

Millenium, 2(17), 61-71.


en

UMA ALTERNATIVA NA GESTÃO DA MENSTRUÇÃO: UM ESTUDO TRANSVERSAL SOBRE O CONHECIMENTO DOS ESTUDANTES DE MEDICINA DO COPO MENSTRUAL

AN ALTERNATIVE IN MENSES MANAGEMENT: A CROSS-SECTIONAL STUDY ABOUT MEDICAL STUDENTS KNOWLEDGE OF THE MENSTRUAL CUP

UNA ALTERNATIVA EN EL MANEJO DE LA MENSTRUACIÓN: ESTUDIO TRANSVERSAL DEL CONOCIMIENTO DE LOS ESTUDIANTES DE MEDICINA DE LA COPA MENSTRUAL

Joana Rodrigues<sup>1</sup>  <https://orcid.org/0000-0002-2445-6155>

Sara Cardoso<sup>1</sup>  <https://orcid.org/0000-0003-3314-4070>

<sup>1</sup> Universidade de Lisboa, Faculdade de Medicina, Clínica Universitária de Medicina Geral e Familiar, Lisboa, Portugal

Joana Rodrigues - joanacorreiarodrigues@gmail.com | Sara Cardoso - sarajoacardoso@gmail.com



**Corresponding Author**

Joana Correia Rodrigues  
Avenida Professor Egas Moniz  
1649-028 Lisboa - Portugal  
joanacorreiarodrigues@gmail.com

RECEIVED: 31<sup>th</sup> July, 2021

ACCEPTED: 15<sup>th</sup> November, 2021

## RESUMO

**Introdução:** O copo menstrual (CM) é uma alternativa na gestão da menstruação, sendo pouco conhecido. O objetivo deste estudo foi avaliar se os estudantes de Medicina da Faculdade de Medicina da Universidade de Lisboa (FMUL) conhecem o CM.

**Objetivo:** O principal objetivo deste estudo foi verificar se os alunos de medicina da Faculdade de Medicina de Lisboa (FMUL) conhecem bem o CM.

**Métodos:** Na primeira fase do estudo foi realizada uma revisão bibliográfica e estruturado um questionário que foi testado numa população piloto. A segunda fase iniciou-se após aprovação da Comissão de Ética e consistiu na aplicação do questionário a todos os estudantes de medicina da FMUL.

**Resultados:** Dos 2169 estudantes que receberam o questionário, obtiveram-se 970 respostas. A maioria conhecia o CM (93,8%), principalmente através das redes sociais, amigos e meios de comunicação social e menos frequentemente através da família, aulas, workshops/conferências e médico. A maioria deles conhecia as funcionalidades do CM, embora tivessem ideias erradas do mesmo. Das 755 mulheres, 108 já utilizavam o CM, sendo mais utilizado recentemente. A maioria das mulheres (39,6%) ponderou a sua utilização, sendo as de fluxo médio a abundante e as que utilizavam tampões as mais propícias.

**Conclusão:** Apesar dos estudantes de medicina da FMUL já terem ouvido falar do CM, ainda existe falta de conhecimento de todas as suas potencialidades. Tornando-se necessário investir na divulgação do mesmo em eventos académicos/científicos e cuidados de saúde. Por fim, deveria existir um maior investimento no currículo médico no que concerne aos métodos de gestão da menstruação.

**Palavras-chave:** copo menstrual; inquéritos e questionários; menstruação; gestão da menstruação; estudantes de medicina

## ABSTRACT

**Introduction:** The menstrual cup (MC) is a menses management alternative, being little known. This study objective was to discover if Lisbon School of Medicine (FMUL) medical students know the MC.

**Objective:** The main objective of this study was to verify whether the medical students of the Faculty of Medicine of Lisbon (FMUL) know the MC well.

**Methods:** In the study first phase, a bibliographic review was made and a questionnaire was structured and tested in a pilot population. The second phase started after the Ethics Committee approval and consisted on giving the questionnaire to all FMUL medical students.

**Results:** Of the 2169 students who received the questionnaire, there were obtained 970 responses. The majority of participants knew of the MC (93.8%), mainly from social networks, friends and social media and less frequently from family, lessons, workshops/conferences and doctor. Most of them were familiar with MC functions, although there were misconceptions. Of the 755 women, 108 already used the MC, being more recently used. Most women (39.6%) considered its use, being the most susceptible the ones with average-heavy menstrual flow and those who used tampons.

**Conclusion:** Although FMUL medical students heard about the MC, there is a lack of knowledge of all its potentialities. So, it is required to provide information about it in academic/scientific events and healthcare-centers. Finally, there should be a bigger investment in the medical curriculum regarding menses management.

**Keywords:** menstrual cup; surveys and questionnaires; menstruation; menses management; students, medical

## RESUMEN

**Introducción:** La copa menstrual (CM) es una alternativa en el manejo de la menstruación, siendo poco conocida. El objetivo de este estudio fue descubrir si los estudiantes de medicina de la Facultad de Medicina de Lisboa (FMUL) conocen la CM.

**Objetivo:** El principal objetivo de este estudio fue verificar si los estudiantes de medicina de la Facultad de Medicina de Lisboa (FMUL) conocen bien la CM.

**Métodos:** En la primera fase del estudio se realizó una revisión bibliográfica y se estructuró un cuestionario, que fue probado en una población piloto. La segunda fase se inició después de la aprobación del Comité de Ética y consistió en aplicar el cuestionario a todos los estudiantes de medicina de la FMUL.

**Resultados:** De los 2169 estudiantes que recibieron el cuestionario, se obtuvieron 970 respuestas. La mayoría conocía la CM (93,8%), principalmente de las redes sociales, amigos y medios de comunicación social y menos frecuentemente de la familia, clases, workshops/conferencias y médico. La mayoría conocía las funcionalidades de la CM, aunque tenían conceptos erróneos al respecto. De las 755 mujeres, 108 ya usaban la CM, siendo usado más recientemente. La mayoría (39,6%) consideró su uso, siendo las más susceptibles las que tenían un flujo menstrual medio-abundante y las que usaban tampones.

