

## Understanding the phases of life: the relationship between healthcare professionals and different patient profiles

*Conhecimento sobre as fases da vida: relação do profissional de saúde com os diferentes perfis de pacientes*

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### ABSTRACT

The central aim of this study is to promote a comprehensive understanding of the phases of human development, emphasizing their relevance in both academic settings and professional health practice. Through the exploration of innovative educational methodologies, the study seeks to deepen knowledge about the physical, emotional, and social changes that occur across the life span. Such understanding is essential for health professionals to adapt their approaches and care strategies to the specific needs of each stage of life. To this end, the study analyzes the evolution of participants' understanding of human development throughout a series of educational sessions, investigating how engagement in these activities relates to the acquisition and application of knowledge. This cross-sectional study adopted a quantitative and descriptive approach, involving health professionals and students. It also evaluated the effectiveness of the proposed questions, identifying the developmental stages with the greatest variation in responses. Data were analyzed using the Wilcoxon, Chi-square, and McNemar tests, with a significance level set at  $p < 0.05$ . The results demonstrated a clear improvement in knowledge acquisition, particularly concerning the young adult and elderly stages. These findings highlight the link between life stages and healthcare practices, reinforcing the value of playful educational methodologies in the training of health professionals. Additionally, the study encourages further research into human development across the life course and the promotion of humanized care practices in diverse educational settings.

**KEYWORDS:** Life Cycle Stages. Health Professionals. Continuing education in Health. Human Development.

### RESUMO

A proposta central é promover uma compreensão aprofundada das fases do desenvolvimento humano, destacando sua importância tanto no contexto acadêmico quanto na prática profissional, especialmente na área da saúde. Ao explorar novas metodologias educacionais, o estudo busca facilitar o entendimento das transformações físicas, emocionais e sociais que ocorrem ao longo da vida. Esse conhecimento é essencial para que os profissionais de saúde possam adaptar suas condutas e estratégias de cuidado conforme as necessidades específicas de cada fase do ciclo vital. O objetivo deste estudo é analisar a evolução da compreensão dos participantes sobre as fases do desenvolvimento humano ao longo de encontros educativos, investigando a relação entre a participação nas atividades e a aquisição de conhecimento. Também avaliou a efetividade das questões propostas, destacando as fases que apresentaram maior variação nas respostas. Trata-se de um estudo transversal de abordagem quantitativa e descritiva, tendo como público-alvo profissionais e estudantes da área da saúde. A análise dos dados utilizou os testes de Wilcoxon, Qui-quadrado e McNemar, com nível de significância estabelecido em  $< 0,05$ . Os dados coletados indicaram uma clara melhora na aquisição de conhecimento, principalmente com relação às fases jovem adulto e terceira idade. Isso ressalta a conexão entre os estágios da vida e os cuidados com a saúde, enfatizando a importância de metodologias lúdicas na formação de profissionais de saúde. Além disso, os achados incentivam estudos adicionais que explorem o desenvolvimento humano ao longo dos estágios da vida e promovam práticas humanizadas em diversos contextos educacionais.

**PALAVRAS-CHAVES:** Fases do Ciclo de Vida. Profissionais da Saúde. Educação Permanente. Desenvolvimento Humano.

## INTRODUCTION

The stages of life are crucial periods in the development and differentiation of the organism in its psychological and anatomical characteristics. Understanding each stage helps us better understand the typical patterns of human growth and expected psychological conflicts, as well as the boundary between health and disorders<sup>1</sup>. To explain growth and changes during development, the stages of life are marked by various transitions in psychological and anatomical aspects<sup>2</sup>.

At every stage of life, individuals confront a fundamental challenge imposed by their age. Overcoming this challenge is essential for achieving psychological and physical maturity<sup>3</sup>. In this context, human development is categorized into seven stages, as outlined by the psychoanalyst Erik Erikson<sup>4</sup>.

The first phase of life is early childhood, which lasts from birth to 3 years of age. It is characterized by rapid physical growth, with accelerated neuromotor development, increased coordination, and the establishment of primary emotional bonds. Psychologically, it is the phase in which basic trust in the caregiver is formed, which is essential for the development of a secure and healthy personality<sup>1,5</sup>.

