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Adolescent medicine: competency matrix for medical graduation

Medicina do adolescente: matriz de competências para a graduação médica

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ABSTRACT

Introduction: The competency-based education aims at the formation of a professional that, in addition to dominating knowledge, possesses the necessary abilities and skills to face complex challenges that will appear in professional life. The present study aims to contribute for the creation of a competency matrix oriented to the Adolescent Medicine during the medical undergraduate course so that the student can, at the end of the course, carry it out with autonomy and safety.

Methodology: The study consists of a quantitative exploratory study, which was carried out in four phases: first a bibliographic survey and the creation of a pilot matrix were made; then a research was performed with specialists (pediatricians and physicians specialized in adolescents); in the third phase, research was done alongside a panel of local judges; and finally, the results were analyzed and the definitive matrix was created. At the end, a matrix proposal composed of 24 essential competencies in Adolescent Medicine was structured upon 3 thematic axis.

Results and discussion: The results allowed us to trace a profile of competencies in accordance with the proposed objective and will permit the fulfillment of an existing gap in professional formation, guaranteeing the training in Adolescent Medicine.

Conclusion: Thus, findings of the present study point out the need to reflect upon the formation of the general practitioner, with the use of a competency matrix.

Keywords: Competency-Based Education. Medical Education. Competency Matrix. Adolescent Medicine.

RESUMO

Introdução: *A educação baseada em competências visa à formação de um indivíduo que, além de dominar os conhecimentos, possua as habilidades e atitudes necessárias para enfrentar os desafios complexos que aparecerão na vida profissional.*

Objetivo: *O presente trabalho teve como objetivo contribuir para a criação de uma matriz de competência para o ensino da medicina do adolescente durante a graduação médica, a fim de que o egresso possa, ao final do curso, executá-la com autonomia e segurança.*

Método: *O trabalho consiste num estudo exploratório quantitativo efetuado em quatro fases: 1. realizaram-se o levantamento bibliográfico e a criação da matriz-piloto; 2. fez-se uma pesquisa com especialistas (pediatras e médicos de adolescentes); 3. participou da pesquisa uma banca de juízes locais; 4. analisaram-se os resultados e elaborou-se a matriz definitiva. Ao final, foi proposta uma matriz composta por 24 competências essenciais em medicina do adolescente estruturada sobre três eixos temáticos.*

Resultado: *Os resultados permitiram traçar um perfil de competências de acordo com o objetivo proposto e possibilitarão preencher uma lacuna existente na formação profissional, garantindo um treinamento em medicina do adolescente.*

Conclusão: *Os achados deste estudo apontam para a necessidade de se refletir sobre a formação do médico generalista com a utilização de uma matriz de competências.*

Palavras-chave: *Educação Baseada em Competências; Educação Médica; Matriz de Competências; Medicina do Adolescente.*

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INTRODUCTION

Competency-based medical education has been discussed and studied worldwide with the aim of promoting excellent medical education. The development of competencies is the structuring axis within medical education, which guides the contents, strategies and evaluation processes. It would be a set of cognitive, technical, integrative (comprehensive health care), affective-moral, interpersonal relationship and professionalism domains. Each domain consists of several milestones that the undergraduate student is obliged to master at the end of their education[1,2,3].

Competence is defined as the ability to mobilize knowledge, skills, and attitudes necessary to deal with real-life situations, dilemmas, and problems. According to Perrenoud (1999)[4], the development of competencies requires an active and reflective environment that induces the practice of placing the student in an active position in their learning process based on coping with problem situations.

Adolescent Medicine has been recognized as an area of expertise in Pediatrics since 1999 by the Brazilian Medical Association (AMB, *Associação Médica Brasileira*). In 2002, a resolution of the National Council of Medical Residency (CNRM, *Conselho Nacional de Residência Médica*) demanded the inclusion of the topic of adolescence as a mandatory part of medical residency programs.

In addition, the care of adolescents is a challenging area, as many pediatric and medical clinic services are not prepared to treat these patients. Although the pediatrician is the professional trained to deal with these demands, the ethical principle of autonomy of patients over 16 years of age must be respected and those who they want to treat them.