**Conclusión:** Aunque los estudiantes de medicina de la FMUL escucharon sobre la CM, existe un desconocimiento de todas sus potencialidades. Haciendo necesario invertir en su difusión en eventos académicos/científicos y centros de salud. Finalmente, debería haber un mayor investimento en el currículum médico al respecto del manejo de la menstruación.

**Palabras clave:** copa menstrual; encuestas y cuestionarios; menstruación; manejo de la menstruación; estudiantes de medicina

## INTRODUCTION

Menses management is essential for women, since menstruation is a physiological function that accompanies approximately half of their lives (Eijk et al., 2019; Huang & Huang, 2019). Menstrual behavior varies from culture to culture, and the menstrual product choice is associated with sociocultural values and beliefs, maternal education, sources of information available (Huang & Huang, 2019; Hait & Powers, 2019) and economic capacity (Phillips-Howard et al., 2015; Beksinska et al., 2015; Averbach, Sahin-Hodoglugil, Musara, Chipato, & Straten, 2009). Sometimes, menses can bring nefarious consequences for women's lives, which can interfere with their daily activities (Beksinska et al., 2015; Wall, Belay, Bayray, Salih, & Gabrehiwot, 2016; Zulaika et al., 2019) and also with their psychosocial well-being (Coast, Lattof, & Strong, 2019; Hennegan & Montgomery, 2016).

The most used menstrual hygiene products are sanitary pads and tampons. However, due to economic difficulties, some women end up using alternative products, such as old clothes, cloths, cotton, grass, socks, plastic and paper, sometimes reusing and using them for longer than recommended. This can limit their daily routine, cause discomfort and infections (Phillips-Howard et al., 2015; Beksinska et al., 2015; Averbach et al., 2009; Phillips-Howard et al., 2016).

The menstrual cup (MC), despite its long existence and being a safe and effective menses management alternative, is little known (North & Oldham, 2011). Like tampons, MC are inserted into the vagina, but the menstrual blood is collected instead of being absorbed, being able to collect 10-40mL of blood (Eijk et al., 2019; Stolz, Meuwly, Roussel, & Paulin, 2019). MC are flexible devices made of medical-grade silicone, rubber, latex or elastomer and can last up to 10 years; there are also disposable MC (for single use). The MC creates a slight vacuum against the vaginal walls to be correctly positioned, to remove the MC, the woman must squeeze it to break the vacuum (Eijk et al., 2019; Schnyer, Jensen, Edelman, & Han, 2019). The non-disposable MC should be emptied every 4-12 hours, depending on the menstrual flow and the type of cup (Eijk et al., 2019; Stolz et al., 2019), washed with water between uses (Oster & Thornton, 2012), being recommended to boil the cup at the end of each menstrual cycle (Zulaika et al., 2019). Besides being a menstrual hygiene product, the MC is also useful in vesicovaginal and enterovaginal fistulas (Russell, Robinson, Mone, & Scaife, 2016) and collecting cervicovaginal fluids (Jaumdally et al., 2018).

In comparison with sanitary pads and tampons, MC are ecological (Eijk et al., 2019; Stolz et al., 2019; Stewart, Greer, & Powell, 2010; Howard et al., 2011); economic, being the method that financially compensates the most over time (Eijk et al., 2019; Hait & Powers, 2019; Beksinska et al., 2015; Stewart et al., 2010; Howard et al., 2011); effective, offering as good or better protection in terms of leakage (Eijk et al., 2019); collect more blood, being more advantageous for women with menorrhagia (Stewart et al., 2010); do not cause vaginal dryness (Day, 2012); improve mobility and are not associated with an increased risk of infections (Eijk et al., 2019; Phillips-Howard et al., 2016; Oster & Thornton, 2012). Few side-effects have been reported (Stolz et al., 2019), however, some drawbacks have been described, namely fear that the introduction would be difficult or painful and that it might have reproductive tract consequences (Eijk et al., 2019); discomfort with inserting and removing the MC from the vagina and contact with menstrual blood (North & Oldham, 2011); difficulties with emptying the MC in public bathrooms; pain with MC use and allergies to the materials used in MC, although uncommon (Eijk et al., 2019). Furthermore, although rare, some cases of toxic shock syndrome have been described after MC use, even though some have not been confirmed (Eijk et al., 2019; Mitchell, Bisch, Arntfield, & Hosseini-Moghaddam, 2015). Hydronephrosis cases caused by urinary tract extrinsic compression have also been described, with complete symptoms remission after its removal (Eijk et al., 2019; Stolz et al., 2019; Nunes-Carneiro, Couto, & Cavadas, 2018). Moreover, a case of MC retention was also observed in a woman with little use experience (Day, 2012). Finally, some cases of intrauterine devices displacement have been described, however further studies are needed to better investigate this relationship (Eijk et al., 2019; Wiebe & Trouton, 2012; Seale, Powers, Guiahi, & Coleman-Minahan, 2019).

Taking all into account, the main objective of this study was to discover if Lisbon School of Medicine (FMUL) medical students are knowledgeable about the MC. On one hand, they are a young population, with many reproductive age women, and on the other hand, future doctors must be well informed about all menses management methods used, including the MC (Stolz et al., 2019; Day, 2012; Nunes-Carneiro et al., 2018). Simultaneously, it was also had the following specific objectives: identify the ways that FMUL medical students knew of the MC; verify if FMUL medical students know the MC functionalities; find at what age FMUL medical students started using the MC; know the reasons why FMUL medical students who know the MC do not use it; evaluate the interest of FMUL medical students in using the MC; discover the reasons why FMUL medical students use the MC or would use it; understand if the FMUL medical curriculum plan, in terms of menses management methods, is being profitable.

## 1. METHODS

To carry out this study, the following research platforms were used: UpToDate; Dynamed; MedScape; BMJ; NICE; TRIP; Cochrane Library; Web of Science; PubMed and *Repositórios Científicos de Acesso Aberto de Portugal* (RCAPP) between the period of October 2 to November 3, 2019. The research terms used were "menstrual cup"; "vaginal cup"; "menstrual collector" and "menstrual hygiene items". Inclusion criteria were studies related with MC, studies about menses management methods and environmental and economic studies related to menses management methods (Figure 1).

