

The Practice of Cramming

by Lusia Et Al

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The Practice of Cramming among Pre-Clinical Medical Students and Their Remedial Examination Result: A Simple Preliminary Demographic Analysis

Lusia Sri Sunarti,¹ Yusias Hikmat Diani,² Muhammad Alfarabi,³ Jap mai Cing,³ Evy Suryani Arodes,¹ Linggom Kurniaty,⁴ Forman Erwin Siagian,⁵ Alifa Hasna⁶

¹ Dept of Microbiology, ² Dept. of Community Medicine, ³ Dept. of Biochemistry and the Center of Biomedic research, ⁴ Dept of Pharmacology and Therapeutic, ⁵Dept. of Parasitology and the Center of Biomedic research, ⁶ Pre-clinical student, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia

Email: forman.siagian@uki.ac.id

Abstract

Introduction: Cramming among University students is a common practice, and this caused by combination of autonomy in learning, stacked learning materials, procrastination, short/limited time allocation in academic calendar, and a line of non-academic social activities that take up a lot of student's leisure time. Like a tip of an iceberg, this practice can be felt, even though not clearly seen and the possibility that the culprit will deny it if asked openly. It is still being debated about its advantages nor disadvantages, but it can cause health and mental effects to the perpetrator. Variations in practice of cramming can occur depending on the subject, institution, seniority and even gender and place of residence. The aim of this simple study is to analyse the practice of cramming among pre-clinical medical students and their remedial examination result based on their gender and place of residence, along with a review of the literature on the factors that foster this practice. **Methods:** This a simple, cross sectional study analyzed personal demographic data (gender and place of residence) of students taking remedial exams and combined it with the result of those exams. **Results and dicussion:** Data of 2413 students who took a total of 36 computer-based theoretical and or practical/lab remedial exams. 739 (30.62%) were male and 1674 (69.37%) were female, and of that number, students who live in boarding houses as many as 1054 (43.68%) and 1359 (56.31%) live in their own private house. The practice of cramming conducted by 1553 students (64.35%) consisting of 505 male (32.51%) and 1049 female (67.54%). Based on the total number of participants taking the remedial exam, the prevalence of cramming was slightly higher in male student (68.33%) compared to female student (62.66%). Based on their place of residence, most of the perpetrator live in their own house (n=935 or 60.20%) and 39.80% live in boarding houses (n=619). Statistic analysis using Pearson chi-square on the gender differences and place of residence in cramming behavior both were proved significant ($p=0.007$ and $p=0.000$).

Conclusion: The pravelence of cramming in this study was 64.35% and performed by both gender. There were statistically significant differences (by gender and place of residence) in cramming behavior. Further qualitative study need to be conducted to search for personal motives that drive the behavior.

Keywords: autonomous learning, procrastination, health, mental, computer based exams, male, female, place of residence, substance abuse

Introduction

Cramming per definition is an act to try to learn every examination related materials in a shortest time allocation that usually conducted due to previous intended procrastination, e.g., due to internet addiction; cramming usually conducted just the night before the exam.^{1,2} Theoretically, postpone of studying until the night before an exam actually can fill a student's brain with a huge amount of information which was actually short-term memory.^{3,4} In order to master it, the perpetrator must actually compel his/her brain to selectively⁵ and purposely choose which material to study in relation to the allocation of study time⁶; and by getting used to doing that, the perpetrators may feel very satisfied and increasingly shrewd, especially if the material they choose turns out to be the material being tested.¹ The right choose make wise decisions for survival and this sound like a gamble. When a student gets a good grade through cramming, he/she might potentially feel that rush of relief associated with getting away with something.^{1,7}

The daily life of a university student, especially those from medical faculty, demands a lot; academically and socially.⁸ For new students, the transition from the learning style of secondary education to the autonomous model of higher education is also a confounding factor, if adaptation to those changes is slow to occur.⁹

In the context of medical faculty, the typical faculty of medicine focuses on a mixed of traditional class based lectures and integrated problem-based learning modules in delivering medical education that combined basic medical sciences and with skill's related clinical knowledge.¹⁰ On the other hand, student's social non-academic activity also very demanding.¹¹ Too much to do but too little time available.

