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***“Impact of a personalized and evidence-based model on
the improvement of preventive care: influence on medical
student training”***

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MESTRE NO ÂMBITO DO CICLO DE ESTUDOS DO MESTRADO INTEGRADO EM
MEDICINA

**Impact of a personalized and evidence-based model on the improvement of preventive
care: influence on medical student training**

*Impacto de um modelo personalizado e baseado na evidência na melhoria dos cuidados
preventivos: impacto na formação de estudantes de Medicina*

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ACRONYMS AND ABBREVIATIONS

FMUC – Faculdade de Medicina da Universidade de Coimbra, Portugal

USPSTF – United States Preventive Services Task Force

ROS – Review of Systems

BMI – Body Mass Index

NHS – Portuguese National Health Service

SPSS – Statistical Package for the Social Sciences of Windows

FOBT – Fecal Occult Blood Test

PSA - Prostate-Specific Antigen Test

PHQ-4 – Patient Health Questionnaire-4

CT – Computed Tomography

BMA – British Medical Association

GPs - General practitioners

RESUMO

Introdução: A medicina preventiva desempenha um papel crucial na promoção do bem-estar das pessoas, prevenindo doenças, incapacidades e morte prematura. Apesar da sua relevância, notam-se crescentes preocupações no conhecimento e competências dos estudantes de medicina nessa área. Este estudo visou avaliar se o conhecimento preventivo dos alunos do 6º ano estava de acordo as recomendações mais recentes e explorar as suas perspetivas sobre as vantagens das consultas de rotina, analisando também diferenças entre sexos.

Métodos: Este estudo observacional e transversal utilizou um inquérito online, apresentando um caso clínico sobre intervenções preventivas aos estudantes do 6º ano da Faculdade de Medicina da Universidade de Coimbra, para avaliar a concordância com as recomendações do *United States Preventive Services Task Force* e da Direção Geral da Saúde, Portugal. Foi realizada análise descritiva e utilizado o teste de Mann-Whitney U para investigar diferenças entre sexos.

Resultados: Numa amostra representativa do universo de 144 alunos a proporção média de respostas corretas para a implementação de intervenções foi de 88,1%, com diferenças significativas entre sexos na medição de peso e altura, favorecendo o sexo feminino. Quanto à frequência de exames preventivos, a proporção média de respostas corretas foi de 73,1%, com diferenças significativas entre sexos para o eletrocardiograma ($p=0,023$) e radiografia do tórax ($p=0,013$), com menor frequência de requisições por parte do sexo feminino. Os exames de rastreio obtiveram uma proporção média de respostas corretas de 85,8%, verificando-se mais repostas a tender para a não requisição no caso do sexo feminino, com exceção do teste de antígeno específico da próstata. Quando questionados sobre os benefícios das consultas de rotina, a pontuação foi mais baixa, com uma proporção média de respostas corretas de apenas 59,0%, sem diferenças significativas entre sexos.

Discussão: Os estudantes mostraram uma forte adesão à prática baseada na evidência relativamente às consultas de rotina, exames preventivos e rastreio. Reconheceram o impacto positivo das consultas de rotina no controlo de fatores de risco e na utilização de serviços clínicos preventivos, assim como o seu menor impacto na redução do risco cardiovascular, questionaram a sua influência na deteção de doenças crónicas e na melhoria da qualidade de vida, sugerindo margem para melhorias. Identificaram-se limitações devido à realização do estudo através de um inquérito online numa única universidade.

Conclusão: Os estudantes de medicina do 6º ano da FMUC mostraram um conhecimento sólido de Medicina Preventiva, as alunas destacando-se na solicitação de exames apropriados. O desempenho dos alunos foi menos satisfatório quando questionados sobre os benefícios das consultas de rotina, sugerindo lacuna no conhecimento sobre a efetividade e importância das visitas preventivas periódicas em contraste com as consultas de rotina anuais.

Palavras-chave: Medicina Baseada na Evidência, Estudantes de Medicina, Visitas Preventivas Periódicas, Serviços de Saúde Preventivos.

ABSTRACT

Introduction: Preventive medicine plays a pivotal role in enhancing people's well-being promoting anticipative healthcare with the goal of preventing disease, disability, and premature death. Despite its significance, concerns about knowledge and skills gaps among medical students in preventive areas are growing. This study aimed to analyze whether the preventive knowledge of 6th-year medical students at the Faculty of Medicine of the University of Coimbra, was in line with the latest recommendations. Additionally, it sought to examine students' perspectives on the advantages of routine appointments and investigate potential gender differences across various components.

Methods: This observational cross-sectional study employed an online inquiry, presenting a clinical case on preventive interventions to 6th-year students at the Faculty of Medicine of the University of Coimbra via invitation to answer a Google Forms. The aim was to assess agreement with recommendations from the United States Preventive Services Task Force and Portuguese National Health Directorate standards. Descriptive analysis and the non-parametric Mann-Whitney U test were used for gender-based differences.