After consulting several authors, such as Ocampos (2018)[5], the absence of satisfactory answers was observed to questions such as: what can Adolescent Medicine contribute to the training of a general practitioner? What relevance does knowledge on topics related to adolescence have in the practice of a general practitioner? Are competent professionals (generalists) being trained to assist adolescents?

In view of these questions, the purpose of this project was the production of a Matrix of Competencies in Adolescent Medicine, with the objective of mapping the domains (competencies, skills and attitudes) understood as essential to teaching-learning in the context of medical undergraduate course.

METHODOLOGY

This research is an exploratory and quantitative study, inscribed in the area of health education with a focus on the teaching of Medicine. The research site was in the city of Belém, state of Pará, Brazil, in a Private Higher Education Institution. The study was divided into four (4) phases, described below.

First phase:

it consisted of a literature review through Google Scholar, SCIELO and VHL databases, using the exposed keywords. Then, a questionnaire was created divided into 3 thematic axes, with 29 competencies, classified as follows:

I - The adolescent consultation: knowledge, skills and general attitudes - consisting of 9 competencies: 1 - recognition of the adolescent's care; 2 - comprehensive anamnesis, 3 - biopsychosocial characteristics; 4- facilitating strategies for communication; 5- physical examination; 6- anthropometric assessment; 7- monitoring of growth and development, 8- dietary guidance, 9- creation of diagnostic hypotheses;

II - Adolescent health: reproductive health, sexuality and mental and social health - consisting of 16 competencies: 1 - approach to sexuality; 2- knowledge about contraceptive methods; 3- Sexually Transmitted Infections – STI and Acquired Immunodeficiency Syndrome – AIDS; 4- educational actions; 5- teenage pregnancy; 6- identification of situations of sexual violence and risk behavior; 7- promotion of family dialogue; 8- Adolescent Rights; 9- gender issues; 10- mental health; 11- psychosocial risk factors; 12- Habits for a healthy life; 13- use of anabolic steroids; 14- Statute of the Child and Adolescent (ECA); 15- Health protective factors; 16- Mass media – critical attitude;

III - Most frequent problems: general medical knowledge of the main health problems of adolescents - consisting of 4 competencies: 1 - recognize the main general conditions of adolescents; 2- recognize the main endocrine disorders; 3- recognize the main chronic and complex disorders; 4- Recognize the main psychiatric disorders.

To answer the questionnaire, the Likert scale was used, as it is the most commonly used model to measure attitudes and conduct opinion surveys. This scale allows researchers to discover different intensities of opinions. For this study, the 5-point scale was chosen, as follows:

- Very relevant or indispensable = 5 points;
- Relevant = 4 points;
- Neutral = 3 points;
- Not very relevant = 2 points;
- Not relevant or not applicable = 1 point.

Second phase:

An opinion survey was conducted with pediatricians and adolescent physicians. The questionnaire was sent to the Adolescent Medicine Departments of all state affiliates of the Brazilian Society of Pediatrics (SBP, *Sociedade Brasileira de Pediatria*); the Informed Consent Form (ICF) was sent together with the questionnaires, explaining the content of the research and providing instructions for filling them out.

Thirty (30) days after the beginning of the phase, there were only seven (7) responses to the questionnaires, so to increase adherence, weekly intervals were established for sending the questionnaires; it was also sent to WhatsApp groups consisting of local and national pediatricians, requesting that it be sent to other groups of pediatricians, using the Snowball sampling. This type of sampling is useful for studying groups that are difficult for the researcher to access or populations with low incidence, in this case, specialists in adolescent medicine.

After a period of 2 months, 03/27 – 05/27/2023, the second phase of the research was completed with the analysis of the data obtained by the Excel tool. Competencies that did not reach the average of 70% agreement were excluded, and the transcription and analysis of the suggestions received for increase in the remaining competencies were carried out. As a result, forty-three (43) questionnaires were collected at this stage.

Third and fourth phase:

In this phase, the main objective was to evaluate the applicability of the matrix. Now, the evaluation was left to the institution's teachers, who had the following alternatives as an option for judging: - No modification; - Modification OR Exclusion of competence; - Increase/decrease in the complexity of the competence.

In this scenario, the Delphi methodology was applied, which aims to obtain a consensus on certain issues, in addition to ensuring and maintaining the anonymity of the participants and obtaining more honest and bias-free opinions from the experts.