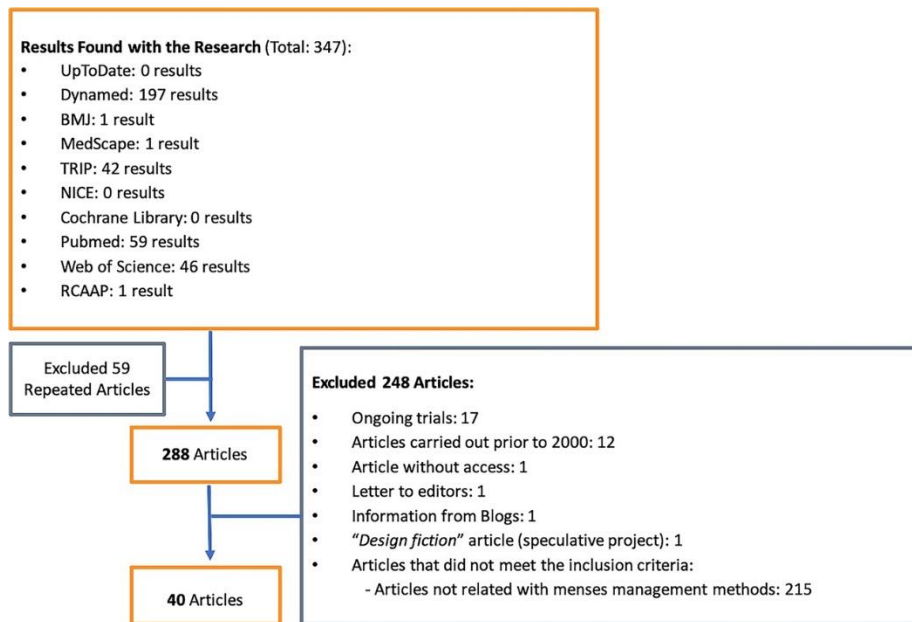


Figure 1 – Bibliographic research methodology used.

Based on the bibliographic review, a questionnaire was created, with a total of 12 questions, with an introduction and two parts. In the introduction, it was clarified the study, its main objective, the expected duration for completing it, confidentiality and anonymity of the responses collected, as well as the consent to participate in the study. The first part could be filled by all participants, while the second part could only be answered by female participants (Table 1).

Table 1 – Questions contained in the questionnaire.

First Part	1. What is your biological sex? <u>Options:</u> Female; Male; Other (Which?)
	2. What medical school year are you currently in? <u>Options:</u> 1 <sup>st</sup> Year; 2 <sup>nd</sup> Year; 3 <sup>rd</sup> Year; 4 <sup>th</sup> Year; 5 <sup>th</sup> Year; 6 <sup>th</sup> Year
	3. How old are you?
	4. Have you heard of the menstrual cup until now? <u>Options:</u> Yes; No; I don't know
	5. If you already knew of the Menstrual Cup before this questionnaire, how did you find out about its existence? (You can pick more than one option). <u>Options:</u> Friends; Family; College Lessons; Workshops/ Conferences; Social Media; Doctor; Social Networks; I don't know; Other (Which?)
	6. In your opinion, before this questionnaire, what is/ are the functionality/ functionalities of the menstrual cup? (You can pick more than one option). <u>Options:</u> Measurement of the menstrual flow amount; Use in scientific studies; Menses management method; I don't know; Other (Which?)
Second Part	7. What hygiene method do you use during menstruation? (You can pick more than one option). <u>Options:</u> Sanitary Pads; Tampons; Menstrual Cup; Other (Which?)
	8. If you answered "Menstrual Cup" in the previous question, since what age do you use it?
	9. How much menstrual flow do you think you have? <u>Options:</u> Light; Average; Heavy; Very heavy; I don't know
	10. If you do not use the menstrual cup, do you consider its use? <u>Options:</u> Yes; No; I don't know
	11. If you know the menstrual cup, why don't you use it? (You can pick more than one option). <u>Options:</u> Need to wash between uses/ changes; Need to use your hands to change the menstrual cup; Possible leakage due to bad placement; Having a foreign body in the vagina; I don't know; Other (Which?)
	12. Which of the following would make you or has made you use the menstrual cup? (You can pick more than one option). <u>Options:</u> Change the menstrual hygiene method you use less often during the day, due to the greater capacity of the menstrual cup; No need to carry menstrual hygiene products; Economic factors (the same cup can be used for several years); Environmental factors; Be a collector that collects menstrual blood and not an absorber that absorbs it; Improving mobility; Not be associated with an increased risk of infections; I don't know; Others (Which?)

The questionnaire was applied to all FMUL medical students enrolled in the academic year 2019/2020, excluding the main investigator, making a total of 2169 students (Appendix 1). Before being applied to the target population, the questionnaire was pre-tested on a pilot population of six FMUL Nutrition Sciences Degree students.

Initially, the questionnaire was applied on paper at the different curricular years' mandatory attendance classes. However, due to the COVID-19 pandemic, FMUL closed and there was no more presential classes, so the questionnaire was converted into an online form. A question was added regarding the course the participant was taking, in order to ensure that only FMUL medical students would be counted. The questionnaire was sent by e-mail to all medical students and in order to increase the response rate, it was also shared in all years private Facebook groups.

The questionnaire was active online for 24 days, being programmed to accept only one answer per participant, being impossible to answer it again or edit the previous answer. To prevent students who had previously answered the questionnaire manually from answer it again, it was warned that anyone who had previously answered the questionnaire on paper, should not answer it again.

The data were copied to a database in Excel® and IBM® SPSS® Statistics version 24. In order to minimize transposition errors, the data from the paper questionnaires were double checked. The data were analyzed using descriptive statistical analysis.

Prior to the questionnaire application, an authorization request to conduct the study was made to the FMUL Director. After his authorization, a request was submitted to the Ethics Committee from *Centro Hospitalar Lisboa Norte e Centro Académico de Medicina de Lisboa*, which approved the study.