Results: In a size representative convenience sample of $n=144$ students the average correct response rate for intervention implementation was 88.1%, with significant gender variations in weight and height measurement, favoring females. For preventive exam frequency, the average correct response rate was 73.1%, with significant gender differences for electrocardiograms ($p=0.023$) and chest X-rays ($p=0.013$), indicating less frequent requests by females. Screening exams had an 85.8% correct response rate, with females leaning towards more negative responses, except for the Prostate-specific antigen test. Perceived benefits of routine health assessments scored the lowest, with a 59.04% correct response rate and no significant gender differences.

Discussion: Students showed strong adherence to evidence-based practices in routine consultations, preventive exams and screening. Despite recognizing the positive impact of routine consultations on improved risk factor control and increased utilization of preventive clinical services, as well as their lack of impact on reducing cardiovascular risk, they questioned their influence on chronic disease detection and quality of life improvement, suggesting room for improvement. Limitations were noted due to the study's online nature and single-university focus.

Conclusion: The 6th-year medical students at FMUC demonstrated solid knowledge of Preventive Medicine, with female students showing particular proficiency in requesting appropriate exams. The students performed less satisfactorily when asked about the benefits

of routine consultations, suggesting a deficit in awareness regarding the efficacy and importance of periodic preventive visits in contrast to annual routine check-ups.

Keywords: Evidence-based medicine, Medical Students, Periodic preventive visits, Preventive Health Services

1. INTRODUCTION

Preventive medicine is the practice of promoting anticipative health care to improve patient well-being. The goal is to ultimately prevent disease, disability, and premature death. Preventive medicine physicians can help patients develop healthy habits, break old habits, and reshape their approach to wellness. [1,2] Prevention represents one of the most powerful strategies for reducing morbidity and mortality [3] and has become increasingly important due to the worldwide surge of non-communicable diseases, posing a substantial public health problem, once vaccines and other tactics could reduce the communicable ones. [4] Nonetheless, there is an increasing concern regarding the gaps in knowledge and skills in medical students across various preventive areas. [5]

For decades, medical students and trainees have been instructed to obtain a broad and thorough assessment of a patient's health status by conducting a review of systems (ROS) as an integral part of the history-taking process. [6] Despite the prevalence of general health checks, questions persist about their value, goals, effective components and consequences. Some individuals advocate transforming these assessments into "annual health reviews" aimed at fostering trust and therapeutic doctor-patient relationships, while others advise against conducting yearly comprehensive health examinations for asymptomatic adults. [7]

According to the Canadian Task Force on Preventive Health Care, the traditional annual physical examination of asymptomatic adults is not supported by evidence of effectiveness and might result in harm. [8] Findings from a study [9] revealed that while we cannot be certain that screening leads to benefit, all medical interventions can lead to harm. Overdiagnosis, exemplified by identifying latent cancers or carcinoma in situ that may not progress, illustrates this risk. False-positive test results can lead to unnecessary invasive procedures and drug treatment for risk factors may have adverse effects. Positive results may induce unwarranted worry, while false negatives can create a false sense of security, delaying necessary medical attention. Additionally, labeling individuals as having a disease or being at increased risk can negatively impact their self-perception. Finally, there is a financial cost associated with identifying and treating risks and diseases that might never have affected health or longevity. [9] Present evidence suggests that a more cost-effective approach lies in scheduling periodic preventive visits with a primary care health professional based on individual risks and specific testing schedules to provide preventive counseling, immunizations, and known effective screening tests. [8]

Practicing preventive medicine can also lower costs, as 75% of the United States' annual health spending goes toward chronic and largely preventable diseases. To provide preventive services in primary care, there is a need for fresh funding within the healthcare system, which

could potentially be sourced from redirected billing previously designated for annual physical examinations. [1]

Face-to-face time between primary care providers and patients is invaluable and should be utilized effectively to enhance patient's health. [10] This includes fostering relationships that facilitate care and enhance better future outcomes. [11] By using the recommendations of the US Preventive Services Task Force (USPSTF) as a reference, healthcare professionals should provide and document services that are based on evidence rather than in traditional or reimbursement-driven approaches. The USPSTF assesses both the benefits and potential harms, recommending services that demonstrate a net benefit, particularly those with a moderate or higher level of net benefit (A and B recommendations). [10]

In medical education, the prevailing notion that actively intervening in a problem is usually the right approach, is deeply ingrained from an early stage, leaving limited space for discussion about unnecessary interventions and downplaying the significance of quaternary prevention. [12] Therefore, it is essential to have a debate about overdiagnosis and overtreatment, always keeping in mind the enablement and empowerment of patients. [13,14] Only then will it be possible to reduce unnecessary medical workload and, above all, improve the patient's quality of life.