The new questionnaire, now called the Pilot Matrix, was then applied, with 25 competencies to a group consisting of 8 local judges, 4 pediatricians and 4 family and community doctors. It was taken into account whether the professionals were linked to teaching and the institution, and to obligatorily assist adolescents in their daily activities. The questionnaire was sent via WhatsApp and was accompanied by the ICF.

The third phase began on 06/02/2023 and after 5 weeks it was closed, after 2 rounds of the questionnaire, obtaining the consensus of the twenty-four competencies in adolescent medicine.

After the conclusion and analysis of the results, the fourth phase began, which consisted of developing the educational product with the aim of establishing competencies that are minimally necessary for a general practitioner in the care of adolescents.

RESULTS

Table 1 shows the profile of the local judges who answered the questionnaire in the third phase; of the total of 8 responses, 50% were from groups of Pediatricians and 50% were Family and Community Doctors.

Finally, table 2 shows the analysis of the competency matrix by the local judges regarding the applicability of each domain (knowledge, skills and attitudes) for undergraduate medical studies.

Table 1. Profile of local judges.

SPECIALTY		GRADUATION	TEACHING	RECEIVED TRAINING IN AM AT UNDERGRADUATE COURSE
JUDGE 1	PEDIATRICIAN	34	31	NO
JUDGE 2	PEDIATRICIAN	36	33	NO
JUDGE 3	PEDIATRICIAN	26	6	NO
JUDGE 4	PEDIATRICIAN	18	3	YES
JUDGE 5	FCM	10	6	NO
JUDGE 6	FCM	8	4	YES
JUDGE 7	FCM	8	3	NO
JUDGE 8	FCM	5	2	NO

Source: Research Protocols, 2024.

Table 2. Judges' agreement rate regarding the evaluation of the matrix of competencies in Adolescent Medicine for undergraduate medical studies.

Skills	No modification N (%)	Modification N (%)	Exclusion N (%)	Increase N (%)	Reduction N %)
1- Recognize adolescence as a cycle of life, describing its main biopsychosocial characteristics, epidemiological profile, risk situations, vulnerabilities, morbidity and mortality, to see the adolescent in all their aspects.	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)
2- Respect the patient in their uniqueness and individuality. Assume an empathetic, welcoming posture, with the adolescent, promote attentive listening without value judgment.	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)
3- Recognize the rights of adolescents: the legal frameworks, the Statute of the Child and Adolescent, the right to attention and information; understand the service in a differentiated, complete and in-depth way, respecting the ethical and bioethical principles of autonomy, secrecy and confidentiality, and that these issues are discussed with undergraduate students.	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)
4- Recognize situations that require intervention by the protection network such as the Guardianship Council, Child and Youth Court, CRAS.	7 (87,5)	0 (0)	0 (0)	1 (12,5)	0 (0)
5- Carry out a comprehensive, organized anamnesis, considering the clinical, psychological, social and cultural context of the adolescent. Use strategies during the interview to facilitate communication and reduce stress during the consultation.	7 (87,5)	1(12,1)	0(0)	0 (0)	0 (0)
6- Perform the appropriate and focused physical examination, explaining it in advance in an understandable way to reduce and calm down fears, being prudent and recommend, if the adolescent allows, the presence of a third person during the examination.	8 (100)	0 (0)	0(0)	0 (0)	0 (0)
7- Monitor the growth and development of normal adolescents and those with chronic and disabling conditions, including the assessment of pubertal development (Tanner scale), and the filling out of the Adolescent Health Handbook.	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)
8- Assess the nutritional status and provide nutritional guidance to the adolescent.	8 (100)	0 (0)	0 (0)	0(0)	0 (0)
9- Develop the Diagnostic Hypotheses, including main and secondary diagnoses, nutritional diagnosis, vaccine diagnosis, pubertal diagnosis. Indicate and evaluate the main complementary exams according to the age group and clinical condition and, with this, set up a therapeutic plan based on the patient's clinical and social context.	8(100)	0(0)	0(0)	0 (0)	0 (0)
10- Work together with a multidisciplinary team in comprehensive adolescent health care when necessary.	8(100)	0(0)	0(0)	0 (0)	0 (0)
11- Understand the approach to the topic of sexuality according to the age, degree of development and receptiveness of the adolescent, without value judgment.	8 (100)	0(0)	0 (0)	0 (0)	0 (0)
12- Master the guidance of contraceptive methods in adolescence.	7(87,5)	0(0)	0(0)	1 (12,5)	0(0)
13- Discuss about STIs and AIDS; have mastery over care, contagion and guidance on preventive measures.	7(87,5)	1(12,5)	0 (0)	0 (0)	0 (0)

Continue...