## 2. RESULTS

Of the 2169 students to whom the questionnaire was delivered/sent, 988 responses were obtained, 162 in paper format and 826 in digital format. Of those 988 responses, 18 were excluded because the participants were not FMUL medical students (n=17) and due to inadequate responses (n=1), being the final sample total 970 students, corresponding to 44.7% of the population. (Table 2)

**Table 2** – Total number, distribution by school years and biological sex of Lisbon School of Medicine medical students enrolled in the academic year 2019/2020, excluding the main investigator.

Biological sex	Year						Total
	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year	6 <sup>th</sup> Year	
Female	267	254	239	232	251	224	1467
Male	112	102	141	110	124	113	702
<b>Total</b>	<b>379</b>	<b>356</b>	<b>380</b>	<b>342</b>	<b>375</b>	<b>337</b>	<b>2169</b>

The final sample consisted of students from all medical school years and from both sexes, with an age dispersion between 17 and 44 years, with an average age of 22±3 years. Most of the participants were female and were in the 4th year (Table 3).

**Table 3** – Participants Characteristics.

Medical School Year	Biological Sex %(n)		Age (Years) %(n)				Total Participants %(n)
	Female	Male	≤18	19-21	22-24	≥25	
1 <sup>st</sup>	12.2 (118)	4.2 (41)	8.6 (83)	6.5 (63)	0.2 (2)	1.1 (11)	16.4 (159)
2 <sup>nd</sup>	14.7 (143)	3.9 (38)	-	16.1 (156)	0.9 (9)	1.6 (16)	18.7 (181)
3 <sup>rd</sup>	12.8 (124)	3.7 (36)	-	12.5 (121)	2.5 (24)	1.5 (15)	16.5 (160)
4 <sup>th</sup>	15.1 (146)	3.8 (37)	-	7.5 (73)	10.2 (99)	1.1 (11)	18.9 (183)
5 <sup>th</sup>	11.3 (110)	3.3 (32)	-	0.1 (1)	13 (126)	1.5 (15)	14.6 (142)
6 <sup>th</sup>	11.8 (114)	3.2 (31)	-	-	12 (116)	3 (29)	14.9 (145)
<b>Total %(n)</b>	<b>77.8 (755)</b>	<b>22.2 (215)</b>	<b>8.6 (83)</b>	<b>42.7 (414)</b>	<b>38.8 (376)</b>	<b>10 (97)</b>	<b>100 (970)</b>

n – Number of participants

When asked whether they knew of the MC before answering the questionnaire, 93.8% of participants (n=910) answered “yes” and 5.6% (n=54) answered “no”. Of the 910 who answered that they knew of the MC, the majority were female (76.2%; n=739), while the majority of those who answered that they did not know, were male (4.3%; n=42). Additionally, there was no great variation in the different medical school years among the participants who knew of the MC.

The question about how the participants who already knew of the MC, heard about it was answered by 907 participants. More than one answer was allowed, resulting in 1731 total answers. The majority of student knew of the MC from social networks,

friends and social media (Figure 2), which did not change as a function of gender or school year. Observing in more detail the topic “college lessons”, we realized that, despite having been little mentioned by all years, there was no greater frequency in the participants attending the most advanced years comparing with the initial years. However, if we separate the school years in pre-clinical years (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> years) and clinical years (4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> years) we can see that the frequency was slightly higher in clinical years (4.8%; n=43) compared to preclinical years (3.5%; n=32). Considering the answer “other”, the majority reported having known the MC through basic/secondary education school classes (30.2%; n=13) and the internet (20.9%; n=9).

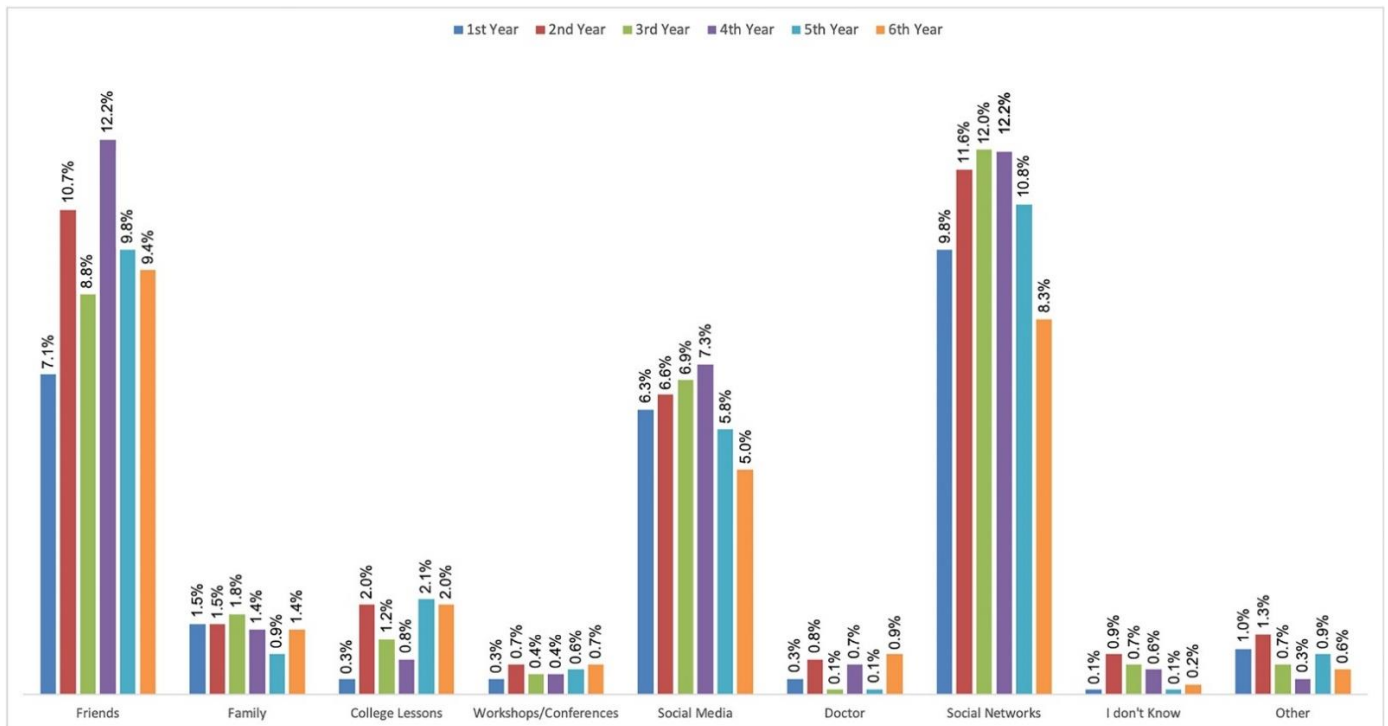


Figure 2 – Ways in which the participants (by medical school year) knew of the Menstrual Cup.