The second phase, known as second childhood or the preschool period, occurs between 3 and 6 years of age. There are significant advances in both fine and gross motor control, along with the development of early cognitive skills. This is a period marked by intense curiosity, during which the child begins to assert their autonomy and form an emerging sense of identity. However, children often experience a persistent fear of facing the challenges that accompany this stage.<sup>6</sup>

Between the ages of 6 and 12, children enter the third stage of childhood, commonly referred to as the school-age period. It is during this period that more stable physical growth and the refinement of cognitive and social skills occur. Children develop a greater capacity for concentration, planning, and problem-solving. Psychologically, this is the time when they build their sense of competence and productivity, and begin to value responsibility, collaboration, and external recognition<sup>1,5</sup>.

The fourth stage of life, which extends from the ages of 12 to 19, is adolescence, marked by intense anatomical transformations associated with puberty: sexual maturation, accelerated growth, hormonal changes, and modifications of body structure. At the same time, adolescents face the challenge of constructing their identity, with intense searches for autonomy, social belonging, and their values and goals. This phase ultimately leads to the emergence of young adulthood, the fifth phase, where individuals reach their physical and functional peak, including full muscular, cardiorespiratory, and reproductive capacity. Psychologically, this period focuses on establishing intimate relationships, developing life projects, and achieving independence from

parental figures <sup>1,5</sup>.

The sixth phase corresponds to middle age, characterized by initial signs of anatomical decline, such as loss of skin elasticity, reduction in muscle mass, and hormonal changes <sup>4</sup>. Psychologically, individuals in this stage often seek to create a legacy, care for future generations, and reassess their personal and professional goals. Emotional bonds and a sense of purpose play crucial roles in maintaining emotional health during this phase <sup>6</sup>.

The final phase of life, known as the third age, involves a more noticeable decline in bodily functions, including decreased bone density, loss of muscle strength, sensory changes, and increased vulnerability to chronic diseases. Psychologically, this stage is a time for reflection on life, acceptance of losses, and the maintenance of self-esteem through social connections, personal recognition, and activities that preserve autonomy and a sense of usefulness <sup>6, 7</sup>.

Each stage of life is influenced by various phenomena, one of which is the concept of death. Death marks the end of life and is closely associated with the experience of mourning. It creates a stark contrast between life and the fear of our existence's finitude, affecting both the deceased person and their family and friends. This discomfort with the natural cycle of life is a reality that impacts everyone; however, its effects can vary based on an individual's stage of life and personal experiences <sup>1</sup>.

Also, there is an atypical development that shifts this perspective. Individuals with organic and intellectual needs demonstrate the significance of society in carefully supporting their development <sup>8</sup>. Autism Spectrum Disorder (ASD) is a good example of this, as it shows how individuals form perceptions based on a world that is unique to them. This shapes a multidimensional entity that establishes its own physical and psychological patterns <sup>9</sup>.

The organic development of indigenous Brazilian people is influenced by their unique lifestyle habits and cultural customs. Customs and cultural impositions raise questions about the traditional linear progression of life stages among these people. It is crucial to incorporate scientific knowledge in a way that respects and preserves the cultural reality of these communities, ensuring that any external interventions are in harmony with their distinct characteristics <sup>10</sup>.

The combination of all these characteristics is rarely discussed in universities and health institutions, which requires students and professionals to conduct additional research to improve their care for future patients <sup>11</sup>. It is understood that when interactive forms of knowledge are provided in a way that is close to clinical practice, individuals are more likely to assimilate and apply this knowledge.

Healthcare professionals must have the expertise needed to care for all types of patients and be able to build solid relationships with them. This is especially important in hospital settings, where patients are in unfamiliar surroundings, far from their families. They face routines, rules,

and procedures that dictate their actions, which can significantly impact the behavior of individuals of all ages <sup>12</sup>.

Therefore, healthcare professionals must be encouraged to develop the ability to relate to people at any stage of life and thus build a relationship of trust with the individual, where they stop seeing only the hospital-centric professional and start seeing the professional with humanized and individualized care <sup>13</sup>. Addressing the various physical, mental, and physiological characteristics that define each stage of life, as well as the atypical situations that may arise throughout this process, is fundamental to the academic training of healthcare professionals.

Although previous studies, both national and international <sup>1-6</sup>, have addressed the stages of life in isolation, this research is unprecedented in that it combines these distinct stages and relates them to the experiences associated with each stage, based on the expected characteristics of human development.

This study stands out as a pioneering effort in correlating all stages of human life within the context of health practice. It seeks to analyze the evolution of participants' knowledge about human development through the application of an innovative educational approach. In light of this, the research aims to contribute to the enhancement of teaching strategies in the training of health professionals, fostering a more critical and applied understanding of human development.