Procrastination and cramming- is completely common practice and widely justifiable among students and yet perhaps officially denied by their institution.¹² Along with this practice, especially in the long term, will caused sleep deprivation,¹³ blood pressure disorders,¹⁴ physical-mental-emotional disruption¹⁵ and also substance abuse,¹⁶ e.g., tobacco or caffeine, in order to accomplish good marks and passing the exam.¹

In general, there are two types of exams in medical faculty, the regular one and the remedial.¹⁰ Regular exams are set of tests (theory and lab work) to measure students' academic abilities that are tested immediately after the learning process ends. When medical student got fail in any subject of those tests, he/she have to take a remedial exam to successfully clearly pass that subject in those semester in order to avoid having to repeat the entire subject in the following year. Most remedial exam takers are not the brightest students in class and often take more than one remedial exam subject at nearly the same time. There are allegations that students who prefer to do cramming do not just do it on one, but on many exams; so it seems to have become like a habit. There is also a possibility that the participants will become overconfident because they suspect that the exam questions will be repeated;¹⁷ even though the exam questions that are tested are always new questions that have never been tested on regular exam.

Because of the uniqueness of the remedial exam model, this research is aimed at knowing the demographic background (gender and place of residence) of medical students who practice of cramming in taking remedial exams and a simple review of the literature on possible rationalizations that foster this practice. To our knowledge, data regarding cramming among medical students is lacking and sparse, especially in the remedial exam.

Materials and Methods

This simple cross-sectional study observed the two demographics data available, e.g., gender and place of residence, which is regularly asked whenever students filled in their identity prior to computer based exam, comparing cramming and non-cramming students, based on the results of the remedial exam scores for courses/block in the second, fourth, and sixth semesters of the Faculty of Medicine, Universitas Kristen Indonesia, Jakarta-Indonesia, which has been carried out throughout August 2022. This whole study (from planning, data collection, data analysis and written the manuscript) was conducted throughout August-September 2022.

List of Question in the pre-exam electronic questionnaire

Demographic

1. Gender (Male/Female)
 2. Place of Residence (Own house/ Boarding house)
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The inclusion criteria in this study were active students who fill their demographic data completely and had remedial scores for each component of the course and if students do not have any of the relevant data (demography, cramming and grades) they will be excluded from the study. All data initially made available in Microsoft Excel™ and then further classified and processed using SPSS™.

Other sensitive data related to students 's personal information will not be displayed in order to maintain ethical values as well as to remain relevant to the research objectives.

Result and Discussion

During data collection, 2413 students who took a total of 36 computer-based theoretical, and or practical/lab remedial, and or clinical skills exams were eligible to join the study. This remedial exam conducted after all the regular exams were carried out and the results are announced to students. For those who have not reached the lower pass threshold score (minimum 65) are required to take a remedial exam which is conducted only once for one subject.

The remedial exams in our faculty have been arranged in such a way that no two or more exams are conducted at the same time and it is expected that students will only take one remedial exam in one day so he/she can have sufficient time to prepare for the coming exam and to prevent students from the potency of cramming.

Demographically, 739 (30.6%) were male and 1674 (69.4%) were female. The gender ratio of our respondents generally represents the gender ratio of students in our institutions and also seems to be a general picture of a typical global medical school where the number of male students is less than female students (estimated ratio M:F=1:2+). Based on the place of residence, number of students living in boarding houses is 1055 (43.7%) and 1359 students (56.3%) live in their own private house. All data presented in table 1.

Overall, the practice of cramming conducted by 1554 students (64.4%) who took the remedial exams which consisted of 505 male (32.51%) and 1048 female students (67.43% of all perpetrators of cramming). However, when compared with the total number in each group (male and female students) in the form of a ratio (cramming male : total male students and

cramming female : total female students), the ratio of male students who are cramming is 0.68 and those who are women are slightly lower at 0.62.