MC functionalities was assessed by all except 4 participants (n=906) who knew of the MC. Since multiple answers were allowed, a total of 1424 answers were recorded. Most participants answered that the MC serves as a menses management method followed by the measurement menstrual flow amount (Figure 3), which was not affected by school year. Considering the answer “other”, the majority mentioned that the MC is more ecological (48.9%; n=46) and it is an alternative to the remaining menstrual products (20.2%; n=19).

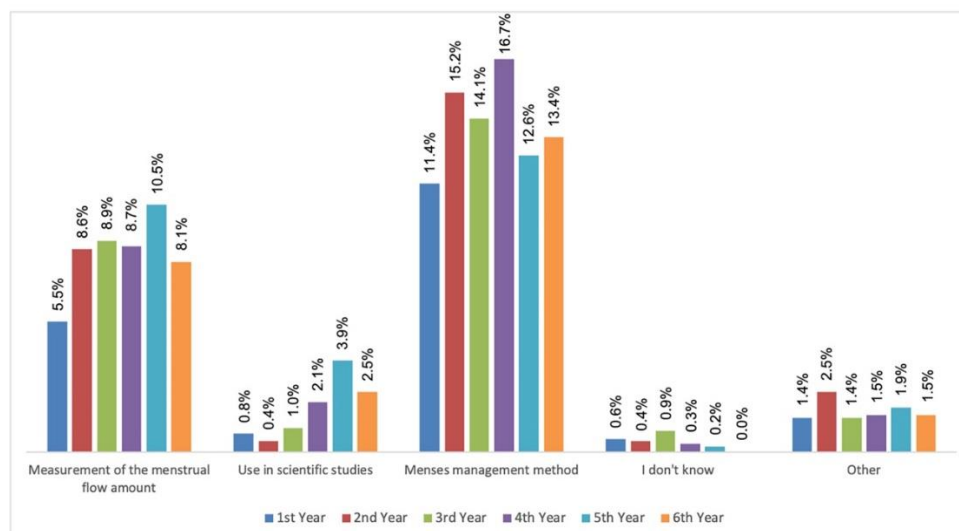


Figure 3 – Choice of the menstrual cup functionalities of the participants who knew it by medical school years.

The second part of the questionnaire was only applicable to female participants (n=755). Most of them used the sanitary pads (80.3%; n=606) as a menses management method, followed by the tampons (57.5%; n=434) and the MC (14.3%; n=108). This question allowed more than one answer resulting in 1157 responses. The majority of the “other” answers (1.2%; n=9) reported using reusable sanitary pads (44.4%; n=4). Of the 80.3% (n=606) women who used the sanitary pads, 38.1% (n=231) used only them as a menses management method; as for the tampons, of the 57.5% (n=434) that used them, only 15.7% (n=68) used them alone. On the other hand, of the 14.3% (n=108) participants who used the MC, 59.3% (n=64) used it exclusively as a menses management method.

When asked about the age they started using the MC, almost all responded (n=106 of 108), with an average age of 21±3 years and an age range of 16–33 years. On average participants reported using the MC for an average 1±1 year with a range of less than 1 year up to 6 years.

Regarding the menstrual flow amount (n=752), the majority reported having an average flow (56.5%; n=425), followed by heavy flow (21.5%; n=162, light flow (19.0%; n=143), while the least frequent was very heavy flow (2.4%; n=18), with 4 participants not knowing how to quantify their flow amount. There was no great variation between methods used and flow categories with sanitary pads being used most in all flow categories.

When asked about the possibility of using the MC, most participants who did not use the MC expressed interest (39.6%; n=256), followed by those who did not consider its use (32.5%; n=210), with some participants answering “I don't know” (28.0%; n=181). This question was answered by all students who did not use the MC, making a total of 647 responses. Analyzing the MC use interest in the different menstrual flow categories, it can be seen that most women with light flow did not consider the use of the MC, whereas, most women with average and heavy flow pondered its use (Figure 4).