## **METODOLOGY**

### **Study Description**

This is a quantitative, cross-sectional, descriptive, and quasi-experimental study with a pre- and post-test design, conducted to evaluate the evolution of participants' knowledge about the phases of human development after an educational intervention.

The study was approved by the Ethics Committee of the Tropical Medicine Center of the Federal University of Pará (opinion n.º 6.542.134; CAAE n.º 72843323.9.0000.0018), in compliance with Resolutions 441/2011/CNS and 466/2012/MS of the National Health Council/Ministry of Health.

### **Study population**

The study included students and health professionals of both genders, aged 18 or over, who signed the Free and Informed Consent Form (FICF), pre-registered for the activity, attended the lectures, and answered the questionnaire in full. Participation was voluntary, and only individuals who demonstrated an explicit interest in studying the phases of human development

addressed during the meetings were included.

Individuals with a prior diagnosis of cognitive impairment, learning difficulties, or communication disorders, declared at the time of registration, were excluded from the sample. Additionally, participants who were not from the health field or who, at any stage of the research, chose not to continue, even after signing the FICF, were also excluded.

In this study, it was decided not to perform a sample calculation due to the exploratory and descriptive nature of the research, whose main objective was to analyze the evolution of participants' knowledge based on a specific educational intervention. The sample was composed in a non-probabilistic and convenient manner, including all participants who attended the meetings and voluntarily agreed to participate in the research. Thus, the number of participants was determined by availability and adherence to the event, which is common in educational studies with specific interventions.

## Procedures

The research was conducted online between June and November of 2022 to reach professionals and academics in the health field. The theme presented to the participants was based on the analysis of movies and lectures related to various stages of life: 1) Conception, pregnancy, childbirth, and puerperium; 2) Early childhood; 3) Second childhood; 4) Third childhood; 5) Puberty and adolescence; 6) Young adulthood; 7) Middle age; 8) Third age; 9) Death; 10) Grief; 11) Atypical development (Autism Spectrum Disorder); 12) Phases of life from a cultural perspective (Indigenous culture of the Xingu ethnic groups).

The movies selected for the event represented the characteristics of each period of life linked to the knowledge of the expert speaker at the meeting. These were professionals in the medical, nursing, or psychology fields, with expertise in each phase of life.

The organization was done through the social networks of the project. The Google Meet access links for the meetings, as well as the announcements and dissemination of the lecture content, were shared with the participants beforehand. Therefore, specific movies and streaming platforms were recommended in advance for each lecture theme (see Table 1).

**Table 1 – Class Schedule**

<b>THEME (stages of life)</b>	<b>MOVIE</b>	<b>SEARCH PLATFORM</b>
1 - Conception, pregnancy, childbirth and puerperium (CPCP)	Marley & Me (2008)	Netflix (finding)
<b>THEME (stages of life)</b>	<b>MOVIE</b>	<b>SEARCH PLATFORM</b>
2 - Early Childhood (1st CHI)	Storks (2016)	Disney+
3 - Second Childhood (2nd CHI)	Monsters, Inc. (2001)	Disney+
4 - Third Childhood (3rd CHI)	Monica and Friends: Bonds (2019)	Globo play
5 - Puberty and Adolescence (PU/AD)	Inside Out (2015)	Disney+
6 - Young Adulthood (YA)	Zootopia (Zootrópolis) (2016)	Disney+
7 - Middle Age (MA)	Click (2006); My Mom Is a Character 2 (2016)	YouTube and Globo play
8 - Third Age (3rd A)	Up (2009)	Disney+
9 – Death (DEA)	Soul (2020); Notes for My Son (2020)	Disney+ e Netflix
10 - Grief (GRI)	The Starling (2021)	Netflix
11 – Atypical development: Autistic Spectrum Disorder (ASD)	Front of the Class (2008)	YouTube
12 - Stages of life from a cultural perspective: Indigenous Culture of the Xingu (IND) ethnicities	Tainá 3: The Origin (2011)	Globo play

Source: Prepared by the authors

The meetings were held every two weeks for 2 hours, discussing the characteristics and milestones of different phases of life. Each meeting was led by about two speakers who aimed to assess the anatomy and psychology of a particular phase of life using real-life experiences and

the experiences of fictional characters.