Table 2. Continua.

Skills	No modification N (%)	Modification N (%)	Exclusion N (%)	Increase N (%)	Reduction N %)
14- Identify adolescent pregnancy and its particularities, maternal and perinatal risk, diagnosis and follow-up.	6 (75)	1 (12,5)	0 (0)	1(12,5)	0 (0)
15- Identify gender issues (incongruence/dysphoria), recognizing that they are situations that generate bullying, rejection, violence, social isolation and/or psychiatric disorders; provide welcoming and non-judgmental care to the adolescent and the family ensuring physical and emotional well-being, in addition to forwarding the cases for multiprofessional follow-up.	6 (75)	0(0)	0(0)	2(25)	0(0)
16- Identify signs of violence (domestic, sexual, bullying, cyberbullying, sexting). List psychosocial risk factors such as child abuse or neglect, family conflicts, exposure to traumatic events, drop in school performance, end of a romantic relationship, social withdrawal for no apparent reason, aggressiveness. Provide guidance on the dangers of abusive use of screens, gaming disorder, electronic games and challenges over the internet.	8(100)	0 (0)	0 (0)	0 (0)	0 (0)
17- Recognize the specific assessment instruments for mental health such as the EAT Test and the BITE Test (eating disorders), HAD scale (anxiety and depression disorder); CRAFFT/CESARE scale (evaluation of drug use); among others.	6(75)	1(12,5)	0 (0)	0 (0)	1(12,5)
18- Identify signs of depression, suicidal ideation and self-harm	8(100)	0(0)	0(0)	0(0)	0(0)
19- List the factors related to the use of substances by adolescents (alcohol, tobacco, electronic cigarettes, cannabis, other substances). Identify the forms of intervention and treatment.	8(100)	0(0)	0(0)	0(0)	0(0)
20- Stimulate and value the practice of physical exercise and healthy lifestyle habits.	7(87,5)	0(0)	0 (0)	1(12,5)	0 (0)
21-Promote/Stimulate dialogue between parents and children.	7(87,5)	0(0)	0(0)	1 (12,5)	0(0)
22- Participate in educational actions for groups of young people, with residents, preceptors or multiprofessional teams on topics related to adolescent health.	8(100)	0 (0)	0(0)	1 (12,5)	0 (0)
23- Recognize the main health problems that affect adolescents, including: Acne; Infectious diseases; Asthma; Musculoskeletal disorders; Chronic fatigue syndrome; Urinary tract disorders; Pulmonary Disorders; Diseases of the gastrointestinal tract, among others.	6(75)	1(12,5)	0 (0)	0 (0)	1(12,5)
24- Recognize the main conditions that affect the endocrine system of adolescents, including: Disorders of growth and physical development; Early and late puberty; Obesity and metabolic syndrome; Thyroid disorders; among others.	6 (75)	2 (25)	0 (0)	0 (0)	0 (0)
25- Recognize the main neuropsychiatric disorders that affect adolescents such as: Attention Deficit Hyperactivity Disorder, Sleep Disorders; Headaches; Mood Disorders, Anxiety Disorders, Behavioral Disorders; Use and abuse of licit and illicit substances; Eating disorders.	8 (100)	0 (0)	0 (0)	0 (0)	0 (0)

Source: Research protocol, 2024.

After this second cycle of evaluation by the local judges, the data and suggestions received were analyzed. The suggestions received, as shown in Table 3, were modified before being submitted to a new round of the questionnaire.

After this third evaluation cycle, with the attached suggestions, there were no further proposed changes, so the matrix and all competencies reached 100% consensus; With this, the third phase of the research and the creation of the definitive matrix, shown in Chart 1, were concluded.

Table 3. Suggested changes to the Competency Matrix after the 1st round with the local Judges are highlighted in red as shown in the figure below.