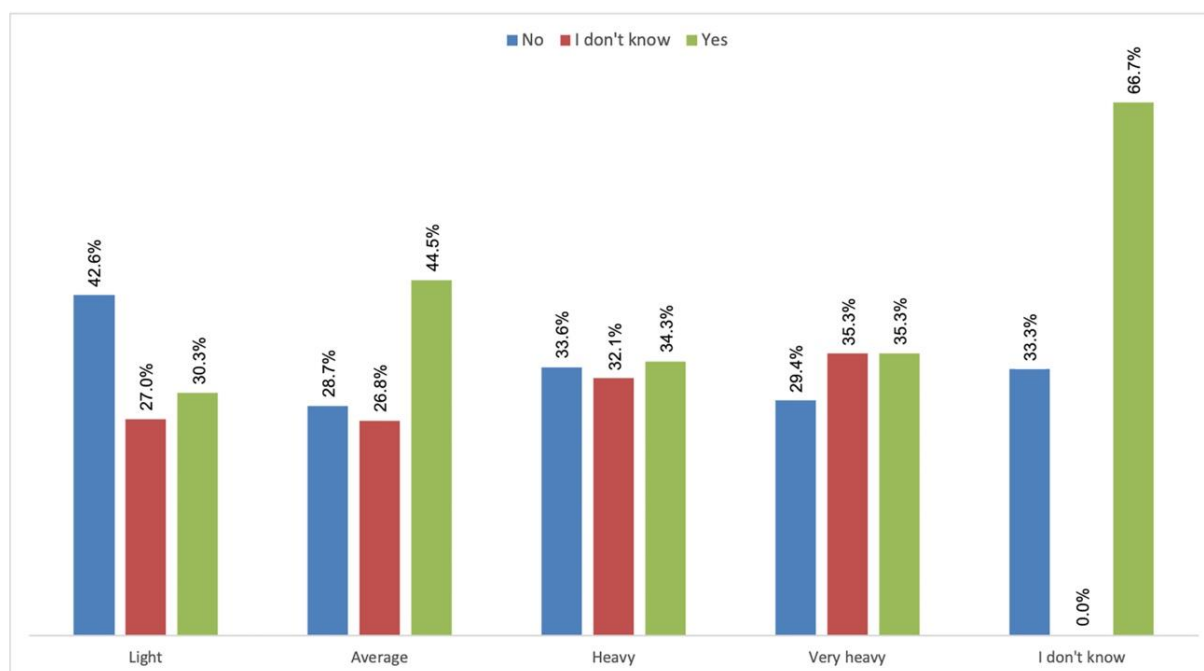


Figure 4 –Menstrual cup use interest by female participants who did not use it in the various menstrual flow quantification categories.

Analyzing MC use interest by students who only used sanitary pad (n=231) or tampon (n=68), it is clear that the majority of participants who only used tampons considered its use (44.1%; n=30), being those who did not consider a minority (32.4%; n=22), while the majority of participants who only used the sanitary pad did not consider its use (43.3%; n=100), with a minority considering its use (25.5%; n=59). The question inquiring about the reason(s) why participants (n=631) who knew of the MC and did not use it (Table 4) allowed more than one answer, resulting in 1154 responses.

**Table 4** – Reasons why female participants who knew of the menstrual cup did not use it.

	n	%
Need to wash between uses/ changes	309	49.0
Need to use your hands to change the menstrual cup	130	20.6
Possible leakage due to bad placement	306	48.5
Having a foreign body in the vagina	224	35.5
I don't know	58	9.2
Other	127	20.1
<b>Characterization of the answers "Other"</b>	<b>n</b>	<b>%</b>
Parental acceptance	2	1.6
I haven't put it on yet	2	1.6
No interest has arisen yet	3	2.4
The opportunity to buy the menstrual cup has not arisen yet	15	11.8
Amenorrhea	2	1.6
Acquisition of an inadequate size	1	0.8
Comfortable, accustomed and satisfied with the method currently used	7	5.5
Discomfort with contact with the menstrual blood	2	1.6
Difficulty in adapting and using	5	3.9
Difficulty in placement and removal	19	15.0
Difficulty in choosing the menstrual cup*	1	0.8
Lack of information and accessibility**	21	16.5
Heavy menstrual flow	1	0.8
Light menstrual flow	3	2.4
Dislike using tampons	2	1.6
Not being sexually active	1	0.8
Unhygienic	3	2.4
Fear of the menstrual cup size	1	0.8
Not practical to use outside home	9	7.1
Price	8	6.3
Propitious to infections	2	1.6
Fear of discomfort	8	6.3
Fear of use due to vaginismus	1	0.8
Fear	5	3.9
Civilizational setback to when there were no sanitary pads	1	0.8
Reuse	1	0.8
Use of IUD*	1	0.8

n - Number of participants; \* IUD – intrauterine device; \* Brand, size and consistency; \*\* Lack of knowledge of possible side effects, safety and places of sale.

Regarding the reasons that made or would make women use the MC, most of them mentioned environmental factors (76.1%; n=571), followed by the fact that it can be changed less often during the day, due to the greater capacity of the MC (54.7%; n=410), economic factors (51.9%; n=389) and not being associated with an increased risk of infections (40.0%; n=300). The reasons with less frequency were the fact that the MC is a collector that collects menstrual blood and not an absorber that absorbs it (7.2%; n=54); improved mobility (13.5%; n=101) and no need to carry menstrual hygiene products (26.1%; n=196). Regarding the answer "others" (1.5%; n=11), most women said that they are not interested in its use (36.4%; n=4). This question allowed more than one answer, being the total responses number 2077.

### 3. DISCUSSION

This was the first study that specifically examined medical students knowledge of the MC, as well as male individuals. Contrary to two previous studies (Eijk et al., 2019; Stewart, Powell, & Greer, 2009), it was concluded that the majority of participants considered having heard about the MC, corresponding to 42.0% of all FMUL medical students.

Of the participants who knew of the MC, the majority were female. This is possibly due to the fact that menses management is a female necessity. Moreover, analyzing the way that participants were aware of it, it was concluded that the school years did not seem to influence the ways in which participants knew of the MC. Furthermore, although there was a higher responses frequency in the option "college lessons" in the clinical years' participants compared to the preclinical years' participants, this difference was small (1.4%). Therefore, although it was expected that as the school years advance the probability that students have already heard about the MC in college lessons will increase, since there was only a minority of participants who reported having been aware of the MC from college lessons, as well as academic/scientific events, it can be assumed that the curriculum plan may not be profitable regarding menses management methods.



Regarding the MC functionalities, some participants answered that they did not know the MC functionalities, despite having mentioned that they had already heard about it. As for the answers “other”, most participants add as a MC functionality the fact that it is ecological, being the majority of the answers in this option MC characteristics and not exactly its functionalities. In addition, despite the fact that most of them knew most of the MC functionalities, few participants mentioned the MC use in scientific studies, and no participant mentioned its usefulness in vesicovaginal and enterovaginal fistulas (Russell et al., 2016) and collecting cervicovaginal fluids (Jaumdally et al., 2018), functions closely related to medical activity.

Analyzing the second part of the questionnaire, most participants used the sanitary pad as a menses management method followed by the tampon and finally the MC. Of the women who reported using the sanitary pad and tampon, only a minority used them exclusively; the opposite occurs in participants who used the MC, with the majority of women using it exclusively. So, it can be concluded that women who use the MC consider it enough to supply the totality of their menstrual needs.