To measure the participants' knowledge, they were asked the question: "Can you assess your level of knowledge about the stages of life?". It's important to note that the potential progression of knowledge about the stages of life was examined by comparing them across distant life periods that represent physiological and social milestones of differentiation. These comparisons of life stages were made by correlating them based on the perception of the same participants in all 12 meetings held at different times, with a  $p\text{-value} < 0,05$ .

The responses were rated on a scale from 0 to 5. A score of 0 indicated that the participant had acquired no knowledge, while a score of 5 meant that they had retained a large amount of information about the stage of life discussed.

The study also measured the participants' knowledge of each lecture through *check-in* and *check-out* forms. These forms contained 4 questions that were repeated at both times. The purpose was to evaluate the specific knowledge acquired in each session related to the physiological and social development milestones of the given stage of life in the movie's plot. This allowed for a comparison of the participants' responses and an assessment of the level of variation between the "yes" and "no" answers based on prior knowledge and the responses after the virtual discussion, providing a clearer understanding of the topic (see Table 2).

**Table 2** - Questions about specific knowledge about each stage of life

(Continues)

Stage of life	Questions
1st CHI	<ol style="list-style-type: none"> <li>1. Are the initial signs of behavioral and physical development in early life linked to the security provided by motherhood and fatherhood?</li> <li>2. Is a child from birth to 3 years of age passive to changes in the environment outside the womb and unable to demonstrate a certain degree of autonomy?</li> <li>3. Does the movie "Storks" reflect contemporary early childhood, influenced by technology?</li> <li>4. According to the movie, is the fundamental trust that a newborn has in the person responsible for raising them the main theme of early life?</li> </ol>
2nd CHI	<ol style="list-style-type: none"> <li>1. The second childhood is the stage of life during which children begin to develop their first notions of responsibility. Can you identify the characteristics of second childhood?</li> <li>2. The second stage of life is characterized by the formation of the first fixed memories, especially when the family encourages the child's neuropsychomotor development. Does a compromise in this stage of life prevent good development in the later stages?</li> <li>3. In the movie Monsters, Inc., can you identify the characteristics of the second stage of life, such as: imagination, first friendships, fear, frustration, and cognitive development?</li> <li>4. The movie Monsters, Inc. addresses the creation of goals as a perspective for progress. In this sense, is it possible to subtract from the movie the reality of the excessive pressure that children suffer for accelerated development?</li> </ol>



(Continuation)

Stage of life	Questions
3rd CHI	<ol style="list-style-type: none"> <li>1. Third childhood is a period of psychological discovery for the individual. Is this a phase of life in which playful and creative behavior is more accurate?</li> <li>2. Is the investigative nature and detachment from the presence of parents a characteristic of the third phase of life?</li> <li>3. Can you relate the film "Monica and Friends: Bonds" to the characteristics of third childhood, such as autonomy, creativity, the first steps of extra-familial affection, expression of emotion, and trust?</li> <li>4. Are anatomical changes already evident at this stage of life, such as greater development of sexual organs, the appearance of body hair, and restructuring of the body's "trunk"?</li> </ol>
PU/AD	<ol style="list-style-type: none"> <li>1. Is the fifth stage of life when the first signs of freedom become apparent?</li> <li>2. Does the fifth stage of life coincide with the onset of significant anatomical changes?</li> <li>3. Can the movie "Inside Out" depict the traits of the fifth stage of life, highlighting the period of puberty and adolescence?</li> <li>4. In the movie "Inside Out," during the scene where the main character, after a series of disappointments, decides to take a bus and run away to her old city without her parent's permission, can we identify behaviors typical of the fifth stage of life?</li> </ol>
YA	<ol style="list-style-type: none"> <li>1. Does the sixth phase of life bring about new personal needs regarding forming solid bonds and starting a family?</li> <li>2. Does the sixth phase of life begin after the end of adolescence?</li> <li>3. Can we identify characteristics of the sixth phase of life in the characters' actions in "Zootopia"?</li> <li>4. An important aspect of the sixth phase is the pursuit of stability in life. In "Zootopia," the young rabbit encounters various challenges in her quest to become a police officer. From this perspective, would you classify this character as a young adult?</li> </ol>
MA	<ol style="list-style-type: none"> <li>1. Middle age is often seen as the stage of life where many people believe they can finally achieve everything they have planned. Are the previous stages of life merely learning opportunities for a better experience in this stage?</li> <li>2. The first physical limitations appear during this stage. Do the anatomical changes impact psychological balance?</li> <li>3. After consolidating adulthood, is there a desire to return to previous stages of life and change the undesirable choices, as seen in the film "Click". Is restlessness with current life a common characteristic of middle age?</li> <li>4. Can you compare the perspective of the film "Click" with the reality of middle-aged people you know or with your own experiences, if you are in this stage of life?</li> </ol>
3rd A	<ol style="list-style-type: none"> <li>1. Should elderly individuals, who are in the last phase of life, be treated as if they have no experiences or desires of their own, and must always obey the commands of other people?</li> <li>2. Elderly people often have their circle of friends reduced due to various factors, including loss. Additionally, most of them live alone and may not have activities outside the home, so is this phase marked by feelings of sadness or depression?</li> <li>3. Does Mr. Fredricksen represent some aspects of the last phase of life, as seen in the changes in his feelings and attitude throughout the movie, from a sad and apathetic beginning to a more spirited outlook as he embarks on adventures with the boy Russell?</li> <li>4. Based on basic knowledge about the elderly and the story of the movie, do you believe that the experiences acquired throughout life shape an individual's personality and that the environment in which an elderly person lives can change the way they experience this phase of life?</li> </ol>



