



## **PERCEPTION OF FEMALE MEDICAL STUDENTS ABOUT VIRTUALIZATION OF ANATOMY IN KING KHALID UNIVERSITY**

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### **ABSTRACT**

Evolution is the essence of life, which involves adaptation in the form of change as per the need. Modern technology is the need of hour to supplement traditional didactic curriculum. Providing the dissection of human body specimen is far from enough for professional anatomy teaching. Furthermore, due to the scarcity of human bodies, most medical students cannot get anatomy operation training. This problem could be solved, via digital scanning, digital 3D reconstruction, digital anatomy operating and 3D printing, the computation technology provides the possibility. 65% of students agreed for introduction of digital media into the curriculum. Margin between ethical and unethical is hair lined and fragile while we deal with the dead. It is very important to define the boundary between judicious use, commercial exploitation and ravenous abuse of dead bodies. So 21<sup>st</sup> century tools may prove to as good supplementary or complimentary tools for teaching and may in turn help getting required respect for the dead who are dissected harshly by unknowledgeable brains in early years of medical life. We propose horizontal and vertical integration of medical curriculum and giving hands on training to all post graduates of all surgical fields and undergraduates in final years of their training

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## **INTRODUCTION**

The Internet has become a social platform where millions of health consumers access and share health information (1). One such medium, e Health (2), has brought about improvements in public health and the health care system. Medical information technology has influenced the medical profession during the last decade and will continue to make advances. For example, 3-dimensional (3D) presentation of information is being increasingly used in medical education and health care. (3)Virtual dissection have become increasingly important teaching and learning tool in medical education nowadays. Many earlier 3D (three-dimensional) models have been constructed by merging data from different subjects into one generic approximation. Ever since the advent of medicine, basic life sciences have been running parallel to therapeutic sciences in forming the concepts of human life and the treatment of diseases which threaten it. The basic requisites for understanding man's diseases come only after understanding internal structure of human's body.

## **MATERIAL AND METHODS**

This was simple proportional study consisting of 162 medical

students of level 3, 4, 5 in college of medicine .Questionnaire were distributed and collected and analyzed for the study. The data was collected by simple random sampling method. Results were analyzed by SPSS.

## **RESULTS**

93% of female medical students agreed about use of virtual dissection in learning anatomy curriculum (Table 1). Out of this 86% agreed for its making anatomy more understandable. & 9% of students said it needed to be combined with traditional methods and 61% felt it could fully replace traditional methods. 28%, 69%, 76% Agreed for its specific use in gross anatomy, embryology and neuroanatomy.

### **Past Issues**

The dissection of humans has been associated with ethical and religious issues. Throughout history, the dissection of human cadavers for medical education has experienced various cycles of legalization and proscription in different countries. But no universal prohibition of dissection or autopsy was exercised during the middle ages. Then in modern history, many scandals clouded the dissection labs. The ways to obtain a body from "front doors" were full of legal hurdles and prompting many institutions to consort to unethical means, because the only bodies legally available were those of executed criminals which were scant to meet the rising

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educational demands. In the 19th century there were increased incidents of grave robberies in the United States. The most notorious incident occurred in 1788 in New York, where a doctor waved to a child with the hand the mother's corpse that had been robbed of its grave (4). In response to this event, a law was passed in New York in 1789 that prohibited the robbing of tombs. Dealing with dead has been the issue of religion and gives every human the right of descent disposal. The ravenous abuse of dead by students with half knowledge has given rise to harsh end inside dissection rooms. Apart from formalin vapors, tears from relatives eyes could also be the issue of debate.

### Recent Advances

Dramatic advances in computer technology over the past few decades have profoundly affected health care, including the domain of medical education. Functional anatomy is a domain that involves complex spatial mental transformations of anatomical structures and movements.

Great interest have been by medical educators for years in using computer applications in medical school curricula, or in some cases replace, traditional teaching methods such as lectures, laboratories, and textbooks. In the field of human anatomy, many medical educators have turned to three-dimension computer models as a replacement means of teaching this fundamental body of knowledge. One obvious factor underlying this trend is the decreased use of human cadavers to teach anatomy. Many medical school curriculums do not include cadaver dissection labs (including eight of the eleven medical schools in Australia especially in integrated curriculum. They also conform to our results (10).

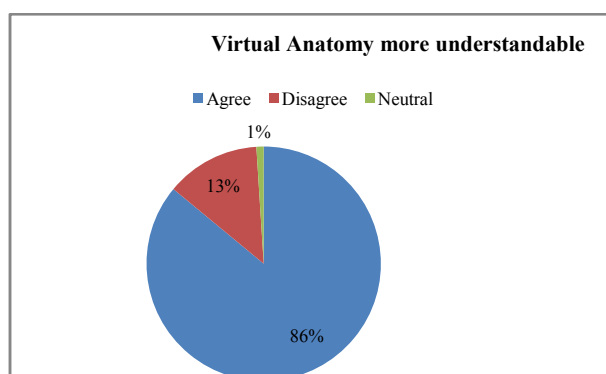
Reasons cited for this decline include the rising costs and decreasing availability of cadavers as well as the advent of new teaching methods, such as problem-based learning, which do not include dissection labs. In our study availability of modern teaching tools and rising cost of cadavers is main reason to think of an alternative.(11).