Among the students that used the MC, the average age at which they started using it was 21±3 years, being that several years after menarche. In addition, the majority of participants have used the MC for 1±1 year, being concluded that the MC use is becoming more and more frequent, which may be due to the fact that MC is well accepted by women (Eijk et al., 2019; Huang & Huang, 2019; Beksinska et al., 2015; North & Oldham, 2011; Howard et al., 2011), and it is consequently gaining popularity. Furthermore, the menstrual behavior has a great knowledge transmission through socialization, and the fact that more and more women have started using the MC, may have led to share the use experience with people they know, increasing the method adoption (Oster & Thornton, 2012).

Regarding the menstrual flow amount, most participants considered having average flow, with no variation between the menses management methods used depending on the menstrual flow. Even so, it is important to mention that the menstrual flow quantification is somewhat subjective, and an English study showed that neither the catamens duration nor the number of sanitary pads used correspond to the actual blood lost amount (Stewart et al., 2010).

As for the possible interest in the MC use, most of participants who did not use the MC expressed interest, with a significant percentage of participants who did not know whether or not they were interested in its use. These results are in line with other studies, one carried out in Zimbabwe, which questioned 43 women, and another carried out in the United Kingdom, which questioned 69 women, who concluded that the majority of participants expressed interest in the MC use (Averbach et al., 2009; Stewart et al., 2009). However, one of this studies was carried out in women with many difficulties in the menses management, so the MC may have been received with greater enthusiasm, and these results may not be reproducible in other contexts (Averbach et al., 2009).

When analyzing the MC use interest in the different menstrual flow categories, it was concluded that the students who presented average to heavy flow were the most likely to use the MC, in agreement with the English study mentioned above (Stewart et al., 2009). On the other hand, a Taiwan study, which questioned 1245 women, showed that women who considered to have average flow had low intent in the MC use, being the results of the participants with light and heavy flow in agreement with those presented (Huang & Huang, 2019).

Analyzing the MC use interest by students who used only the sanitary pad or tampon, it appears that students who used only the tampon were the most likely to use the MC, compared to women who only used the sanitary pad. These results are in line with the English and Taiwan studies mentioned above (Huang & Huang, 2019; Stewart et al., 2009). In spite of this, it is also important to highlight a South Africa study, which concluded that the MC was well accepted, more comfortable, tolerated and the preferred method of the majority of the 110 participants, even by women who did not usually use the tampon (Beksinska et al., 2015).

Regarding the reasons why the participants who knew of the MC did not use it, the most mentioned were the need to wash between uses/changes and the possible leakage due to bad placement. In addition to these options, some participants answered other responses, referring more often the lack of information and accessibility of the MC and the possible difficulty in placing and removing the MC, however some studies have shown that this difficulty is overcome with the use experience that is gained over time (Beksinska et al., 2015; Oster & Thornton, 2012; Howard et al., 2011). The English study showed that the reasons mentioned by the participants were similar (Stewart et al., 2009). On the other hand, in the Zimbabwe study, these were different, possibly due to the population cultural and socioeconomic differences (Averbach et al., 2009). Analyzing the remaining “other” options, it can be concluded that some participants have some misconceptions regarding the MC. Therefore, similarly to what was mentioned by some researchers, there is still a lack of knowledge of all MC potentialities (Eijk et al., 2019; Hait & Powers, 2019), requiring a more effective health education about menses management products (Eijk et al., 2019; Huang & Huang, 2019).

Finally, regarding the reasons that made or would make women use the MC, most of them referred environmental factors, being the results found similar to those presented by two English studies (Stewart et al., 2010; Stewart et al., 2009). Though, the reasons mentioned in the Zimbabwe study were different, possibly due to different social and socioeconomic contexts (Averbach et al., 2009). Taking all into account, although there are variations in the motivations for the MC use taking into account the women cultural and socioeconomic context, there is a great environmental concern, being one of the main reasons why students used or would use the MC.

## CONCLUSION

Despite 42.0% of FMUL medical students have heard about the MC, there is still a lack of knowledge of all its potentialities. In addition, it is essential to have a greater investment in dissemination of information about the MC in events of a more academic and scientific nature, as well as in healthcare centers.

Finally, as future doctors, it is essential to acquire this knowledge, since the MC is increasingly used, consequently there is a greater need to be alert to the existence of possible adverse effects, as well as to be able to clarify any doubts that users may have. In this sense, there should be a bigger investment in the FMUL medical curricular plan regarding menses management methods.

## STUDY LIMITATIONS

Due to the COVID-19 pandemic, it was not possible to comply with the methodology initially outlined, which may have led to a final sample size decrease. In addition, the fact that the sample was small, with concentrated ages and made up of very differentiated people in the health area, does not allow to generalize the results to the general population.