COMPETENCIES	ORIGINAL MATRIX	PROPOSED MODIFICATIONS
14	Identify adolescent pregnancy and its particularities, maternal and perinatal risk, diagnosis and follow-up.	Identify adolescent pregnancy and its particularities, maternal and perinatal risk, its diagnosis and guidance on preventive measures.
15	Identify gender issues (incongruence/dysphoria), recognizing than are situations than generate bullying, rejection, violence, social isolation and/or psychiatric disorders; provide welcoming and non-judgmental care to the adolescent and the family, ensuring the physical and emotional well-being.	Identify gender issues (incongruence/dysphoria), recognizing than are situations that generate bullying, rejection, violence, social isolation and or psychiatric disorders; Provide warm and non-judgmental care to the adolescent and the family guaranteeing the physical and emotional well-being, in addition to referring cases for multiprofessional monitoring
17	Recognize specific assessment instruments for mental health such as the EAT Test and the BITE Test (eating disorders), HAD scale (anxiety and depression disorder); CRAFFT/CESARE scale (assessment of drug use) among others.	Recognize specific assessment tools for mental health – students should be aware of the existence of protocols, but they should not be required.
24	Recognize the main conditions that affect the endocrine system of adolescents, including: Disorders of growth and physical development; Early and late puberty; Obesity and metabolic syndrome; Thyroid disorders; among others.	Recognize the main endocrine disorders that affect adolescents, such as: thyroid problems, early and delayed puberty, growth disorders, obesity, metabolic syndrome and increased insulin resistance; and know how to triage and refer for follow-up with a multiprofessional team or Specilaists.
25	Recognize the main neuropsychiatric disorders that affect adolescents, such as: attention deficit/hyperactivity disorder, sleep disorders, headaches, mood disorders, anxiety disorders, behavioral disorders, use and abuse of legal and illegal substances, and eating disorders	Recognize the main psychiatric disorders that affect adolescents such as: behavioral disorders, ADHD, mood disorders, anxiety disorders, eating disorders (bulimia and anorexia); Psychosis, suicide and self-injury, risk behaviors; recognize specific instruments/protocols of evaluation for mental health; and refer for treatment with Multiprofessional Teams

Source: Research protocol, 2024.

Chart 1. Matrix of Competencies in Adolescent Medicine for Medical Graduation; Belém/PA, 2024.

Domains	C	H	A
I-Adolescent Consultation			
1-Recognize adolescence as a stage of life, describing its main biopsychosocial characteristics, epidemiological profile, risk situations, vulnerabilities, and viewing the adolescent in all their aspects.	C		
2-Respect the adolescent in their uniqueness and individuality. Adopt an empathetic, welcoming attitude, promoting attentive listening without judgment.	C	H	A
3-Recognize adolescent rights: legal frameworks such as the ECA – Child and Adolescent Statute; the right to care and information; understand the care in a differentiated, complete and in-depth way, respecting ethical and bioethical principles of autonomy, confidentiality, and privacy. These issues should be discussed with students during their undergraduate training.	C		
4-Recognize situations that require intervention by the protection network, such as the Guardianship Council, Social Assistance Centers (CRAS), and the Juvenile Court.	C		
5- Conduct a comprehensive and organized anamnesis, considering the adolescent's clinical, psychological, social, and cultural context. Use strategies during the consultation to facilitate communication and reduce stress.	C	H	A

Continua...

Quadro 1. Continuação.