Şahin M. [15], in Turkey, and Pietrzyk Ł. [16], in Poland, highlight deficiencies in the knowledge of healthcare professionals and medical students concerning colorectal cancer screening. Cynthia [17], in Mexico, reports similar issues among medical students and interns for various cancer screenings. In Portugal, Rodrigues [18], in a study involving medical students in their 3rd and 6th years at FMUC in 2017, points out disparities concerning recommendations and underscores the importance of discussing quaternary prevention during the course. Peixoto [19] conducted an observational and cross-sectional study with students in the 4th, 5th, and 6th years at FMUC in 2022, which indicated satisfactory knowledge of Preventive Medicine, showing improvement over the clinical years. However, there was less consensus when considering the recommended intervals for intervention repetition. Accordingly, one can deduce the paramount importance of instilling core concepts of Preventive Medicine in the educational path of each future medical practitioner, highlighting the existing gap in knowledge about this subject among medical students in Portugal.

This study aimed to analyze whether the preventive knowledge of the 6th-year medical students at the Faculty of Medicine of the University of Coimbra (FMUC) was aligned with the most current recommendations, when it was performed in September and October 2023. It also aimed to study the student's perspective regarding the benefits of routine appointments and explore gender differences across the various components under investigation.

2. METHODS

An inquiry was made to investigate the level of agreement among 6th-year students at FMUC with current recommendations when faced with a hypothetical patient aged 50 to 65 years in a routine medical consultation (Attachment I). A cross-sectional observational study in a convenience sample of 6th-year students from the Integrated Master's in Medicine program at the Faculty of Medicine of the University of Coimbra, in September and October 2023 was performed.

The patient presented to the students had no risk factors or relevant medical history and had not undergone any previous surgical procedures. The students were asked which of the following preventive interventions they would perform: calculate the Body Mass Index (BMI), measure waist circumference, listen to the heart and lungs sounds, conduct a complete physical examination, inquire about dietary habits, alcohol consumption and its amount, practice of physical activity and its amount and regularity, smoking habits, anxiety and depressive symptoms as well as interest in practicing preferred activities and check vaccination status.

The question 'Of the following tests, which ones do you think should be requested and how often when they have normal values?' was asked regarding various preventive procedures, such as measurement of serum cholesterol levels, blood glucose test, posterior-anterior chest X-ray, urinalysis and electrocardiogram.

They were also inquired about the recommendations they believed were essential for women, which included breast cancer screening with mammography, as suggested by the Portuguese League Against Cancer, keeping regular cervical cytology test (Pap Screen) and colorectal cancer screening. The same applied to men, with questions regarding to colorectal cancer screening and prostate cancer screening based on age.

The USPSTF recommendations [20] and the guidelines for population-based cancer screenings carried out within the Portuguese National Health Service (NHS) [21] were taken into account as references. The USPSTF recommendations were arbitrarily chosen among other recommendations.

Finally, the advantages of regular check-up appointments were also asked.

The sample size was calculated based on the total number of 6th-year students (312) and using the online tool "surveysystem.com" for a 95% confidence interval and a 6% margin of error as of n=144 students.

2.1. Data collection and analysis:

Students were invited to participate in the study by completing the inquiry distributed online using the 6th year FMUC student's social networks. It was explicitly stated on the first page of the questionnaire that participation would be both anonymous and voluntary, and participants had the freedom to withdraw at any point. The protocol was approved by the Ethics Committee of the Faculty of Medicine of the University of Coimbra (Attachment II).

Data analysis was conducted using the Windows 25th version of the Statistical Package for the Social Sciences (SPSS) software, using descriptive and the non-parametric Mann-Whitney U test, for differences according to students' sex.

3. RESULTS

3.1. Sample characterization

A sample of n=144 students, 108 (75,0%) female was studied, representing 46,2% of the universe of 6th year medical students.

3.2. Analysis of the frequency of answers according to sex

Table 1 shows the results according to sex for the studied variables. The answer following the best evidence according to the USPSTF and Portuguese National Health Service (NHS) is highlighted in bold. A significant difference was found for weight and height measure, females more stating it.

It is evident that most students responded affirmatively to all the aspects examined, with varying degrees of unanimity. This includes measuring height and weight, where 93.8% of responses were correct; measuring abdominal circumference, with a 75% accuracy rate; confirming vaccination status, which had 84.7% correct responses; asking about dietary habits, with 93.8% of responses being accurate; inquiring about alcohol consumption, including quantity, with a 97.2% accuracy rate; asking about physical activity, including frequency and duration, with 97.9% correct responses; questioning about smoke habits or smoking history in the last 15 years, with a 99.3% accuracy; inquiring about feelings of anxiety or worry, with a 76.4% correctness rate; and finally, asking about their interest in preferred activities and feelings of depression, with a 75.0% accuracy level. On the other hand, when asked about conducting a thorough physical examination, only 43.1% answered correctly.

