
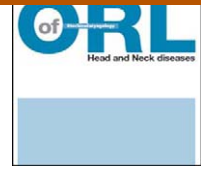




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ORIGINAL ARTICLE

First cadaver dissection: Stress, preparation, and emotional experience[☆]

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KEYWORDS

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Summary

Objective: To evaluate the psychological preparation and stress of medical students associated with their first cadaver dissection class, covering the head and neck region.

Materials and methods: Prospective evaluation of a group of 58 second-year medical students. **Results:** Participants experienced this first dissection class with little stress, with no significant gender difference. Men, however, felt better prepared than the women did. The smell and sight of the cadaver's face were their main concerns.

Discussion: The students were evaluated with STAI questionnaires and visual analog scales just before, immediately after, and one month after their first dissection experience. This is the first time this scheme has been used. Students suggested several improvements for advance preparation, most of them inexpensive in terms of human and material resources. The low stress caused by dissection is probably influenced by the fact that student participation is voluntary.

Conclusion: Although they felt that they were relatively unprepared from a psychological perspective, the vast majority of students felt ready to participate in the dissections and had a very good perception of this experience.

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Introduction

Although it has played a lesser role in recent years, the study of gross anatomy still dominates foundation courses and the first part of the medical core curriculum. While medical stu-

dents currently still receive a very complete technical and scientific education, their reactions to cadavers and death are topics that are not often addressed in formal anatomy and medical psychology courses.

The first contact with the dissection rooms is an unforgettable and important step in a young doctor's education. From generation to generation, the memory of the "amphitheater" has lingered through every doctor's career and was even long considered a mandatory and essential step, a rite of passage [1]. Although there have been numerous studies on the psychological impact of that initial gross anatomy work on medical students and their perception of that work, to our knowledge, none has focused on an

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evaluation by the students themselves of the pertinence or benefit of psychological preparation before their first gross anatomy lab sessions [2–7]. Finally, the way these labs are set up within the university means that the first dissection class covers the head and neck, areas that are especially emotionally charged.

The purpose of this study, conducted in students with no cadaver dissection experience, was to evaluate the stress experienced just before, immediately after, and several weeks after the dissection, and the pertinence of the psychological preparation they felt they had received before the first session.

Materials and methods

Enrollment in the dissection course is open to second-year medical students¹ each year at the University of Paris VI. Two annual sessions are held, each with a different group of students [8]. This study was conducted during the second session of 2010.

All participants were second-year medical students, 60 young adults who had never participated in a cadaver dissection. The advance preparation (about 30 minutes) consisted of a presentation of the history of anatomical research, a few dissection photos, safety instructions, and rules for handling instruments.

Three different evaluation sheets (Appendices A, B, and C) were provided to the students: the first after the introductory class (the day before the first session); the second after the first dissection (involving the head and neck); and the third when they defended their term papers, about a month after the dissections.

Each sheet contained demographic questions (sex, age), a State-Trait-Anxiety Inventory (STAI-A and B), a visual analog scale on stress (VAS_s), questions taken from the Fear of Death Scale, a visual analog scale on psychological preparation (VAS_{pp}), and several multiple choice and fill-in-the-blank questions about that preparation. Each sheet could be completed in less than 5 minutes. The third sheet was intended to determine each student's degree of stress in a non-anxiety provoking situation (baseline state). The VAS scales given to the students were not graduated but were calibrated from 0–10 (with decimals) after the fact for purposes of analysis.

The following data were compared: intensity of stress, perception of the preparation, and intensity of fears and actual reactions, based on sex and/or time of evaluation. The statistical analysis was performed with StatView[®] software and used Student's *t*-test and Fisher's exact test for comparisons.

Results

Nearly all students (58/60 enrolled, 97%) completed the three sheets. The median age was 19 years (18–23). There were 34 women (59%) and 24 men (41%).

Nearly 40% of the students ($n=23$; 39%) had never seen a human cadaver. Of the others, 18 (31%) had seen the corpse of a stranger and 22 (38%) had seen the body of a deceased relative (sum greater than 100% because seven had seen both a relative and a stranger). Significantly more men ($n=13$) than women ($n=6$) ($p=0.0074$) had previously seen the corpse of a stranger.