Table 1. Demographic and characteristics of the respondents

Demographic		n (%)
Gender	Male	739 (30.6%)
	Female	1675 (69.4%)
Place of Residence	Boarding houses	1055 (43.7%)
	Private houses	1359 (56.3%)
The Practice of Cramming		n (%)
Did you cramming for this exam *Failed the exam if score achieved <65 and Pass the exam if score ≥65	Not Cramming	860 (35.6%)
	Male	234 (27.20%)
	Failed; mean score	135/234(57.69%);48.05
	Pass; mean score	99/234 (42.3%); 76.55
	Female	626 (72.79%)
	Failed; mean score	338/626(53.99%);50.44
	Pass; mean score	288/626 (46%); 76.23
	Yes, Cramming	1554 (64.4%)
	Male	505 (32.51%)
	Failed; mean score	302/505(59.80%);49.81
	Pass; mean score	203/505(40.19%);75.32
	Female	1048 (67.43%)
	Failed; mean score	809/1048(77.19%);50.3
	Pass; mean score	239/1048(22.8%);75.66
ratio of cramming perpetrators to the total population by gender		ratio
Ratio	Not Cramming	
	Male : total male	0.31
	Female : total female	0.37
	Cramming	
	Male : total male	0.68
	Female: total female	0.62
Cramming based on place of residence and gender		n (%)
Place of residence	Boarding houses	
	Male (n total=248)	168 (67.74)
	Female (n total=806)	451 (55.95)
	Own house	
	Male (n total=491)	337 (68.63)
	Female (n total=868)	598 (68.89)

Our data reveal that there are more male students conduct cramming (as many as 505 students of a total of 739 male students or 68.33%) than female students (as many as 1048 students of a total of 1675 female students or 62.56%) or in ratio 0.68 vs 0.62. Statistic analysis using Pearson Chi-square conducted in order to compare mean scores on each gender to identify any differences regarding cramming ($p=0.007$). The findings revealed that there is a difference between male and female students in the choice of cramming, where more male students do cramming.

The interesting phenomenon in the context of non-cramming students are as follows: (1) the percentage of female students who passed the exam (score > 65) was slightly higher than that of male students (46% vs 42.3%) and (2) in the group of female students who failed to reach the threshold score of 65 actually got a higher score on average than the group of male students (50.44 vs 48.05).

This phenomenon is interesting to be explored more deeply in future research. We hypothesize that there is specific gender related internal factors, *e.g.*, hormonal or psycho-emotional, that play a role in the choice of cramming.

To some extent, science often considered more acceptable to men than women,¹⁸ even though no clear evidence of statistically significant differences found on previous scientific articles regarding cramming. Medical science in general tends to be considered a difficult subject by all learners, but men and women study it slightly differently,¹⁹ including on how they organize their armamentarium, *e.g.*, look for chances to make simple memory works, pointing crucial parts in their reading material, structure their method of study and even perhaps rewrite keywords so as to direct better understand the topic; or in other words try to use every sources they have efficiently. Women actually are better at multitasking than

men.²⁰

Different genders showed a distinct finding in terms of risk-taking attitude.^{21,22} Studies suggested that male and female adolescent respond differently to conditions that require them to take any risk.^{23,24} Male adolescents were reported as being riskier as compared to female adolescents.²³ The risk-taking attitude among adolescents had exposed adolescent to various negative implications such as cramming.¹ Further consideration of psychological and emotional characteristics regarding each gender, males are plausible to utilize more life threatening risk-taking activities as differentiated to their female counterparts and usually it works.²⁵ It is males with high risk-taking attitude were less socially anxious and less sensitive to the negative outcomes, *e.g.*, failing the exam, compared to female adolescents.²⁴ And in our study, it seems that our findings support that previous statement. Male that conducted cramming were more successful than female students, as evidenced by a higher percentage of passing the remedial exam (M:F=40.19%:22.8%, $p=0.928$).

