health science students at their first sight to cadaver examined. Two hundred and fifty undergraduate students of the Department of Anatomy from two universities in Nigeria (University of Ilorin, Ilorin and Ladoke Akintola University of Technology, Ogbomoso) studied for their physical and emotional reactions at their first encounter with cadaver. The data collected on these students are subjected to relevant statistical analysis and by Pearson Chi-Square test procedures it revealed that students' reactions in this regard are gender sensitive with female students being more susceptible to physical and emotional instability than their male counter parts.

Key words: Gender effects, first sight, physical reactions, health science students, cadaver, pearson chi-square test

INTRODUCTION

The practice of anatomical dissections of dead body (cadaver) has been in the curriculum of medical education since the Renaissance (Javadnia *et al*., 2006) and the experience of viewing cadaver is an important tool in teaching medical students the trait of 'detached concern' that enables them to practice medicine efficiently (Fox, 1988). Several authors are of the opinion that dissection of human body is an efficient tool of teaching human anatomy (Hartmann, 1978; Jones, 1997; Dinsmore *et al*., 1999; Hill and Anderson, 1991). In their opinions, they believed that autopsies often uncover difficulties in clinical, radiological and *in-vivo* pathological diagnoses, eventually expose the students to a lot of medical fallibilities and uncertainties (Mclachian *et al*., 2004). However, some scholars are of the opinion that human anatomy and pathology can be taught effectively without students contacts with the dissected human body. They conclude that medical students who learn human anatomy by prosections and audiovisuals perform just as well in anatomy examinations as those who learn by dissections (Blunt and Blizard, 1975; Druce and Johnson, 2005; Cahill and Leonard, 1997; Nnodim *et al*., 1996). The three dimensionality in human body as well as normal variations in human anatomy is better appreciated and understood when cadaver is dissected (Graney, 1996; Marks, 1996; Willan and Humpherson, 1999).

Studies have shown that no experience has a more profound impact on health science students than their first encounter with cadaver (Abu-Hijleh *et al*., 1997; Hafferty, 1988; Fox, 1989; Magee *et al*., 1999; McGarvey *et al*., 2001). However, having contact with cadaver for the first time can be highly stressful to some students (Parker, 2002). Therefore, it is important to study the gender influence on the various physical and emotional distresses and responses of these students at their first encounter with dead human bodies.

MATERIALS AND METHODS

In this study, questionnaires were administered on 250 sec year anatomy students of two universities in Nigeria-130 students from University of Ilorin, Ilorin, Nigeria and 120 students from Ladoke Akintola University of Technology, Ogbomoso, Nigeria. The main objective is to elicit information on their physical and emotional responses at their first contact with dead human bodies (cadaver) in anatomical dissecting laboratories of their respective institutions. The major physical and emotional

Corresponding Author: Ajao Moyosore Salihu, Department of Anatomy, Faculty of Basic Medical Sciences, University of Ilorin, Ilorin, Nigeria

reactions on which these students were measured include scaring, shocking, tears shedding, choking, nausea, severe depression and nightmare. These seven psychological reactions are categorize into three groups based on the similarity of their characterized symptoms as follows, scaring, shocking and tears shedding, severe depression and nightmare and choking and nausea. The exhibition (yes) or non-exhibition (no) of any of these three groups of physical reactions by students is then cross- classified against their gender. The influence of the students' age is ignored in this study. This is because about 85% of the students studied from the 2 universities were within the age bracket 18-24 years, an indication that the influence of age differences on physical responses of students would be highly negligible.

Data analysis: The analysis of the data obtained from the two universities (sub-populations) were considered by the use of 2×2 contingency tables on the two factors A (gender) and B (physical reactions) as presented in the Table 1-3. Specifically, we consider a set of tables where the number of students that exhibited physical reaction of scaring, shocking and/or tears shedding is cross-classified against their gender. The sampling scheme adopted here assumes that the marginal totals $n_{1.i}$ and $n_{2.i}$ are fixed and the over all hypothesis of no partial association (independency) between the two factors is given by:

H_0 : $d_1 = d_2 = 0$ vs.
H_1 : $d_1 \neq d_2 \neq 0$.
H_0 : $\alpha_1 = \alpha_2 = 1$ vs.
H_1 : $\alpha_1 \neq \alpha_2 \neq 1$.

The combined data obtained from the two universities on the three groups of students' physical reactions presented in tables, the estimates of the power divergent goodness-of-fit test (Pearson, 1900; Cochran, 1952, 1954) computed and P-value<0.05 considered significant with 1 degree of freedom.