Tables 1 and 2 summarize the results.

Stress

Before any dissection, the mean STAI-A score was 30.3 ± 7.2 and the mean VAS_s was 2 ± 1.5 (Table 1). Only two students showed elevated stress on the VAS (≥ 6).

After the first dissection, the mean STAI-A score was 30.1 ± 8 and the mean VAS_s was 2.2 ± 1.6 . Only one participant had a score greater or equal to 6. It was the only score above the threshold for that student during the study.

Men tended to be somewhat more stressed after than before the dissection, but none of the differences (men/women or before/after) were significant.

Several weeks later, the students evaluated their stress at 35.6 ± 10.3 (low to very low level), with no difference between men and women. Eleven students, five men and six women, had a score greater or equal to 46 (moderate and high stress). Comparison with other students showed that these 11 students had a significantly higher post-dissection STAI-A score than their peers.

Psychological evaluation

The VAS_{pp} before any dissection was 4.5 ± 2.8 for both sexes combined. Men felt better prepared (5.6 ± 3) than women did (3.8 ± 2.4) ($p=0.0102$). Despite the apparently insufficient preparation, 55 students (95%) felt ready to handle the dissection.

After the first dissection, the VAS_{pp} was 4.7 ± 2.6 for both sexes combined. There too, men felt significantly better prepared (5.4 ± 2.9) than women did (4.1 ± 2.2) ($p=0.0346$). Comparison of the groups by STAI-B score showed that at the time the 11 most stressed students had felt less well prepared than their classmates. At the final examination, the VAS_{pp} was 4.3 ± 2.8 for both sexes combined. However, at that later time, the differences between men and women and students who were more or less stressed had evened out.

Reactions to dissection

Before any dissection, the main student concerns were the smell ($n=40$; 69%) and sight of the face ($n=25$; 43%), the sight and/or dissection of the subject's face ($n=8$), "beginner's" anxiety ($n=5$), the "sight of Death" ($n=2$), fear of passing out ($n=1$), or very clearly, nothing ($n=4$). No student indicated fear at the thought of touching a cadaver.

After the first dissection, the memorable events were the smell ($n=17$), the appearance of the face and eyes ($n=15$), the stiffness of the skin ($n=11$), and the "hole in the neck" ($n=1$). Even though they reported having been affected by one aspect or another, 27 students felt they had not been

¹ Medical school in France begins at entry into the university, in the first year of post-secondary studies.

Table 1 Results.

	All		Women		Men		Diff. M/W
	Mean (\pm SD)	Range	Mean (\pm SD)	Range	Mean (\pm SD)	Range	<i>p</i>
Before any dissection							
STAI-A score (/80)	30.3 \pm 7.2	20–57	31.5 \pm 7.9	20–57	28.6 \pm 6.2	20–45	0.0661
VAS _s (/10)	2 \pm 1.5	0–6.3	2.2 \pm 1.5	0.1–6.3	1.8 \pm 1.4	0.1–6	0.163
VAS _{pp} (/10)	4.5 \pm 2.8	0–10	3.8 \pm 2.4	0–8	5.6 \pm 3	0–10	0.0102
After first dissection							
STAI-A score (/80)	30.1 \pm 8	20–55	30.9 \pm 7.9	20–55	29.1 \pm 8.2	20–53	0.2047
VAS _s (/10)	2.2 \pm 1.6	0.1–7.3	2 \pm 1.4	0.1–6	2.2 \pm 1.8	0.2–7.3	0.3361
VAS _{pp} (/10)	4.7 \pm 2.6	0.3–10	4.1 \pm 2.2	0.3–8.3	5.4 \pm 2.9	0.3–10	0.0346
Pre-/post-dissection diff.							
<i>p</i> for STAI-A	0.4688		0.324		0.2174		
<i>p</i> for VAS _s	0.3819		0.255		0.1368		
<i>p</i> for VAS _{pp}	0.0959		0.3717		0.4934		
Later							
STAI-B score (/80)	35.6 \pm 10.3	21–64	35.8 \pm 10.7	21–64	35.2 \pm 10.2	22–63	0.4179
VAS _{pp} (/10)	4.3 \pm 2.8	0–10	3.8 \pm 2.5	0–9	5 \pm 3.1	0–10	0.0691

SD: standard deviation; diff.: difference; M/W: men/women; VAS_s: visual analog scale on stress; VAS_{pp}: visual analog scale on psychological preparation.

shocked or had been shocked “less than expected” by the dissection.