It seems that Male adolescent seemingly involved in risk-taking due to the nature of the attitude being socially acceptable; and the more it is done, the perpetrator will be more tolerant of risk as his brain rationalizes it.²⁶ on contrary, Women are perceived to be more risk averse; their feminine aura directs them to be more attentive in taking risks and avoid them, especially when they find the risks outweigh the benefits, or even would have adverse effects on themselves.²⁷ Actually, adolescents are vulnerable towards risky situations despite the mixed findings of risk-taking attitude in between genders.²⁸ specifically, more indepth study need to be conducted to reveal any specific gender related factors associated with the act of cramming.

In case of Place of residence, the study result revealed that statistically, there is a significant differences between students who live in their own house conducted more cramming than students who live in the boarding houses ($p=0.000$).

we assume that those who live in boarding houses alone, away from home and parental supervision, are required to be more responsible and organized. It is possible for those with limited sources of financing, to be forced to choose a boarding house with minimal facilities (for example, no wifi). Therefore, boarding house based students will tend to be required to be more creative, have a countable supporting network and have their own coping mechanisms to make up for these deficiencies. Whether living in dormitory or boarding house, as long as students live alone apart from their families at home, this condition remains a challenge. Study conducted by Karnina²⁹ revealed there was no correlation between cumulative GPA in students living in both types on non own house.²⁹

But on the contrary, for those who live at home alone, it seems more tempting. Usually the house has facilities that add to the comfort of the occupants and make it easier for modern human activities which sometimes diverts the focus of attention (for example, because it is so comfortable, student become lazy to study and continue to play online). Not to mention that the distance from home to campus is very far so that the journey must be taken in a long time with various difficulties such as severe traffic jams, changing modes of transportation, etc, which can make students tired even before the lesson starts and this actually adds to the complexity of the problem. It will be interesting to explore into these things in more depth, especially in relation to procrastination which ultimately leads to cramming. We can see further analysis of this statement on figure 1.

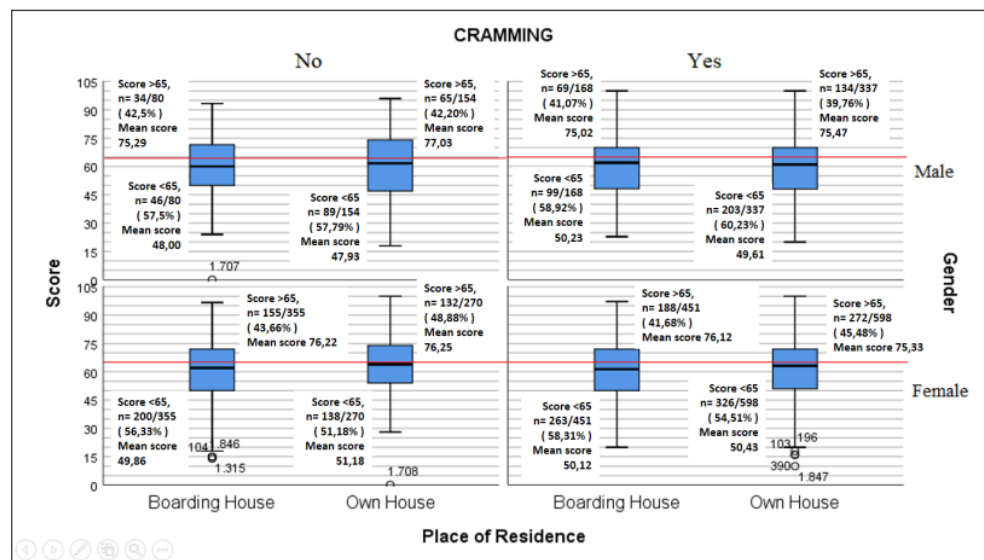


Fig 1. Box plot diagram of Cramming perpetrator based on combination of gender and place of residence. Upper left quadrant: non-cramming male student, upper right quadrant: cramming male student, lower left quadrant: non-cramming female student, lower right quadrant: cramming female student. In all quadrant, the data is presented further by dividing into two categories of residence. The red line shows the lower threshold of the passing score, which is 65.