RESULTS

A total of 250 students respondent were evaluated from both Universities (130 from University of Ilorin and 120 from Ladoke Akintola University). Of the total respondents, 141 (56.4%) are males while 109 (43.6%) are females and 74 (56.9 5%) and 56 (43.1%) account for the males to females ratio from University of Ilorin, while in Ladoke Akintola University, the male to female ratio was 67 (55.8%) and 53 (44.2%), respectively. Of the total respondent, 90 (36%) males and 101 (40.4%) females are scared, shocked and shared tears while 51 (20.4%) males and 8 (3.2%) females are in the negative. The chi-square value was 28.32 ($p<0.05$) (Table 1). Seventy-two (28.8%) of the respondent males and 102 (40.8%) females express

Table 1: Cross-classification of the physical responses "scarring, shocking and tears "against gender

	University of Ilorin, Ilorin, Nigeria			Ladoke Akintola University, Ogbomoso, Nigeria			Both Universities		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Male	41 (53.4)	33 (21.6)	74	49 (55.3)	18 (11.7)	67	90 (107.7)	51 (33.3)	141
Female	51 (39.6)	5 (16.4)	56	50 (43.7)	3 (9.28)	53	101 (83.3)	8 (25.7)	109
Total	92	38	130	99	21	120	191	59	250
	n = 250			$\chi^2 = 28.32$			p<0.05		

Table 2: Cross-classification of severe depression and nightmares against gender

	University of Ilorin, Ilorin, Nigeria			Ladoke Akintola University, Ogbomoso, Nigeria			Both Universities		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Male	32 (47.3)	42 (26.7)	74	46 (54.2)	21 (12.8)	67	78 (107.7)	63 (33.3)	141
Female	51 (35.7)	5 (20.3)	56	51 (42.8)	2 (10.2)	53	102 (83.3)	7 (25.7)	109
Total	83	47	130	97	23	120	180	70	250
	n = 250			$\chi^2 = 79.08$			p<0.05		

Table 3: Cross-classification of physical reaction (Choking and Nausea) against gender

	University of Ilorin, Ilorin, Nigeria			Ladoke Akintola University, Ogbomoso, Nigeria			Both Universities		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Male	48 (55.8)	26 (18.2)	74	45 (51.4)	22 (15.6)	67	93 (107.2)	48 (33.8)	141
Female	50 (42.2)	6 (13.8)	56	47 (40.6)	6 (12.4)	53	97 (82.8)	12 (26.2)	109
Total	98	32	130	92	28	120	190	60	250
	n = 250			$\chi^2 = 10.22$			p<0.05		

severe depression and nightmares while 63 (25.2%) males and 7 (2.8%) have no such symptoms and the χ^2-value was 79.08 ($p<0.05$) (Table 2). In choking and nausea, 67 (26.8%) males and 97 (38.8%) females affirmed there response to these symptoms while 48 (19.2%) males and 12 (4.8%) females have no such experience (χ^2-value was 10.22 and $p<0.05$) (Table 3).

DISCUSSION

The dissection of dead human body (cadaver) is an effective and efficient procedure in teaching health science students anatomy. The physical and psychological responses of these students after such an experience, especially on their first time often provide them with a unique experience. Therefore, these students need to be mentally and psychologically prepared prior to their exposure to the dissecting room and subsequent encounter with dead human body (Hancock *et al*., 2000).

In this study, we have been able to establish that the three groups of physical reactions scaring, shocking and tears shedding, severe depression and nightmare and choking and nausea identified study are exhibited by health science students at their first encounter with cadaver are gender (dependent) sensitive with female group more susceptible than their male counterpart. Similar studies have observed and reported it their work on Post-Traumatic Stress Disorder (PTSD) and other 'negative' aftermath effects associated with the student's first exposure to cadaver (Nnodim, 1998; Tscheving *et al*., 2000; Druce and Johnson, 2005; Javadnia *et al*., 2006; O'Carroll *et al*., 2002; Snelling *et al*., 2003; Winkelmann and Culder, 2004).

Thus, it is very important for these students to received counseling before been allowed to have access to the dead bodies. Some students often drop out or changed courses because of there inability to cope with the stress associated with the sight of the cadavers. The initial exposure to dissecting room posse's emotional challenges to many students and it has been a major source of stressor to them (Nnodim, 1998; Mclachian *et al*., 2004).

CONCLUSION

We came to conclusions that even though some studies have showed that audiovisual dissections have comparable advantage over contact with cadavers, it can only complement and not a replacement. However, the students should be properly counsel to prevent the psychological stress they go through especially at there first contact.

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