(Conclusion)

Stage of life	Questions
DEA	<ol style="list-style-type: none"> <li>1. Death marks the end of the life process. Does death bring about intense emotions for both the person who is dying and their loved ones?</li> <li>2. The period leading up to death is filled with doubts and reflections on the experiences acquired throughout life. Can this reevaluation of life help this person during this difficult time?</li> <li>3. In the proposed movie, is it possible to point out the experience of self-evaluation before and after death with the drama experienced by the protagonist?</li> <li>4. In addition to transforming the debate about death into something playful, do you consider that the film "Soul" also has as its message a reflection on daily human experience and behavior?</li> </ol>
GRI	<ol style="list-style-type: none"> <li>1. Can grief impact the normal development of any stage of life, and is it a key factor in behavioral changes?</li> <li>2. Is anxiety about the end of life a time for psychological reflection that influences an individual's health and physical well-being?</li> <li>3. The movie "The Starling" explores two perspectives on grief. Can you identify these perspectives in the lives of each character?</li> <li>4. Is the family, friends, and professional support network crucial in understanding grief as a transitional phase in life?</li> </ol>
ASD	<ol style="list-style-type: none"> <li>1. Is autism spectrum disorder considered a disease?</li> <li>2. Does each person with autism spectrum disorder develop their own physical and psychological characteristics?</li> <li>3. Is the context experienced by the protagonist of the movie "Front of the Class" different from the situation experienced by individuals with autism spectrum disorder?</li> <li>4. Is the main character's desire for acceptance by his classmates and later by his group of students outside the reality of the stages of life?</li> </ol>
IND	<ol style="list-style-type: none"> <li>1. Are the developmental experiences of Indigenous individuals similar to those of other members of society?</li> <li>2. Do the traditions and cultural influences of their ancestors play a significant role in the development of indigenous people?</li> <li>3. Is Tainá's desire to protect the forest connected to her current stage of life?</li> <li>4. Does Tainá's actions in the film suggest any negative impact on her personal development?</li> </ol>

Source: Prepared by the authors

## Data analysis

To analyze and consolidate the data obtained through the forms, we analyzed the proportions using categorical data to evaluate the characteristics of each phase before and after the meeting.

Data from longitudinal questions were represented as medians with  $\pm$  1st and 3rd quartiles (q1 and q3) and were analyzed using the Wilcoxon test. Descriptive values such as median and interquartile ranges were used for nonparametric analysis, with a significance level of <5%. Cohen's d coefficients were used to assess the effect size, with "Null effect" for  $d < 0.10$ , "Small

effect" for  $d < 0.40$ , "Moderate effect" for  $d < 0.70$ , and "Large effect" for larger values<sup>14,15</sup>.

The Chi-square test was used to compare categorical data between groups. The McNemar test was applied to evaluate the responses observed in two categories organized in a table. The rows represented the two conditions under study (Life Stage and Question), and the columns represented the categories of possible results (Check in and Check out associated with yes or no answers).

The significance level was  $<5\%$ . The Phi coefficients ( $\Phi$ ) were used in a 2x2 contingency table to evaluate the effect size of the Chi-square test. The effect size was defined as "Null effect" for  $\Phi < 0.10$ , "Small effect" for  $\Phi < 0.30$ , "Moderate effect" for  $\Phi < 0.50$ , and "Large effect" for larger values<sup>14,15</sup>. All analyses were performed using IBM SPSS 22 and GraphPad Prism 10 software.