Further analysis of exam result/score conducted by grouping based on the gender which is then further divided by their place of residence. Out of the 80 non cramming male students living in boarding houses, 34 (42.5%) got a score > 65 with an average score of 75.29; whereas of the 154 male students living in their own houses, 65 students (42.20%) got a score > 65 with an average score of 77.03. While in the sub group of cramming male students living in their own home (n=337) the result is as follows: only 39.76% pass the exam with lower mean score 75.47 (compared to the non cramming male living in own house) whereas of the 168 male students living in boarding house, the percentage of passing the remedial exam is 41.07% with mean score 75.02. The percentage of failure in the group of male students was slightly higher for those who did cramming, both living in boarding houses and their own homes, compared to students who prepared better and not conducting cramming.

The data on the non-cramming group of women are as follows: those who lived in the boarding houses as many as 355 (in total) and out of 355, it turns out that only 155 (43.66%) successfully pass the exam with mean score 76.22. While in the sub group of non cramming female students living in their own home (n=270) the result is only 48.88% pass the exam with mean score 76.25. On the contrary, for those cramming female students that live in boarding house the percentage of passing the exam is only 41.68% and those who live in their own house only pass as much as 45.48% with mean score 75.33. The same phenomenon of failing the remedial exam also occurred in the group of female students; the percentage of those who fail is higher than those who pass.

Our findings show that cramming is not always negative in terms of the fact that the method can still make the perpetrator reach the pass threshold. Cramming itself as a learning entity still deserves to be reckoned with, at least for short-term success, although its overall effectiveness in the long term remains doubtful.¹

To our understanding, that cramming behavior is part of the search for identity-youth seek autonomy in adolescents who are growing up and then their self-actualization.³⁰ Cramming will not be practiced continuously. As the perpetrators get older and become more open minded, awareness of self-esteem in combination with common moral values regarding hard work and struggle will arise, subconsciously.³¹ This emotional maturity stage will make the practice cramming is no longer relevant to be practice in addressing daily life situation that requires maturity, planning and resilience.³² By building step by step resilience through everyday experience and combining it with academic self-concept, it seems that significant college adjustment slowly develop the student's confidence.

To our knowledge, even though the practice of cramming is carried out in many places, scientific publications regarding this are still limited, especially electronically. There is a sort of academic taboo that stands in the way of exploring this practice. So it is quite difficult to compare our findings with references from elsewhere.

Further analysis regarding gender and place of residence among cramming perpetrator was conducted based on the year level (1st, 2nd or 3rd year). It is interesting to further explore whether there are differences in the trend of change of behavior as students become more senior/higher in their level of education; the data analyzed is presented in the form of a line graph.