### Perception of Female Medical students about Virtualization

Table 1

Perception of Female Medical students about Virtualization of Anatomy in King Khalid University N=162		Virtualization					
Items		Yes	%	No	%	Neutral	%
1 Is virtual anatomy needed ?		150	93	12	7	0	0
2 Will it be helpfulling in making anatomy more understandable ?		139	86	21	13	2	1
3 Are Virtual anatomy and dissection both required to enhance concepts in anatomy?		128	79	24	15	10	6
4 Can virtualization fully replace dissection ?		61	38	89	55	12	7
5 In which field of anatomy digitalization mere needed ?							
a. Gross anatomy		45	28	109	67	8	5
b. Embryology		111	69	45	28	6	4
c. Neuro-anatomy		123	76	36	22	3	2

Sugand *et al.*, 2010 proposed the recent evolution in anatomy curricula toward more computer-based instructions (5) raises the issue of the influence of dynamic computer visualizations and spatial abilities on this format of learning. With traditional static visualizations, students need to mentally manipulate three-dimensional (3D) relationships from what they see in two-dimensional (2D) representations (6).



### DISCUSSION

Researchers like azer (7) at University of Melbourne, sprunger (8) at Washington State University, Bregson *et al.* (9), at the University of New Mexico and in different countries evaluated the use of the real cadaveric specimens and the pure digital images to teach the anatomy to the undergraduate medical students and the residents. In these researches it was emphasized that the combination of dissection and the digital method of teaching the anatomy is more valuable (7) This study conforms with our results.

There has been little published research on the effectiveness of these three dimensional models. Lewis found only one study that had compared the efficacy of computer-assisted anatomy instruction with that of traditional teaching methods (12) Garg *et al* (13-15) conducted 3 randomized controlled trials on the efficacy 3D educational computer model of the carpal bones. They concluded that the “dynamic display of multiple orientations provided by computer based anatomy software may offer minimal advantage to some [ie, spatial] learners. The study raises question on type of learners (spatial abilities) may play important influence on results of 3D models teaching media.

Khalil (16) and Tan (17) reported that both the computer based two-dimensional pictures and three dimensional models play important roles in anatomy teaching for advanced learners. This offers promising future of use of technology in anatomy teaching.

Nowadays digital anatomy platform, composed by the Chinese digital human anatomy has been introduced as teaching system in the anatomy museum and the VH Dissector system is used at campus training sessions in university of Chinese. It has been based on sectional anatomy database of Chinese male and female bodies. (18)

Knowledge of human anatomy has been shown to be enhanced by supplementing traditional didactics with simulation.(19) While some might argue for replacing traditional cadaveric dissection courses on ethical grounds, there is currently insufficient evidence to support replacing anatomy education entirely with a simulation-based curriculum. (20) At the very

least, there is good evidence to support the inclusion of computer-assisted supplements. In one study of 238 1st year medical students access to virtual dissection tables in conjunction with cadaveric computed tomography scans yielded 27% higher scores test scores over the content.(21)

Philips *et al* in 2012 showed that simultaneous correlation of radiologic and cadaveric structures did not affect exam scores or student preference but helped students understand anatomical concepts in comparison with other course components. Most students thought that the 3D computer module was effective (60%), clear (66%), and user friendly (72%); most students (81%) thought that it was easier to understand laryngeal anatomy when they could visualize it in 3D; and most students (83%) said that they would like lectures better if they were supplemented with 3D computer modules. As per our study 93% students agreed for use of introduction of virtual dissection in medical curriculum, 86% students agreed that virtualization will make anatomy understandable. (22)

## CONCLUSION

The 21st century may see more traditional classroom didactics either supplemented or eventually replaced with virtual correlates. The widespread of adoption of digital media and virtual means of dissection is to become nearly universal only 50 years later is an example of how quickly an educational innovation can spread. Most recently virtual tools, computer-based cases are increasingly being used. Each can be dynamically programmed to adapt to provide feedback and meet learner-specific needs. As technology advances it would involve knowledge given as per need to specific target at specific time of medical curriculum. Integration of pre clinical courses with clinical ones and pre clinical training of clinical curriculum may provide answer in future. Study was not to prove dissection and traditional method as obsolete but to look at strength of modernization to tackle great number of individuals at shortest possible route in minimum required time. In an era of costly cadavers and its maintenance, virtualization may prove a path breaking mile stone in future development of curriculum.

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