## RESULTS AND DISCUSSION

The study sample included 242 participants, with the majority being health students (69.83%) and the remaining (30.17%) consisting of trained professionals. In terms of gender, there was a significant predominance of males (78.51%). Most participants were engaged in the field of Medicine (39.25%). Geographically, the sample showed a strong concentration of participants from the North region of Brazil (90.05%). Additionally, a majority of participants reported having access to streaming platforms (64.87%), which may have enhanced their engagement with the pedagogical approach based on audiovisual narratives (see Table 3). On average, 47.75 participants attended each of the 12 virtual meetings held.

**Table 3 – Sociodemographic description of participants**

(Continues)

Variable	N= 242 (100%)
<b>Occupation in the health field</b>	
Student	169 (69,83)
Professional	73 (30,17)
<b>Gender</b>	
Female	52 (21,48)
Male	190 (78,51)
<b>Area of activity/study</b>	
Medicine	95 (39,25)
Nursing	38 (15,70)
Psychology	4 (1,65)
Others (Biomedicine, Dentistry, Pharmacy, Health Management, and Physiotherapy)	31 (12,80)

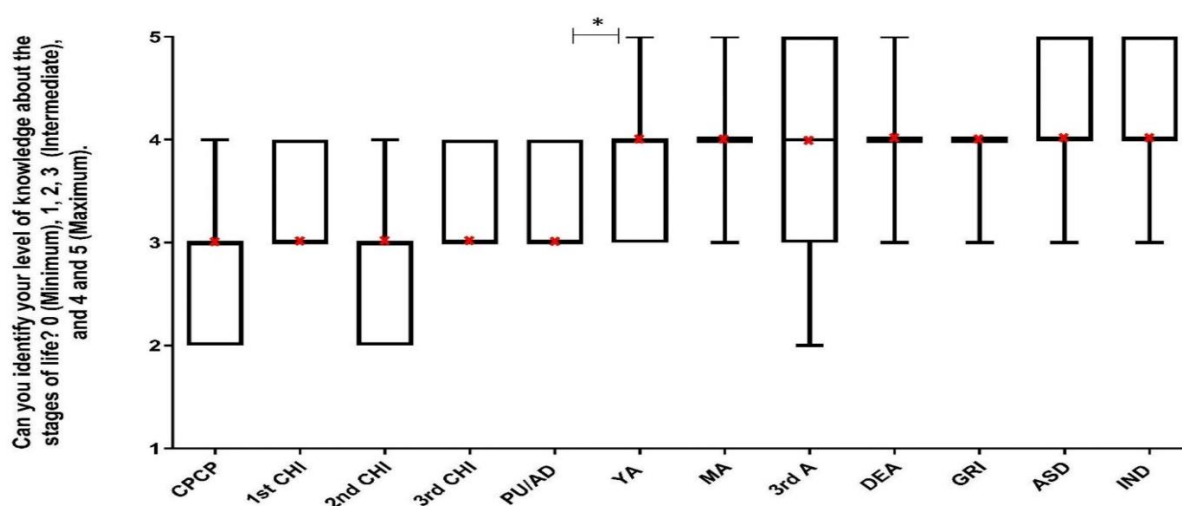
(Conclusion)

Variable	N= 242 (100%)
<b>Geographical Distribution</b>	
North	218 (90,05)
Others (Northeast, Midwest, Southeast, and South)	24 (9,91)
<b>Access to streaming platforms</b>	
Yes	157 (64,87)
No	85 (35,12)

Source: Prepared by the authors

In each meeting, the level of knowledge about the stages of life was assessed using Boxplot graphs. Based on Figure 1, it was observed that the median knowledge level for the first five meetings (CPCP to PU/AD) was 3, indicating intermediate knowledge according to the numerical scale suggested by the researchers. The "YA" meeting showed median knowledge levels of 4 up to the last meeting (IND), indicating a greater acquisition of knowledge through the lectures based on the films in these later meetings compared to the earlier ones ( $p < 0.0001$ ). This is evident from the presence of an asterisk (\*) between the PU/AD and YA phases. These scaled values show that participants were engaged from the first meeting in understanding the importance of knowing the stages of life and using this knowledge to support a clinical practice focused on the human being, as opposed to a hospital-centric model that only considers the pathology and lacks longitudinal patient relationships <sup>16</sup>.