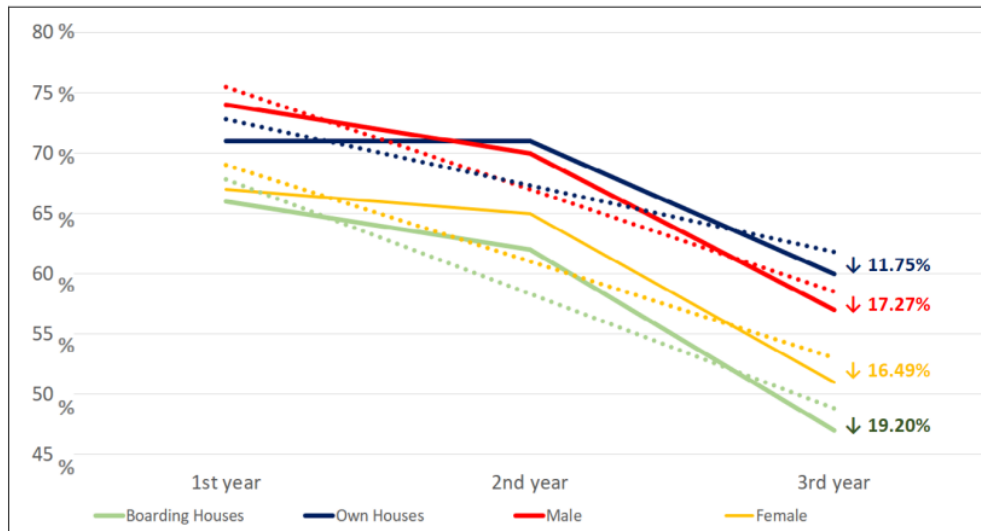


Fig 2. Reduced trend of cramming as indicated by the decreasing percentage (among male-female and living in own house-boarding house) based on the year level (1st, 2nd and 3rd year students). the straight line connects the percentage of the number of cramming incidents in first-second-third year students, while the dotted line shows the decreasing trendline or pattern that occurs in all variables (gender and place of residence)

The data in Figure 2 reveals a pattern of decreasing incidents of cramming in all variables (male-female and own house-boarding house) as the level of education increases. Among the first year students (male-female and living in own house-boarding house) the percentage of cramming were all above 65%, and slowly began to fall in sophomores, although the decline has not drastically seen compared to the percentage of third year students (in general less than 60%). It is very interesting to analyze this phenomenon further.

Our assumption is that the prevalence of cramming which is still high among first-year students is because they have not been able to immediately adapt to the way of learning in university/higher education. Traditional methods and patterns of learning as practiced in high school are still carried away, not to mention the unpreparedness in adapting to academic and social life on campus. Social events such as music, sports, travelling or outbond activity is not carried out during academic hours, but it is usually carried out in the evenings after the last class finished or on weekend holidays. Also of course, such activities also drain energy and take up time that could actually be used for rest.

In addition, the limitations of effective learning deadlines that apply while campus social life is also being intensively targeting new students.¹ For the freshmen, the effort to be accepted in a new place as soon as possible is through active participation in social events on

campus, especially those involving many seniors These things become a series of events that trigger procrastination.^{33,34}

Regarding the trendline, based on the variables of gender and place of residence, the steepest downward trend occurred in the group of students living in boarding houses, where there was a decrease of 19.2%. Meanwhile, the sloping decline occurred in the group of students who stayed at their own home, which was only reduced 11.75%. When compared between gender variables, the reduction in cramming practices was greater in the male group (17.27%) than in the female group (16.49%).

The trendline that shows this downward pattern indicates several things, namely:

- 1) even though at the beginning of education the percentage of cramming is high, but over time the student's perspective are widely open. So as they become seniors, students' insights become more positive, and they seem to understand more about their duties and responsibilities;
- 2) along with the learning model in medicine which actually is like an inverted pyramid, where the higher the level of education, the more complex the material being studied, so that the "cramming based" learning model is no longer relevant in sophisticated exams that integrates more subjects, e.g., involving Anatomy, Histology, Physiology, Pathology, Parasitology, Microbiology, Internal Medicine, Obstetry and Gynecology *etc* all at once, at the senior level and the decreasing practice of cramming when students reach higher levels of education justified point no. 2;
- 3) or maybe the reason is as simple as the failure of cramming in the previous exams so that it makes the perpetrator failed to pass a subject and followed by their conversion and no longer wants to conduct cramming in the next exams.

The reasons mentioned above are indeed very interesting, although they must be scientifically proven through further study. These data does not necessarily represent all of our students and/or even medical students elsewhere because it must be remembered that these are the results of all our remedial exams, which of course suggests that the students may not be the most outstanding academic achievements.

The participants had already failed the previous regular exam so they might feel they already know what type of the questions being tested will be like and then unfortunately they take them for granted and choose to conduct cramming. Although this satire allegation must be proven further through more in-depth study regarding personal motives that drive the behaviour (cramming).

The results of this study should open insights for all stake holder in the field of medical education, and it must be clearly said that all of these findings do not necessarily represent all of our students, let alone students of medical faculties elsewhere.