Table 1 - Descriptive analysis of direct response variables according to sex

		Yes n (%)	No n (%)	p (Mann-Whitney U)
Weight and height measure	Feminine	104 (96,3)	4 (3,7)	0,029
	Masculine	31 (86,1)	5 (13,9)	
	Total	135 (93,8)	9 (6,3)	
Abdominal circumference measure	Feminine	83 (76,9)	25 (23,1)	0,376
	Masculine	25 (69,4)	11 (30,6)	
	Total	108 (75,0)	36 (25,0)	
Cardiac and pulmonary auscultation	Feminine	99 (91,7)	9 (8,3)	0,158
	Masculine	30 (83,3)	6 (16,7)	
	Total	129 (89,6)	15 (10,4)	

Perform a complete physical examination	Feminine	62 (57,4)	46 (42,6)	0,846
	Masculine	20 (55,6)	16 (44,4)	
	Total	82 (56,9)	62 (43,1)	
Check the vaccination report	Feminine	93 (86,1)	15 (13,9)	0,424
	Masculine	29 (80,6)	7 (19,4)	
	Total	122 (84,7)	22 (15,3)	
Ask about their diet	Feminine	99 (91,7)	9 (8,3)	0,075
	Masculine	36 (100)	0 (0,0)	
	Total	135 (93,8)	9 (6,3)	
Inquire about their alcohol consumption and quantity	Feminine	105 (97,2)	3 (2,8)	1,000
	Masculine	35 (97,2)	1 (2,8)	
	Total	140 (97,2)	4 (2,8)	
Ask about physical activity (number of times per week and duration)	Feminine	105 (97,2)	3 (2,8)	0,314
	Masculine	36 (100,0)	0 (0,0)	
	Total	141 (97,9)	3 (2,1)	
Ask if they are a smoker or have been in the last 15 years	Feminine	107 (99,1)	1 (0,9)	0,564
	Masculine	36 (100,0)	0 (0,0)	
	Total	143 (99,3)	1 (0,7)	
Inquire about any feelings of anxiety or worry	Feminine	81 (75,0)	27 (25,0)	0,498
	Masculine	29 (80,6)	7 (19,4)	
	Total	110 (76,4)	34 (23,6)	
Inquire about their engagement in activities or any feelings of depression	Feminine	78 (72,2)	30 (27,8)	0,184
	Masculine	30 (83,3)	6 (16,7)	
	Total	108 (75,0)	36 (25,0)	

3.3. Analysis of periodicity of exams according to sex

Table 2 presents the findings regarding how often students believe preventive tests should be conducted. A significant difference was found for electrocardiogram ($p=0,023$) and chest X-ray ($p=0,013$), suggesting that females would request these two exams less often.

It's worth highlighting that 70.8% of students (75.9% of girls and 55.6% of boys) made the correct choice by not requesting routine electrocardiograms. Similarly, 91.0% of students (94.4% of girls and 80.6% of boys) would also refrain from ordering routine chest X-ray, aligning with current evidence. The majority (64.6% of students) also answered correctly by opting not

to request a routine urine analysis and 66.0% decided to request a lipid profile once a year. Regarding blood glucose test, we cannot deem any response correct or incorrect since the clinical case does not provide information about the body mass index of the patient in question.

Table 2 - Descriptive analysis of the periodicity of preventive exams with evidence of indication, based on students' sex.

		Don't request n (%)	Once a year n (%)	Every two years n (%)	p (Mann-Whitney U)
Electrocardiogram	Feminine	82 (75,9)	11 (10,2)	15 (13,9)	0,023
	Masculine	20 (55,6)	7 (19,4)	9 (25,0)	
	Total	102 (70,8)	18 (12,5)	24 (16,7)	
Chest X-Ray	Feminine	102 (94,4)	1 (0,9)	5 (4,6)	0,013
	Masculine	29 (80,6)	2 (5,6)	5 (13,9)	
	Total	131 (91,0)	3 (2,1)	10 (6,9)	
Urinalysis	Feminine	72 (66,7)	29 (26,9)	7 (6,5)	0,320
	Masculine	21 (58,3)	11 (30,6)	4 (11,1)	
	Total	93 (64,6)	40 (27,8)	11 (7,6)	
Lipid profile	Feminine	15 (13,9)	71 (65,7)	22 (20,4)	0,563
	Masculine	6 (16,7)	24 (66,7)	6 (16,7)	
	Total	21 (14,6)	95 (66,0)	28 (19,4)	
Blood glucose test	Feminine	17 (15,7)	69 (63,9)	22 (20,4)	0,670
	Masculine	5 (13,9)	26 (72,2)	5 (13,9)	
	Total	22 (15,3)	95 (66,0)	27 (18,8)	

3.4. Analysis of screening exams, according to sex

Table 3 presents the result by sex for screening exams deemed necessary for individuals aged 50 to 65 with no personal or family medical history, entirely asymptomatic and not routinely attending clinical appointments with the Family Physician.

Concerning a woman, a large majority (93.8% of students) correctly recommended a mammography; 75.7% also gave the right response by suggesting cervical cytology and 85.4% were accurate in suggesting fecal occult blood test. In the case of men, 88.2% correctly recommended fecal occult blood test, but 71.5% responded suggesting the PSA test.