## REFERENCES

- Averbach, S., Sahin-Hodoglugil, N., Musara, P., Chipato, T., & Straten, A. van der. (2009). Duet for menstrual protection: a feasibility study in Zimbabwe. *Contraception*, 79(6), 463–468. DOI: 10.1016/j.contraception.2008.12.002.
- Beksinska, M. E., Smit, J., Greener, R., Todd, C. S., Lee, M-L. T., Maphumulo, V., & Hoffmann, V. (2015). Acceptability and Performance of the Menstrual Cup in South Africa: A Randomized Crossover Trial Comparing the Menstrual Cup to Tampons or Sanitary Pads. *Journal of Women's Health*, 24(2), 151–158. DOI: 10.1089/jwh.2014.5021
- Coast, E., Lattof, S. R., & Strong, J. (2019). Puberty and menstruation knowledge among young adolescents in low- and middle-income countries: a scoping review. *International Journal of Public Health*, 64(2), 293–304. DOI: 10.1007/s00038-019-01209-0.
- Day, S. (2012). A retained menstrual cup. *International Journal of STD and AIDS*, 23,367–368. DOI: 10.1258/ijsa.2011.011277
- Eijk, A. M. Van, Zulaika, G., Lenchner, M., Mason, L., Sivakami, M., Nyothach, E.,...Phillips-Howard, P. A. (2019). Menstrual cup use, leakage, acceptability, safety, and availability: a systematic review and meta-analysis. *The Lancet Public Health*, 4(8), e208-15. DOI: 10.1016/S2468-2667(19)30111-2.
- Hait, A., & Powers, S. E. (2019). The value of reusable feminine hygiene products evaluated by comparative environmental life cycle assessment. *Resources, Conservation & Recycling*, 150, 1–10. DOI: 10.1016/j.resconrec.2019.104422.
- Hennegan, J., & Montgomery, P. (2016). Do Menstrual Hygiene Management Interventions Improve Education and Psychosocial Outcomes for Women and Girls in Low and Middle Income Countries? A Systematic Review. *Plos One*, 49, 1–21. DOI: 10.1371/journal.pone.0146985
- Howard, C., Rose, C. L., Trouton, K., Stamm, H., Marentette, D., Kirkpatrick, N.,...Paget, J. (2011). FLOW (finding lasting options for women): multicentre randomized controlled trial comparing tampons with menstrual cups. *Canadian Family Physician*, 57, e208–e215.
- Huang, P-T., & Huang, J-H. (2019). Menstrual Cup Use Intention and the Moderating Effects of Sexual Orientation and Gender Characteristic Among Female University Students in Taiwan: A Theory - Driven Exploration. *Archives of Sexual Behavior*, (0123456789), 1–12. DOI: 10.1007/s10508-019-1412-y.
- Jaumdally, S. Z., Masson, L., Jones, H. E., Dabee, S., Hoover, D. R., Gamielidien, H.,...Passmore, J-A. S. (2018). Lower genital tract cytokine profiles in South African women living with HIV: influence of mucosal sampling. *Scientific Reports*, (August, :1–12. DOI: 10.1038/s41598-018-30663-8
- Mitchell, M. A., Bisch, S., Arntfield, S., & Hosseini-Moghaddam, S. M. (2015). A confirmed case of toxic shock syndrome associated with the use of a menstrual cup. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 26(4), 218–221. DOI: 10.1155/2015/560959.
- North, B. B., & Oldham, M. J. (2011). Preclinical, Clinical, and Over-the-Counter Postmarketing Experience with a New Vaginal Cup: Menstrual Collection. *Journal of Women's Health*, 20(2), 303–311. DOI: 10.1089=jwh.2009.1929
- Nunes-Carneiro, D., Couto, T., & Cavadas, V. (2018). Is the menstrual cup harmless? A case report of an unusual cause of renal colic. *International Journal of Surgery Case Reports*, 46, 28–30. DOI: 10.1016/j.ijscr.2018.04.002.

- Oster, E., & Thornton, R. (2012). Determinants of technology adoption: peer effects in menstrual cup take-up. *Journal of the European Economic Association*, 0(0), 1–31. DOI: 10.1111/j.1542-4774.2012.01090.x
- Phillips-Howard, P. A., Otieno, G., Burmen, B., Otieno, F., Odongo, F., Odour, C.,...Laserson, K. F. (2015). Menstrual Needs and Associations with Sexual and Reproductive Risks in Rural Kenyan Females: A Cross-Sectional Behavioral Survey Linked. *Journal of Women's Health*, 24(10), 801–811. DOI: 10.1089/jwh.2014.5031
- Phillips-Howard, P.A., Nyothach, E., Kuile, F. O. Ter, Omoto, J., Wang, D., Zah, C.,...Laserson, K. F. (2016). Menstrual cups and sanitary pads to reduce school attrition, and sexually transmitted and reproductive tract infections: a cluster randomised controlled feasibility study in rural Western Kenya. *BMJ*, 1–11. DOI: 10.1136/bmjopen-2016-013229
- Russell, K. W., Robinson, R. E., Mone, M. C., & Scaife, C. L. (2016). Enterovaginal or Vesicovaginal Fistula Control Using a Silicone Cup. *Obstetrics & Gynecology*, 128(6), 1365–1368. DOI: 10.1097/AOG.0000000000001745
- Schnyer, A. N., Jensen, J. T., Edelman, A., & Han, L. (2019). Do menstrual cups increase risk of IUD expulsion? A survey of self-reported IUD and menstrual hygiene product use in the United States. *The European Journal of Contraception & Reproductive Health Care*, 0(0), 1–5. DOI: 10.1080/13625187.2019.1643836.
- Seale, R., Powers, L., Guiahi, M., & Coleman-Minahan, K. (2019). Unintentional IUD expulsion with concomitant menstrual cup use: a case series. *Contraception*, 100(1), 85–87. DOI: 10.1016/j.contraception.2019.03.047.
- Stewart, K., Powell, M., & Greer, R. (2009). An alternative to conventional sanitary protection: Would women use a menstrual cup? *Journal of Obstetrics and Gynaecology*, 29, 49–52. DOI: 10.1080/01443610802628841
- Stewart, K., Greer, R., & Powell, M. (2010). Women's experience of using the Mooncup. *Journal of Obstetrics and Gynaecology*, 30, 285–287. DOI: 10.3109/01443610903572117
- Stolz, A., Meuwly, J-Y., Roussel, A., & Paulin, E. N. (2019). An improperly positioned menstrual cup complicated by hydronephrosis: A case report. *Case Reports in Women's Health*, 22, 1–3. DOI: 10.1016/j.crwh.2019.e00108.
- Wall, L. L., Belay, S., Bayray, A., Salih, S., Gabrehiwot, M. (2016). A community-based study of menstrual beliefs in Tigray, Ethiopia. *International Journal of Gynecology and Obstetrics*, 135, 310–313. DOI: 10.1016/j.ijgo.2016.05.015.
- Wiebe, E. R., & Trouton, K. J. (2012). Does using tampons or menstrual cups increase early IUD expulsion rates? *Contraception*, 86(2), 119–121. DOI: 10.1016/j.contraception.2011.12.002.
- Zulaika, G., Kwaro, D., Nyothach, E., Wang, D., Zielinski-Gutierrez, E., Mason, L.,...Phillips-Howard, P. A. (2019). Menstrual cups and cash transfer to reduce sexual and reproductive harm and school dropout in adolescent schoolgirls: study protocol of a cluster-randomised controlled trial in western Kenya. *BMC Public Health*, 1–14. DOI: 10.1186/s12889-019-7594-3.