Conclusion

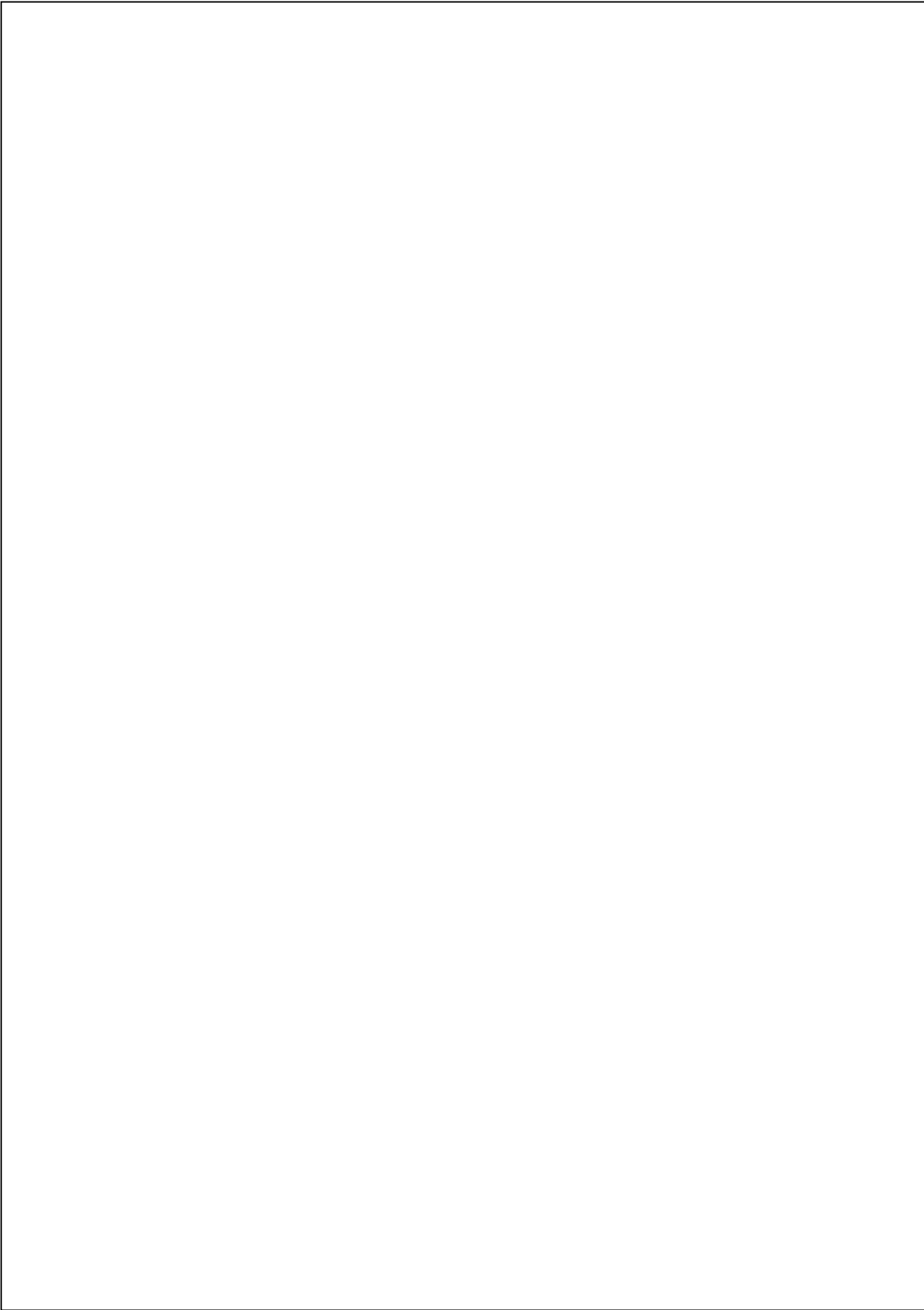
The prevalence of cramming in this study was 64.35% and performed by both gender. As a percentage, slightly more male students do cramming than female students. Regarding place of residence, the percentage of cramming found more in the sub group of female students who lived in their own house. As students move up to a higher level, the practice of cramming is increasingly being abandoned.

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