A month later, a majority of students (*n*=41, 70%) reported having thought about dissection. This occurred especially during the day (*n*=38), but also during meals (*n*=20), and even at night (*n*=7).

For them, the most memorable aspects were the smell of the cadavers (*n*=27), which one of the participants stated “followed [her] for days.” One student praised the “admirable generosity of the donors” and another “the human body, which is so well made.”

Most of the students (*n*=44) think that cadaver dissection was a positive experience. On the contrary, three participants reported distress from “unpleasant after-images” and a “disturbing experience.” Two of those participants were in the most stressed group of students.

Most students made no suggestions for potential improvements for their psychological preparation (no response: *n*=23; “nothing”: *n*=19).

However, two of them would have liked to have been informed beforehand about the state of the corpse, two others would have wanted to know more about the donation

procedure, one about how to handle the dissection instruments, and another would have liked to have seen some photos taken during previous sessions beforehand.

Discussion

Students experienced these initial “head and neck” cadaver dissections with moderate stress, with no significant gender difference. The men felt better prepared than the women did, but the vast majority of students felt ready to handle that first session.

The State-Trait-Anxiety Inventory, published in 1983, is one of the self-rating anxiety scales most commonly used in research and clinical practice [9]. It was translated into French and validated by Schweitzer in 1990 (STAI-Y) and comprises two scales: a state-anxiety scale (STAI-A) and a trait-anxiety scale (STAI-B). The STAI-A refers to what the subject is feeling “right now, at this very moment” and the STAI-B to what he “usually” feels. The total score varies from 20 to 80, and to facilitate its interpretation, the results are grouped into five levels: 1: very high stress (≥ 66); 2: high

Table 2 Distribution by stress groups according to STAI-A and B scores.

	Before any dissection		After first dissection		Later	
	STAI-A		STAI-A		STAI-B	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Group 1 (very high stress)	0	0	0	0	0	0
Group 2 (high stress)	1	1.7	0	0	2	3.4
Group 3 (moderate stress)	1	1.7	4	6.9	9	15.5
Group 4 (low stress)	9	15.5	7	12.1	12	20.7
Group 5 (very low stress)	45	77.6	45	77.6	35	60.3

stress (56 to 65); 3: moderate stress (46 to 55); 4: low stress (36 to 45); 5: very low stress (≤ 35). The STAI-Y has obvious positive qualities: brevity – short and clearly defined items that are easy to quantify based on their intensity or frequency – and sensitivity to change. The two parts relative to state-anxiety and trait-anxiety can be used independently, depending on the goals of the study, and that is what we did here [10].

The Fear of Death Scale was developed by Collett in 1969 and updated by Lester in 2004 [11,12]. This scale has been used in many studies but was inappropriate here, since it consists of 30–50 long questions. Therefore, only a few of the most pertinent questions were added to the evaluation sheets. Our goal was not to evaluate the students psychologically but to get an overall idea of their perceptions.

VAS scales are used in routine practice to assess pain and stress, particularly in occupational settings [13,14]. Although not previously used for this purpose, the VAS seemed pertinent for assessing psychological preparation in this study. It was noteworthy that while a value of '0' was used several times on the VAS_{pp}, it was never used on the VAS_s.