Domains	C	H	A
I-Adolescent Consultation			
6-Perform an appropriate and focused physical examination, explaining it beforehand in a comprehensible manner to reduce and ease fears, being prudent and recommending the presence of a third person during the examination if the adolescent consents.	C	H	
7-Monitor physical growth and development of both healthy and chronically ill adolescents, including pubertal development assessment (Tanner scale) and completion of the Adolescent Health Record.	C	H	
8-Assess nutritional status and provide nutritional guidance for the adolescent.	C	H	
9- Develop diagnostic hypotheses, including primary and secondary diagnoses, nutritional diagnosis, vaccination diagnosis, and pubertal diagnosis. Request and assess relevant complementary exams based on age and clinical condition, and construct a therapeutic plan based on the patient's clinical and social context.	C	H	
10-Work collaboratively with a multidisciplinary team in providing comprehensive health care to adolescents when necessary.	C	H	A
11-Participate in educational actions for youth groups, alongside residents, preceptors, or the multidisciplinary team on topics related to Adolescent Health.	C	H	A
II-SAÚDE DO ADOLESCENTE – COMPETÊNCIAS ESPECÍFICAS			
12-Understand how to approach the topic of sexuality according to the adolescent's age, developmental stage, and receptivity, without judgment.	C	H	A
13-Describe STIs and AIDS: master the care, transmission, and guidance on preventive and therapeutic measures; recognize biological and psychosocial risks of STIs in adolescence.	C	H	A
14- Master guidance on contraceptive methods in adolescence; recognize the risk factors of each method according to the adolescent's situation, and their level of knowledge, thoughts and feelings regarding reproductive health and pregnancy.	C	H	A
15- Identify pregnancy in adolescence and its particularities, maternal and perinatal risks, diagnosis, and guidance on preventive measures.	C	H	
16-Identify during care situations involving gender issues (incongruence and dysphoria), recognizing that they generate bullying, rejection, violence, social isolation, psychiatric disorders; provide welcoming, non-judgmental care to the adolescent and their family, and refer to multiprofessional follow-up.	C	H	A
17- List the factors related to substance use by adolescents (alcohol, tobacco, electronic cigarettes, cannabis, and other substances). Identify forms of intervention and treatment.	C	H	
18- Identify signs of violence (domestic, sexual, bullying, cyberbullying). List psychosocial risk factors such as child abuse and neglect, family conflicts, exposure to traumatic events, academic decline, unexplained social withdrawal, and aggression. Provide guidance on the risks of excessive screen use, gaming disorder, electronic games, and internet challenges.	C	H	
19-Identify signs of depression, suicidal ideation, and self-harm..	C	H	
20- Promote dialogue between parents and children and understand the role of family inclusion in promoting adolescent health.	C	H	
21-Recognize specific assessment tools for mental health .	C		
III-MOST COMMON PROBLEMS: GENERAL MEDICAL KNOWLEDGE OF MAIN ADOLESCENT HEALTH CONDITIONS.			
22-Recognize and manage the most prevalent adolescent health issues such as acne; infectious-parasitic diseases; headaches and migraines, asthma, rhinitis, menstrual disorders in adolescence; and musculoskeletal problems.	C	H	A
23- Recognize the main endocrine disorders affecting adolescents such as: thyroid problems, precocious puberty and constitutional delay of puberty, growth disorders, obesity, metabolic syndrome, and insulin resistance; and refer for follow-up with a multidisciplinary team or specialist.	C	H	A
24-Recognize major psychiatric disorders affecting adolescents such as: behavioral disorders, ADHD, mood disorders, anxiety disorders, eating disorders (anorexia and bulimia), psychosis, and use of alcohol and other drugs; recognize specific instruments/protocols of evaluation for mental health and refer for treatment with multidisciplinary teams.	C	H	A

Source : Research protocol.

DISCUSSION

Medical education is undergoing criticism regarding teaching content and methods, as exposed by Freitas et. al. (2018)[6], since the curricula of medical courses, guided by the DCN, advocate that medical education be based on the health demands of the community, encompassing a holistic view and ethical, technical, and scientific training.

Thus, within the topic addressed in this article, the construction of a Matrix of Competencies in Adolescent Medicine during medical training will help to outline the

competencies that must be developed to adequately treat the health of adolescents, such as communication skills, empathy and knowledge about mental health and sexuality issues.

In view of this, we can analyze that 100% of the responses received from the physicians participating in the research consider that the construction of a matrix of competencies in Adolescent Medicine is important for the training of a general practitioner, since it can improve health care, both in the general and preventive aspects for this age group; this is in agreement with all the researched sources.

However, although adolescence is considered the healthiest phase of life of the human being, it is a period of extreme vulnerability, due to physical, psychological and social changes. Therefore, the great concern stems from the fact that the cause of morbidity and mortality in this age group is not directly related to biological problems, but rather linked to social, emotional and behavioral factors, which are the main risk factors and can be prevented at the primary level, as long as they are quickly identified.

In addition, the main problems observed are teenage pregnancy, the consumption of licit or illicit drugs, the increase in the incidence of STIs/AIDS, and the increase in the number of deaths from external causes such as traffic accidents, violence, suicide, anxiety and depression disorders, eating disorders, and disorders in growth and development are among the main problems for adolescent health[7,8,9].