**Figure 1** – The quantification of responses from 0 to 5 regarding the level of knowledge in each meeting was expressed as median (X - red)  $\pm$  1st and 3rd quartile (q1 and q3), illustrated in a boxplot



CPCP: Conception, pregnancy, childbirth and puerperium; 1st CHI: Early Childhood; 2nd CHI: Second Childhood; 3rd CHI: Third Childhood; PU/AD: Puberty and Adolescence; YA: Young Adult; MA: Middle Age; 3rd A: Third Age; DEA: Death; GRI: grief; TEA: Atypical Development - Autism Spectrum Disorder; IND: Stages of life from a cultural perspective - Indigenous Culture of the Xingu ethnic groups.

Source: Prepared by the authors

In the first and third box plots, the median was 3 (2-3) for CPCP and 2nd CHI, respectively; the minimum value (2) coincides with the 1st IQ, the median is the 3rd IQ, and presents a maximum value of 1 level above the median. This research highlights the participants' lack of knowledge in these life phases, indicating less understanding of the other phases. On the other hand, this same effect occurs in the last two box plots (ASD and IND), which show greater understanding, presenting a median of 4 (4-5).

The CPCP are transitional periods in a woman's life that affect both her physical and emotional well-being <sup>17</sup>. Our study revealed that this phase is not well understood, despite its importance. Healthcare professionals need to have a better understanding of these life stages to provide improved treatments and disease prevention. These measures include conducting recommended exams during pregnancy, addressing the pregnant woman's habits and lifestyle, emphasizing the importance of vaccination and the use of supplements and vitamins, and promoting mental health. These actions can help prevent complications during pregnancy, childbirth, and the postpartum period, and reduce maternal, perinatal, and infant morbidity and mortality. Failure to follow these recommended health measures during pregnancy may lead to the development of diseases or syndromes in the early stages of infancy<sup>18</sup>.

The ASD and IND meetings highlighted the interest that future health professionals have in updating themselves concerning populations that require permanent care adapted to their reality. These meetings also helped participants understand the significance of cultural aspects and disorders, and how they can be reflected upon and addressed using new tools. Such actions encourage changing the reality of care for vulnerable populations <sup>19</sup>.

It is noted that the meetings with the second lowest level of knowledge refer to those periods of life that are challenging in health practice, namely: 1st CHI, 3rd CHI, and PU/AD, which presented a median of 3 (3-4). It is noted that health care for these stages of life is marked by "health paternalism", an expression that becomes valid since the determining characteristics of these populations are ignored due to the superiority and rigidity of semiology and clinical thinking. It is worth noting that technical knowledge must be included in health care in a way that is shared with the patient according to the autonomy of their stage of life <sup>20</sup>.

It is no coincidence that these are the meetings that mark periods of psychological, anatomical, and social transition for which a person-centered clinical practice is essential, since humanization and specific attention are associated with better reception and greater resolution of the complaints presented <sup>21</sup>.

Health care for children is divided into different age groups. Early and late childhood (1st and 3rd childhood) receive structured care in a specific service <sup>22</sup>. On the other hand, preschool children (2nd childhood) only rely on the subjectivity of the health professional and anthropometric monitoring and are not provided with objective and unique care <sup>23</sup>. The 2nd CHI meeting

demonstrates this reality by presenting a lower level of knowledge, given that participants concentrated their responses between levels 2 and 3 (1st and 3rd quartile).

Another notable factor is that the events of the MA, DEA, and GRI phases coincided with the median (level 4) in all quartiles, indicating the smallest variance and suggesting a more homogeneous knowledge of these phases than the others. The MA phase represents a period of life in which human productive strength is highly valued. However, the pressure for excellent activities during this phase leads to what is commonly referred to as a "midlife crisis," which is a general dissatisfaction with one's quality of life. It's important to note that men and women experience hormonal menopause with different perceptions and periodicities, but both go through physiological changes and a reality of sexual failure <sup>24</sup>.

The middle age phase has characteristics that are familiar to health professionals, since the majority of them are in this phase of life, and thus are aware of the main clinical conditions that these individuals have and that are related to physical wear and professional demands, such as Burnout and panic syndrome, anxiety and Repetitive Strain Diseases <sup>25</sup>.