No significant differences were observed between student's gender regarding the preventive exams to council, nevertheless females showing greater prevalence than males in the "no" answer, except for Prostate-specific antigen (PSA) test.

Table 3 - Frequency of responses, by sex, regarding recommended screening exams for women and men aged 50 to 65

Patient gender	Exam	Student gender	Student answer		p
			Yes n (%)	No n (%)	
Female	Mammography	Feminine	101 (93,5)	7 (6,5)	0,843
		Masculine	34 (94,4)	2 (5,6)	
		Total	135 (93,8)	9 (6,3)	
	Cervical cytology	Feminine	81 (75,0)	27 (25,0)	0,737
		Masculine	28 (77,8)	8 (22,2)	
		Total	109 (75,7)	35 (24,3)	
	Fecal occult blood test (FOBT)	Feminine	92 (85,2)	16 (14,8)	0,892
		Masculine	31 (86,1)	5 (13,9)	
		Total	123 (85,4)	21 (14,6)	
Male	Prostate-specific antigen (PSA) test	Feminine	81 (75,0)	27 (25,0)	0,111
		Masculine	22 (61,1)	14 (38,9)	
		Total	103 (71,5)	41 (28,5)	
	Fecal occult blood test (FOBT)	Feminine	95 (88,0)	13 (12,0)	0,882
		Masculine	32 (88,9)	4 (11,1)	
		Total	127 (88,2)	17 (11,8)	

3.5. Analysis of the advantages of periodic health evaluations, stratified by sex

Table 4 reveals the non-significant differences between sexes, for the perspectives on the short, medium, and long-term benefits of periodic health evaluations on impact on disease identification and prevention.

For the majority of students (70.8%), there was the belief that regular general health checkups result in more early diagnoses. A significant percentage (85.4%) thought these checkups moderately improve the control of risk factors and a considerable portion (59.7%) believed they contribute to increased utilization of preventive clinical services. However, when it comes to the impact on quality of life, only 40.3% considered it significant. Similarly, only 31.9% agreed that these periodic health evaluations lead to a reduction in cardiovascular risk and just 41.7% acknowledged an increase in the detection of chronic diseases.

Table 4 - Descriptive analysis of the benefits of periodic health evaluations

		Yes n (%)	No n (%)	p (Mann- Whitney U)
Increase incidence of early diagnoses	Feminine	73 (67,6)	35 (32,4)	0,140
	Masculine	29 (80,6)	7 (19,4)	
	Total	102 (70,8)	42 (29,2)	
Enhance identification of chronic diseases	Feminine	42 (38,9)	66 (61,1)	0,243
	Masculine	18 (50,0)	18 (50,0)	
	Total	60 (41,7)	84 (58,3)	
Reduce cardiovascular risk	Feminine	32 (29,6)	76 (70,4)	0,304
	Masculine	14 (38,9)	22 (61,1)	
	Total	46 (31,9)	98 (68,1)	
Moderate improvement in risk factor control	Feminine	91 (84,3)	17 (15,7)	0,497
	Masculine	32 (88,9)	4 (11,1)	
	Total	123 (85,4)	21 (14,6)	
Increase utilization of preventive clinical services	Feminine	67 (62,0)	41 (38,0)	0,328
	Masculine	19 (52,8)	17 (47,2)	
	Total	86 (59,7)	58 (40,3)	
Enhance quality of life	Feminine	46 (42,6)	62 (57,4)	0,328
	Masculine	12 (33,3)	24 (66,7)	
	Total	58 (40,3)	86 (59,7)	

4. DISCUSSION

The main goal of this study was to analyze the knowledge regarding preventive interventions among medical students at FMUC, based on their levels of agreement with the recommendations of the USPSTF and Portuguese National Health Service's guidelines (NHS), at the time of the questioning, September and October 2023. Furthermore, it aimed to explore knowledge differences between student's sexes.

4.1. Direct response variables

A strong student's agreement to current evidence concerning decisions about interventions during a routine consultation was revealed: weight and measure height (Grade B), obtain waist circumference (recent evidence suggests that waist circumference may be an acceptable alternative to BMI measurement in some patient subpopulations), verify vaccination status, inquire about dietary and alcohol consumption, including quantities (Grade B), ask about physical activity, ask about tobacco habits or recent smoking history within the last 15 years (Grade A), inquire about feelings of anxiety or worry (Grade B) and also inquire about feelings of depression or loss of interest in daily activities (Grade B).

The results are consistent with those found in the study conducted in 2022 [19] among 6th-year FMUC students, showing a strong alignment of students' responses with the USPSTF recommendations regarding body mass index calculation and the importance of inquiring about tobacco and alcohol habits.