Therefore, the importance of knowing these particularities in the care of adolescents was observed in the results of this research, with 100% approval by the local judges of the competencies that dealt with topics most relevant to these patients (competencies 1 to 13, 16 and 19).

That said, after the first analysis was carried out with the local judges, 14 competencies were approved without modification with 100% approval, while 6 were approved with 87.5%. These results demonstrated the concern and view of local judges with the academic training of future medical graduates.

Furthermore, training in Adolescent Medicine (AM) during graduation proved to be effective in improving the care of young people, as indicated by some studies, directly influencing the follow-up of this patient. Some studies have also shown that adolescents who received follow-up or counseling by health teams showed a considerable reduction in involvement with risk behavior, especially related to the consumption of alcohol, tobacco and risky sexual activity[10,11].

As pointed out by Campos and Senger (2013)[12], the presence of professionals without adequate preparation harms the care process at all levels of care at the SUS, which generates low resolution, unnecessary referrals and insignificant practices. In addition, the study by Silva et. al. (2021)[13] highlights that some public health programs are not fully implemented due to the deficiency in care, and as a result, we observed a low demand from adolescents for health services in primary care, motivated by the lack of a bond between the adolescent and the health professional.

Competency 14, which addresses teenage pregnancy, had a "very relevant" index of 83.7% in the first round of the questionnaire. In the second round, local judges requested modifications to include guidance on preventive measures. This request is in line with the literature, which indicates that teenage pregnancy results not only from sexual desire, but also from sexual misinformation.[14]

When analyzing competence 15, related to the identification of gender issues (incongruence and dysphoria), it was reformulated by the panel of judges to increase its complexity, since, a general practitioner in Primary Care must perform the initial care, suspect the diagnosis, guide the family and refer the patient to specialized centers. It is important to highlight that transgender children and adolescents face greater vulnerability to suicidal behavior due to bullying, violence, rejection, and social isolation.[15,16]

In addition, competence 17, which addresses assessment instruments for mental health, such as tests for eating disorders, anxiety, depression and drug use, had its complexity reduced at the request of 25% of local judges. Therefore, this competence was combined with competence 25, which deals with psychiatric disorders in adolescence, resulting in the creation of the new competence 24, which emphasizes the importance of knowledge about the mental health of adolescents.

Competencies 22 and 23, which address frequent problems in Adolescent Medicine and general medical skills, had a request for modification in complexity by 25% of the judges. In addition, the judges suggested that disorders of the endocrine system be screened and referred for specialized follow-up.

According to the study by Abreu et al. (2018), endocrine and metabolic diseases, along with mental illnesses, are the most common pathologies in Adolescent Medicine outpatient clinics. Among the disorders, obesity stands out as the most prevalent, with an average growth rate of 21% per year in diagnosis.

Therefore, the Matrix of Clinical Competencies in Adolescent Medicine in the medical undergraduate course is proposed as the technical product of this research, so that it would contribute to a discussion throughout the course of the topics related to Adolescent Medicine, favoring a spiral learning with different levels of complexity, stimulating the developing and acquisition of skills.

CONCLUSION

In view of the above, it is necessary to analyze the training of general practitioners, with the use of tools that can be used in the competency matrix. Furthermore, competency matrices are essential to meet the needs of adolescents in an effective and comprehensive way, contributing to the quality of care and the well-being of this population.

Thus, the 24 main competencies of Adolescent Health treated in primary care were described, which are relevant to the training and knowledge of a general practitioner.

The doctor does not necessarily need to know how to meet all the demands of the adolescent; however, one needs to be attentive and listen to questions and doubts during consultations to be able to best solve these demands with the help of specialist professionals, becoming future general practitioners qualified to attend to the numerous issues related to adolescent consultation.

AUTHORS' CONTRIBUTIONS

José Francisco Carvalho de Pinho: contributed with conceptualization, formal analysis, research, methodology, project administration, writing of the manuscript. Milena Coelho Fernandes Caldato: contributed to the Supervision. Camila Noronha de Pinho and Amanda Gato contributed with the visualization, writing of the manuscript and formal analysis.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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DATA AVAILABILITY STATEMENT

Research data are only available upon request

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