This study did not find any significant difference in stress in the students before or after the first dissection. This outcome contradicts most prior studies. For example, in 2004, Arraez-Aybar et al. found a significant decrease in stress, abating from session to session [15]. Likewise, in 1997, Dickinson and Abu-Hijleh found a difference in stress between their male and female students, with the women significantly more tense than their male peers [2,5]. Several factors may explain the differences found here. Firstly, the evaluation scales used and their sequence of administration, albeit similar, have never been strictly the same in the various studies, which makes comparisons difficult. To our knowledge, the sequence used in this study (immediately before, immediately after, and one month after the first dissection) had never before been used. The optional and voluntary nature of participation in such dissections is probably also a factor that influences the outcome. The students most anxious at the idea of participating in a gross anatomy lab would have chosen a different course. The population in the sample presented here is smaller than in most reported series [2,5,6,15–17]. Finally, the VAS_s provided little information during this study and had a low correlation with STAI scores. Its pertinence in this context and to the study population is therefore weak.

Several prior studies found that progressive psychological preparation decreased student anxiety. In 2004, Arraez-Aybar et al. compared the perceptions of two groups of students, one of which had visited the dissection rooms before the cadavers were brought in and had viewed dissection films. The students in the prepared group were significantly less anxious [15]. Tschernig et al. reported similar results in 2000: 72% of students interviewed found it "very helpful" to spend 30 minutes in the company of an instructor prior to the dissection. The purpose of the interview was to allow them to express their anxiety [18]. Mentoring by third-year or older students was also evaluated, with good results. For example, Houwink et al. reported that first-year students had a better perception of their first dissection with the assistance of more advanced students than did their predecessors who had not received

such mentoring. The main bias of that study is that it evaluated the perceptions of one of the two groups of students one year later [19].

The medical students who participated in our study globally felt they had been unprepared for the dissections. However, nearly all (95%) felt they were already ready or had been sufficiently prepared and tolerated the experience very well. One probable source of bias again comes from the fact that all had volunteered for that course.

If those initial dissections were so well tolerated, why then seek to improve the preparation? We do so first because students are calling for additional information. Cadaver dissection is a memorable experience that affects them and stimulates their curiosity [1]. Secondly, even if these labs are well perceived overall, they are quite taxing for some participants, both immediately after the dissection and several weeks later. Those students would probably benefit from somewhat more suitable initial training.

The suggestions made by the students themselves are applicable: information about the donation procedure, details about the names of instruments and rules for handling them, presentation beforehand of photographs or videos, mentoring by older students who had previously participated in dissections, and finally starting the sessions with a less disturbing region than the head. These suggestions have the advantage of being very inexpensive from the perspective of human and financial resources, at a time when departmental budgets are often being reduced and where anatomy is a low priority subject. Simply providing additional information during the introductory class could undoubtedly improve the experience of all students, and particularly those who experience significant stress.

Finally, fear of the smell of the corpse and of the sight of the face is a constant in the literature and always the primary concern of students [2,3,5,18,20,21]. This held true in the present study, immediately before and after, as well as several weeks after the cadaver dissection.

Conclusion

This study found globally low stress in second-year medical students during cadaver dissection. While they felt they were relatively unprepared from an emotional and psychological perspective, the vast majority felt ready to participate in the gross anatomy labs and had a very good perception of this experience. The students' voluntary participation in this course probably influenced these results.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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Appendix A. Pre-dissection questionnaire

Initials: |

Your age: You are: a female – a male

Some phrases that we used to describe ourselves are given below. Read each phrase, then check the box that best reflects what you are feeling **RIGHT NOW, AT THIS VERY MOMENT**.

There are no right or wrong answers.

Do not spend too much time on any of these items and indicate the answer that best reflects your current feelings.

	No	Somewhat no	Somewhat yes	Yes
1. I feel calm				
2. I feel safe, secure				
3. I feel tense, nervous				
4. I feel stressed				
5. I feel peaceful, good about myself				
6. I feel upset, overwhelmed				
7. I worry over possible misfortunes				
8. I feel happy				
9. I feel frightened				
10. I feel at ease				
11. I feel self-confident				
12. I feel nervous, irritable				
13. I feel scared, alarmed, afraid				
14. I feel uncertain				
15. I am relaxed, at ease				
16. I am satisfied				
17. I am anxious, worried				
18. I feel disconcerted, disoriented				
19. I feel collected, composed				
20. I feel pleasant, in a good mood				

Do you feel nervous? Place a vertical mark

No stress *Maximum stress*

What do you fear the most?