Anxiety and depression stand out as highly common conditions in the general population. Given their frequent coexistence and the inherent challenges of these mood disorders, it is crucial to explore them during a general and family medicine consultation, as highlighted by the students. However, completing extensive questionnaires becomes a challenge, especially for individuals experiencing fatigue or difficulty concentrating. [22] A study in a thesis of the integrated master's program in Medicine [23] demonstrated that PHQ-4 scale, initially validated in English, was proved to be a valid and reliable screening tool in assessing, in a timely and effortless way, anxiety, depression and distress as indicators of mental health.

While 89,6% of students believe in the importance of listening to heart and lung sounds, it's noteworthy that there isn't a clear Grade A or B recommendation for it, remaining indeterminate. Conversely, 56,9% of students view a complete physical examination as essential. Nevertheless, current evidence does not support practices such as pelvic and testicular examinations for cancer diagnosis, abdominal palpation for pancreatic cancer and thyroid examination for thyroid cancer, all receiving a Grade D designation.

Females achieved statistically significant better outcomes in one aspect (weight and height measure). This holds significance since the ongoing global obesity epidemic,

predominantly reliant on body mass index (BMI) data, persistently advances and currently impacts over 2 billion individuals. [24]

4.2. Periodicity of preventive exams with evidence of indication

For preventive exams schedule and their frequency, students followed the latest evidence for electrocardiogram, chest X-ray and urinalysis. The majority would not request an electrocardiogram (Grade D), would not request a Chest X-ray (annual lung cancer screening is performed with low-dose chest CT, not X-ray, in adults aged 50 to 80 with a history of 20 pack-years of smoking who currently smoke or have quit within the last 15 years - Grade B) and would not request a urinalysis (Grade D). Moreover, 66.0% indicated a preference for an annual lipid panel, which is controversial because while recommendations suggest screening the lipid profile for men aged ≥ 40 years and women aged ≥ 50 years or postmenopausal without identified cardiovascular risk factors or known cardiovascular disease, this evidence is categorized as Level C. [25]

Compared to the 2022 study [19], where students strongly supported recommendations, especially regarding the non-routine use of urinalysis and electrocardiogram, as well as the ordering of a lipid profile, we can infer that the knowledge level regarding these exams remains robust.

Nevertheless, 66.0% would additionally request a blood glucose test annually, while 18.8% would opt for it every two years. According to current evidence, screening for prediabetes and type 2 diabetes in adults aged 35 to 70 is recommended every three years for individuals with overweight or obesity (Grade B). Given that the clinical case did not provide information on the patient's body mass index, a definitive statement regarding the necessity of the blood glucose test cannot be made.

As indicated by the investigation conducted by Martins C. et al. [26], Portuguese family physicians exhibit a notable concordance with the recommendations of the USPSTF. Nevertheless, a decline in concordance becomes apparent when accounting for the recommended frequency of interventions. Within the scope of this study, students demonstrated proficiency in selecting relevant tests and determining their optimal scheduling. This suggests an advancement in educational effectiveness concerning preventive screenings.

Females showed significant better results in two components, probably by being more meticulous in requesting examinations than males.

Even with the increasing reliance on evidence-based medicine to assess clinical decisions, the available evidence may not always be sufficient or may not lean in a singular direction. Consequently, there is a call for current education to encourage medical students to actively seek, evaluate, interpret, and apply relevant evidence for patients, enhancing their role in disease prevention. [5]

4.3. Recommended screening exams

The optimistic expectations surrounding the early detection of cancer through screening, which was believed to enhance life expectancy, has become a subject of growing controversy. [14] Study results indicated that students exhibit satisfactory agreement with the USPSTF recommendations regarding screening exams, with the majority opting for mammography (Grade B), cervical cytology (Grade A), and fecal occult blood testing (Grade A).

Patell [27], in an American study conducted with 586 physicians in various specialties during their internship in 2019, reports that 68% of the doctors answered correctly regarding screening questions for colorectal cancer. Our data aligns with a similar pattern.

Regarding PSA-based screening for prostate cancer, most students chose to undergo testing. However, the decision should be individualized. While screening offers a small potential benefit in reducing the chance of death from prostate cancer, it comes with potential harms from “false-positive results”, overdiagnosis, overtreatment, and treatment complications being a possible out-come. The appropriateness of screening should be determined on a case-by-case basis, taking into account factors like family history, race/ethnicity, existing medical conditions, patient values, and other health needs (Grade C).

