Journal of Iranian Medical Council, Volume 9, Issue no. 1
http://dx.doi.org/10.18502/jimc.v9i1.20501

Letter to Editor



# Formalin in the Dissection Hall: A Fear Factor or a Catalyst for Teaching the Science of Anatomy

Mojtaba Esmaeli[1]* and Maryam Dehghanpour Dehabadi[2]

*1. Cellular and Molecular Research Center, Gerash University of Medical Sciences, Gerash, Iran*
*2. Dental Health Center, Larestan University of Medical Sciences, Shiraz, Iran*

## Dear Editor

Anatomy is considered as one of the most important educational branches in the medical curriculum, and one of the most crucial tools in the field of anatomical science education is the use of cadavers. While the use of cadavers can be highly effective for educational purposes, it also poses potential risks due to the presence of zoonotic diseases and wound infections, which can endanger the health of those in contact with them. One of the most common methods to minimize these risks and increase the preservation of cadavers for dissection is embalming or fixation of the cadaver (1).

Ideally, a variety of chemical compounds are used for the fixation of cadavers in a manner that can eliminate all organisms living inside and outside the body. However, these substances should not have harmful effects on the health of those working with the cadaver. Fixatives such as formaldehyde and glutaraldehyde are exemplary in their preservative properties (2). In addition to its crucial preservative properties, formaldehyde also poses a challenge in the dissection halls by contributing to anxiety and stress among medical students.

Formaldehyde ($CH_2O$) is a member of the aldehyde family. In the fixation of cadavers, formaldehyde, along with other solutions, is injected into the bodies through the femoral or internal carotid arteries. The formaldehyde vapors released during practical anatomy sessions increase the concentration of formaldehyde in the dissection halls, leading to greater exposure for medical students and instructors. Consequently, the inhalation of formaldehyde is intertwined with the teaching of anatomy using cadavers. The unavoidable inhalation of formaldehyde odor brings to mind cadavers and anatomy, potentially acting as a fear factor (3). The question arises whether the scent of formaldehyde can inadvertently steer the brain towards learning, or if inhaling this odor can prompt the brain to recall the classroom and lessons instead of the dissection room. This intriguing idea suggests that the association between the smell and the educational environment could potentially be leveraged to enhance the learning experience in anatomy.

Given these effects, the initial experience of students encountering a cadaver and inhaling the smell of formaldehyde for the first time, along with seeing other equipment and facilities in the dissection halls, is the

*** Corresponding author**
**Mojtaba Esmaeli, PhD**
Department of Anatomy, Gerash Faculty of Medical Sciences, Gerash, Iran
**Tel:** +98 9931953075
**Fax:** +98 9931953075
**Email:** dr.esmaeli1987@gmail.com

**Received:** 24 Dec 2024
**Accepted:** 15 Mar 2025

**Citation to this article**
Esmaeli M, Dehghanpour Dehabadi M. Formalin in the Dissection Hall: A Fear Factor or a Catalyst for Teaching the Science of Anatomy. *J Iran Med Counc.* 2026;9(1):271-72.

most significant barrier to their focus and learning in anatomy. Additionally, the young age of students and their emotional responses to these scenes can lead to anxiety, mental distress, and sleep disturbances after attending the first practical dissection classes (4). Therefore, it seems that prior exposure to all factors and equipment, except for the cadaver itself, can both reduce fear and anxiety in students and increase their confidence in attending practical dissection classes.

Implementing strategies like gradual exposure to dissection environments and familiarization with formaldehyde-like odors could mitigate these issues. This can be achieved by preparing the minds of anatomy students before reaching the dissection room by using images from anatomical atlases and showing educational dissection videos in the classroom. These resources help students familiarize themselves with the procedures and visual aspects of anatomy, making the experience less intimidating.

Additionally, after theoretical anatomy classes, the first experience of encountering a smell similar to formaldehyde, such as xylene, can be introduced by inviting students to histology labs without prior notice. This exposure can be repeated several times during the course before cadaver dissection, making the smell familiar to students. Gradual exposure to the smell helps students acclimate and reduces the initial shock associated with the dissection hall.

In the next step, students should be taken to the dissection hall and familiarized with the physical space, which should be prepared for their initial visit by being free of dissection tables, cadavers, and equipment. These visits should be conducted in several stages and spaced out over the term, even before the theoretical classes. In subsequent visits, other equipment should be gradually added to the dissection hall, and in the final stage, a covered cadaver should be brought in. Such simple measures can reduce students' fear, anxiety, and apprehension about being in the dissection hall, thereby enhancing their anatomical knowledge through increased confidence and focus.

By incorporating these strategies, educational institutions can create a more supportive and effective learning environment for medical students. Reducing fear and anxiety allows students to engage more fully with the material, leading to better learning outcomes and a deeper understanding of anatomical science.

### *Funding*

None declared.

## Conflict of Interest

There was no conflict of interest in this manuscript.

## References

1. Hayashi S, Naito M, Kawata S, Qu N, Hatayama N, Hirai S, et al. History and future of human cadaver preservation for surgical training: from formalin to saturated salt solution method. Anat Sci Int 2016 Jan;91(1):1-7.

2. Al Aiyan A, Barigye R, Mohamed ME, Menon P, Hammoud M, Richardson K. Microbial status of animal anatomical cadavers fixed using low formaldehyde concentrations. J Veter Anat 2018 Oct 1;11(2):1-6.

3. Brenner E. Human body preservation: old and new techniques. J Anat 2014;224:316-44.

4. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Acad Med 2006 Apr 1;81(4):354-73.