Beforehand, how well do you think you have been psychologically prepared? Place a vertical mark

Not at all *Completely*

Overall, do you feel emotionally ready to go into the dissection room?

Yes or No

Have you ever seen a cadaver?

No	Yes, a stranger	Yes, a relative
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Table 2 What feelings does the thought of dissection arouse in you? (check or circle).

Anxiety	Breathlessness	Calmness	Curiosity
Distaste	Disgust	Dizziness	Dry mouth
Fear	Joy	Horror	Interest
Nausea	Nervousness	Palpitations	Pleasure
Queasiness	Revulsion	Satisfaction	Tremor
Uncertainty	Anger	Worry	Other:

Table 2 What do you think is most unpleasant in the dissection room? (check or circle).

No problem	The smell
Fear of infection	Seeing the subject's face
Touching the subject	Other:

Appendix B. Immediate post-dissection questionnaire

Initials: |

Your age: You are: a female – a male

Some phrases that we used to describe ourselves are given below. Read each phrase, then check the box that best reflects what you are feeling **RIGHT NOW, AT THIS VERY MOMENT**.

There are no right or wrong answers.

Do not spend too much time on any of these items and indicate the answer that best reflects your current feelings.

	No	Somewhat no	Somewhat yes	Yes
1. I feel calm				
2. I feel safe, secure				
3. I feel tense, nervous				
4. I feel stressed				
5. I feel peaceful, good about myself				
6. I feel upset, overwhelmed				
7. I worry over possible misfortunes				
8. I feel happy				
9. I feel frightened				
10. I feel at ease				
11. I feel self-confident				
12. I feel nervous, irritable				
13. I feel scared, alarmed, afraid				
14. I feel uncertain				
15. I am relaxed, at ease				
16. I am satisfied				
17. I am anxious, worried				
18. I feel disconcerted, disoriented				
19. I feel collected, composed				
20. I feel pleasant, in a good mood				

Do you feel nervous? Place a vertical mark

No stress Maximum stress

Table 2 Did you joke or find yourself in a funny or amusing situation during the dissection or in connection with the cadaver? (check or circle).

No, that did not happen	I took part in it
Yes, but I was opposed to it	I felt ill-at-ease when the others did it
Yes, but it was unimportant	Other:

What have you found to be the most memorable?.....

 Were you shocked by anything?.....

After the fact, how well do you think you were psychologically prepared? Place a vertical mark

Not at all Completely

In your opinion, what is a cadaver? (one response only)

An inanimate object A person, someone who was alive

- Did you have serious thoughts about life and death in the dissection room?
Yes or No
- Were you afraid of losing control in the dissection room? (leaving the room, feeling sick, crying, etc.)
Yes or No
- Did you have trouble concentrating on your work in the dissection room?
Yes or No
- Did you or your group name the cadaver?
Yes or No
- If so, what?.....

Appendix C. Late post-dissection questionnaire

Initials: |

Your age: You are: a female – a male

Some phrases that we used to describe ourselves are given below. Read each phrase, then check the box that best reflects what you feel **IN GENERAL**.

There are no right or wrong answers.

Do not spend too much time on any of these items and indicate the answer that best reflects your current feelings. NoSomewhat noSomewhat yesYes1. I feel pleasant, in a good mood2. I feel nervous, restless3. I feel happy with myself4. I wish I were as happy as other people5. I feel like a failure6. I feel rested7. I keep my head about me8. I feel like problems are piling up to such an extent that I can no longer overcome them9. I worry about things that have no importance10. I am a happy11. I have thoughts that disturb me12. I lack self-confidence13. I feel carefree, secure14. I make decisions easily15. I feel incompetent, not up to the task16. I am satisfied17. Unimportant thoughts run through my head and bother me18. I take disappointments so much to heart that I do not forget them easily19. I am a collected, composed, stable person20. I become tense when I think about my problems

After the fact, how well do you think you were psychologically prepared? Place a vertical mark

Not at all Completely

Have you had thoughts about dissection several days after the end of the sessions?

yes or no

If so,

During the day?	At mealtimes?	In the evening or at night?
yes/no	yes/no	yes/no

If you smoke, do you think your smoking patterns have changed since the dissections?

yes or no or not applicable

If so, increase? yes or no

Decreased? yes or no

What have you found to be the most memorable, the most shocking?