The authors of an article titled “The Future of Cancer Screening-Guided Without Conflicts of Interest” [14] defend that the acknowledgment of uncertain benefits, increasing concerns about overdiagnosis, and the realization of the harms associated with false-positive screening tests and the burdens of subsequent therapeutic procedures have turned cancer screening into a polarized domain within modern medicine. Early detection tests like mammography and PSA testing focus on identifying cancer early to reduce the risk of death. However, they don't lower the risk of developing cancer and may lead to overdiagnosis. Conversely, preventive cancer screening, exemplified by the Papanicolaou test, aims to prevent cancer by removing benign precursors, reducing both cancer incidence and mortality. Preventive screening holds more appeal than early detection, as it aligns with primary prevention through lifestyle changes. Most individuals would likely prefer a screening test preventing cancer over one detecting it early. Despite these distinctions, stakeholders often endorse both concepts without clarifying, potentially causing misunderstandings among patients and decision-makers. [14]

4.4. Benefits of periodic health evaluations

In accordance with the review “General Health Checks in Adult Primary Care” [7], by the American Medical Association, general health checks exhibited no correlation with reduced mortality or cardiovascular events. Nevertheless, they demonstrated associations with heightened recognition and treatment of chronic diseases, improved control of risk factors,

increased uptake of preventive services and enhanced patient-reported outcomes. Thus, students align with existing evidence regarding the positive impact of periodic health evaluations on moderate improvement in risk factor control and increased utilization of preventive clinical services, as well as the fact that it has no impact on reducing cardiovascular risk. However, students believe there is no influence on the increase in chronic disease detection or the improvement of quality of life, which contradicts current evidence.

Richard Van Mellaerts [28], the deputy chair of the BMA GPs committee in England and a GP partner in Kingston Upon Thames, challenges the government to consider the positive outcomes our family physician could achieve if they weren't consumed by the time-consuming task of submitting data that often goes unnoticed. He also asks to imagine the positive impact on patients when their care is prioritized over bureaucratic checkboxes for the government and to envision general practitioners who are genuinely content at work, able to leave on time, without contemplating an exit strategy because the current situation wasn't what they originally signed up for. He defends that by eliminating burdensome micro-targets that distort the quality of care and neglect the patient as a human being, we can enhance our ability to prioritize patient well-being.

4.5. Study limitations

The use of an online survey introduces the possibility of responses influenced by external sources, which couldn't be controlled. It is essential to acknowledge that our sample is confined to a singular Portuguese medical school, however the study's data provide valuable insights into the knowledge of 6th-year FMUC students, highlighting areas needing improvement and contributing for the refinement of Preventive Medicine teaching methodologies and teaching, in an area that is ever being up-dated.

Future researches must expand this study to other Portuguese medical schools, aiming for a more comprehensive understanding of medical students' knowledge in Portugal. Comparing these findings with international universities using diverse teaching methods will offer insights into the most effective ways to teach Preventive Medicine. This approach has the potential to enrich the educational landscape of this fundamental area of Medicine.

5. CONCLUSION

The 6th-year medical students at FMUC showed solid knowledge of Preventive Medicine, female students revealing more appropriate exams requesting.

The students showed a strong understanding of the interventions needed in routine consultations, although their proficiency was lower when it came to conducting a thorough physical examination. They exhibited excellent knowledge of preventive exams and their recommended frequency, as well as screening exams, excluding PSA testing, which needs to be further explored during classes. The students performed less satisfactorily when asked about the benefits of routine consultations, indicating a lack of awareness regarding the effectiveness and value of periodic preventive visits compared to annual routine check-ups.

This implies a potential for enhancement in medical training, specifically focusing on the delicate balance between the advantages of routine exams and the drawbacks of overdiagnosis, which goal is to allocate valuable consultation time to delivering established preventive services and engaging in shared decision-making. This ensures that patient preferences and the most reliable evidence play a crucial role in decision-making.

ACKNOWLEDGEMENTS

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ATTACHMENTS

Attachment I - Online survey conducted among 6th-year students at the Faculty of Medicine of the University of Coimbra, in September and October 2023.

29/06/2023, 00:26

IMPACTO DE UM MODELO PERSONALIZADO E BASEADO NA EVIDÊNCIA, NA MELHORIA DOS CUIDADOS PREVEN...

IMPACTO DE UM MODELO PERSONALIZADO E BASEADO NA EVIDÊNCIA, NA MELHORIA DOS CUIDADOS PREVENTIVOS: IMPACTO NA FORMAÇÃO DE ESTUDANTES DE MEDICINA

Caro aluno/ aluna:

O tempo de contacto pessoal entre os médicos dos cuidados de saúde primários, nomeadamente os de Medicina Geral e Familiar e os pacientes em consulta é precioso e deve ser aproveitado da forma mais eficaz com vista a promover uma boa relação médico-doente e uma tomada de decisões partilhada e baseada na evidência, promovendo melhores resultados no domínio da saúde.

É convidado a participar num estudo sobre a alteração do uso do sistema ROS (análise de revisão de órgãos por sistemas) para um de cuidados mais baseados na evidência com prestação de serviços preventivos comprovados, incluindo aconselhamento comportamental, avaliando a forma mais eficaz de otimizar o tempo de uma consulta de Medicina Geral e

Familiar.

Se aceitar, solicita-se que responda a um conjunto de perguntas. O tempo total de preenchimento é de 5 minutos.