Is there something you would have liked to have addressed before any dissection?

Overall, how have you reacted to this course?

References

- [1] Godeau E. *L'esprit de corps*. Paris: Maison des Sciences de l'Homme; 2007 [300 pages].
- [2] Abu-Hijleh MF, Hamdi NA, Moqattash ST, et al. Attitudes and reactions of Arab medical students to the dissecting room. *Clin Anat* 1997;10:272–8.
- [3] Arraez-Aybar LA, Castano-Collado G, Casado-Morales MI. Dissection as a modulator of emotional attitudes and reactions of future health professionals. *Med Educ* 2008;42:563–71.
- [4] Bonnaud-Antignac A, Armstrong O, Hamel A, et al. Le vécu des dissections au laboratoire d'anatomie. Conséquences psychologiques et actions pédagogiques. *Ped Med* 2008;9:201–8.
- [5] Dickinson GE, Lancaster CJ, Winfield IC, et al. Detached concern and death anxiety of first-year medical students: before and after the gross anatomy course. *Clin Anat* 1997;10:201–7.
- [6] Horne DJ, Tiller JW, Eizenberg N, et al. Reactions of first-year medical students to their initial encounter with a cadaver in the dissecting room. *Acad Med* 1990;65:645–6.
- [7] O'Carroll RE, Whiten S, Jackson D, et al. Assessing the emotional impact of cadaver dissection on medical students. *Med Educ* 2002;36:550–4.
- [8] FMPMC. UE PCEM2. 2010; http://www.chusa.jussieu.fr/enseignement/master/P2-S1_Dissection_modalites.pdf.
- [9] Spielberg S. *Manual for the State-Trait-Anxiety Inventory*. Palo Alto: Consulting Psychologists Press; 1983 [16 pages].
- [10] Bruchon-Schweitzer M, Paulhan I. *Manuel pour l'inventaire d'anxiété Trait-État (forme Y)*. Paris: ECPA; 1990 [19 pages].
- [11] Collett LJ, Lester D. The fear of death and the fear of dying. *J Psychol* 1969;72:179–81.
- [12] Lester D. The factorial structure of the revised Collett-Lester Fear of Death Scale. *Death Stud* 2004;28:795–8.
- [13] Chamoux A, Borel AM, Petit G, et al. Objectivisation du stress professionnel par la fréquence cardiaque. *Rev Med Trav* 1991;18:277–80.
- [14] Lesage FX, Chamoux A. Utilisation de l'échelle visuelle analogique (EVA) dans l'évaluation du stress au travail: limites et perspectives. *Revue de la littérature. Arch Mal Prof Env* 2008;69:667–71.
- [15] Arraez-Aybar LA, Casado-Morales MI, Castano-Collado G. Anxiety and dissection of the human cadaver: an unsolvable relationship? *Anat Rec B New Anat* 2004;279:16–23.
- [16] Cahill KC, Ettarh RR. Attitudes to anatomy dissection in an Irish medical school. *Clin Anat* 2009;22:386–91.
- [17] Kawashiro Y, Anahara R, Kohno T, et al. Attitudes of healthcare students on gross anatomy laboratory sessions. *Anat Sci Educ* 2009;2:273–9.
- [18] Tschernig T, Schlaud M, Pabst R. Emotional reactions of medical students to dissecting human bodies: a conceptual approach and its evaluation. *Anat Rec* 2000;261:11–3.
- [19] Houwink AP, Kurup AN, Kollars JP, et al. Help of third-year medical students decreases first-year medical students' negative psychological reactions on the first day of gross anatomy dissection. *Clin Anat* 2004;17:328–33.
- [20] Schwartz CE, Downie SA, Fornari AB, et al. Impact of cadaver dissection: working toward solutions. *Anat Sci Educ* 2008;1:269.
- [21] Lee-Tsang-Tan G, Kent G. Emotional reactions during medical education. *Acad Med* 1995;70:343–4.