É garantida confidencialidade, anonimato e sigilo quanto à informação obtida. Não há respostas certas ou erradas, o que

interessa é que responda de forma honesta sobre os itens perguntados. Não há qualquer remuneração em troca, nem qualquer dano ou inconveniente por não querer responder ou cessar a resposta quando queira.

Se tiver questões sobre este estudo, desejar retirar o consentimento dado ou tiver qualquer outra questão deve contactar

o investigador responsável: Andreia Leão Pipa Mascarenhas Loureiro (andreialeaopipa@gmail.com).

Ao carregar no botão de concordo, terá acesso ao questionário.

* Indica uma pergunta obrigatória

1. Declaro ter lido, compreendido e recebido a informação necessária, estou esclarecido e *
aceito participar voluntariamente no estudo:

Marcar apenas uma oval.

- Aceito Participar no Estudo *Avançar para a pergunta 2*
- Não Aceito Participar no Estudo

2. Em anonimato, indique o seu sexo *

Marcar apenas uma oval.

- Sexo Feminino
- Sexo Masculino
- Não quero responder

Suponha que uma pessoa não assídua na sua consulta, vem ter consigo, não tendo queixas, mas pretendendo fazer um exame de rotina, a que chama de "check-up!". Pense, latamente que ela terá entre os 50 e os 65 anos.

3. Qual ou quais das abaixo julga que lhe devem ser realizadas? *

Marcar tudo o que for aplicável.

- Pesar e saber a altura
- Medir o perímetro abdominal
- Auscultação cardíaca e pulmonar
- Fazer exame físico completo
- Perguntar pelos seus hábitos alimentares
- Perguntar sobre as bebidas que consome e em que quantidade
- Perguntar se faz alguma atividade física, quantas vezes por semana e por quanto tempo
- Perguntar se fuma
- Perguntar se se tem sentido nervoso ou muito preocupado
- Perguntar pelo seu interesse em fazer aquilo que gosta ou se se tem sentido deprimido(a)
- Verificar o seu estado de vacinas

4. Dos seguintes exames, quais são os que pensa que devem ser pedidos e com que regularidade quando apresentam valores normais? *

Marcar apenas uma oval por linha.

	Não pedir	Pedir uma vez por ano	Pedir a cada dois anos
Eletrocardiograma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rx do Tórax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sumária da Urina	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lípidos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PSA (homem)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Glicémia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PSOF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Suponha que uma pessoa não assídua na sua consulta, vem ter consigo, não tendo queixas, mas pretendendo fazer um exame de rotina, a que chama de "check-up!". Pense, latamente que ela terá entre os 50 e os 65 anos.

5. Das recomendações seguintes, qual/quais pensa que devem ser dadas nas senhoras? *

Marcar tudo o que for aplicável.

- Fazer mamografia, segundo o convite da Liga Portuguesa Contra o Cancro
- Fazer citologia do colo do útero regularmente
- Realizar o rastreio do cancro do intestino
- Manter a vacinação atualizada

6. Das recomendações seguintes, qual/quais pensa que devem ser dadas nos **senhores?** *

Marcar tudo o que for aplicável.

- Realizar o rastreio do cancro do intestino
- Realizar rastreio do cancro da próstata segundo a idade
- Manter a vacinação atualizada

7. De quanto em quanto tempo julga que deve ser feita uma consulta de rotina? *

Marcar apenas uma oval.

- Uma vez por ano
- Duas vezes por ano
- De dois em dois anos
- De três em três anos

8. Na sua opinião, qual é o benefício em fazer consultas de “check-up” regularmente? *

Marcar tudo o que for aplicável.

- Maior número de diagnósticos precoces
- Aumento da deteção de doenças crónicas
- Menor risco cardiovascular
- Melhoria moderada no controlo de fatores de risco
- Menor taxa de morbimortalidade
- Melhor Qualidade de vida
- Aumento da utilização de serviços clínicos preventivos

Este conteúdo não foi criado nem aprovado pela Google.

Google Formulários

Attachment II - Approval by the Ethics Committee of the Faculty of Medicine of the University of Coimbra

Envio parecer CE_Proc. CE-098/2023_Andreia Loureiro > Caixa de entrada x



 **Comissão Ética - FMUC** <comissaoetica@fmed.uc.pt> quinta, 19/10/2023, 15:43 ★ 😊 ↩ ⋮
para mim, lmsantiago, inesrcs ▾

Exma. Senhora
Dra. Andreia Leão Pipa Mascarenhas Loureiro,

Cumpre-nos informar que o projeto de investigação apresentado por V. Exa. com o título *"Impacto de um modelo personalizado e baseado na evidência, na melhoria dos cuidados preventivos: impacto na formação de estudantes de medicina"*, foi analisado na reunião da Comissão de Ética da FMUC de 12 de outubro, tendo merecido o parecer que a seguir se transcreve:

"Correção recebida e aceite. O parecer favorável já tinha sido emitido, pelo que se encerra o processo administrativo".

Cordiais cumprimentos.

Helena Craveiro
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