The concept of death and mourning reflects the inevitable experience that everyone encounters at some point in their lives. Students and healthcare professionals need to have a deep understanding of this topic, as their profession involves managing the delicate balance of life and death. However, the death of patients can sometimes lead to a detachment from patients, interrupting the longitudinal relationship <sup>26</sup>. It's important to emphasize that this search for knowledge about death and mourning ensures that the professionals involved can always guarantee the quality of life of the hospitalized. Furthermore, in cases of terminal illness, this knowledge helps in providing palliative care to the individual and their support system <sup>27</sup>.

The pairwise comparisons that met the expectation of greater simultaneous participation and that answered the question "Can you identify your level of knowledge about the stages of life?" generating pertinent discussions in the live meetings were ( $p < 0.05$ ) (Table 3): a) CPCP and DEA; b) 1st CHI and MA; c) PU/AD and MA, demonstrating that during the meetings the participants acquired knowledge to identify the stage of life and act according to the characteristics of these milestones to encourage them to have resolute and holistic behaviors.

**Table 4** – Comparisons between life phases with greater significance for assessing the knowledge acquired between them, through the descriptive values in figure 1

Group 1	Group 2	N	Med ± (q1 and q3) Group 1	Med ± (q1 and q3) Group 2	p	Power (1 -β)	Cohen d (Effect size)
CPCP	GRI	31	3 (2-3)	4 (4-4)	0,0001***	0.5	0.363 <sup>+</sup>
1st CHI	MA	27	3 (3-4)	4 (4-4)	0,003**	0.4	0.364 <sup>+</sup>
PU/AD	MA	31	3 (3-4)	4 (4-4)	0,031*	0.5	0.366 <sup>+</sup>

Caption: Comparison between life stages. N corresponds to the common number of participants. Med (median) ± 1st and 3rd quartile (q1 and q3) which correspond to the stages respectively. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . + Small effect.

Source: Prepared by the authors

The comparisons between the above meetings were made from the perspective that the health professional tends to better distinguish the characteristics of the life phases at the extremes of development and thus apply a specific conduct, as soon as there is an increase, even if slight ( $d < 0.40$ ), of the medians between the compared phases ( $p < 0.05$ )<sup>28</sup>. The phenomena and health needs of conception and childbirth contrast with the necessary measures at the end of life, whether in palliative care or thanatology methods. However, both phases tend to instigate that the professional involved has the person as the center of their action, and the technical methods are complementary to the individual's needs<sup>29,30</sup>.

In this analysis, early childhood is characterized by the child being a passive recipient of human care, fully reliant on caregivers and their interpretations of non-verbal cues<sup>22</sup>. Early childhood and puberty/adolescence are both significant transitional periods in a person's life, each with distinct characteristics. Puberty and adolescence are marked by self-discovery, as individuals undergo physical, emotional, and social changes. A heightened awareness of their bodies prompts adolescents to seek self-knowledge and information on health risks, such as sexually transmitted infections<sup>31</sup>. In contrast, the Middle Age is a phase in which individuals often do not actively seek out health services and tend to manage their health needs independently. It's important to note that during this stage, individuals are influenced by societal attitudes towards seeking medical assistance. For example, men's low adherence to primary care health actions increases the incidence of death due to chronic non-communicable diseases<sup>32</sup>.

In discussions about prior knowledge and the responses following meetings between speakers and participants, five key stages of life were analyzed. The standout questions were as follows: 1. In the first stage of childhood (1st CHI), question 1: "Are the initial signs of behavioral and physical development in early life linked to the security provided by motherhood and fatherhood?"; 2. In the second stage of childhood (2nd CHI), question 1: "The second childhood



is the stage of life during which children begin to develop their first notions of responsibility. Can you identify the characteristics of second childhood?"; 3. In the pre-teen/adolescent (PU/AD) phase, question 3: "Can the movie 'Inside Out' depict the traits of the fifth stage of life, highlighting the period of puberty and adolescence?"; 4. In the third age (3rd ID) phase, question 1: "Should elderly individuals, who are in the last stage of life, be treated as if they have no experiences or desires of their own, and must always obey the commands of other people?"; 5. In the autism spectrum disorder (ASD) phase, question 2: "Does each person with autism spectrum disorder develop their own physical and psychological characteristics?" (Table 2).

Within this context, the separate analysis of each of these "Stages of Life" related to each of the questions mentioned above demonstrated significance for the study ( $p < 0.05$ ), thus revealing greater homogeneity of knowledge among participants both pre- and post-lecture (Table 5).

**Table 5** – Association of participants' responses and verification of the level of variation between responses based on prior knowledge (Check-in) and post-virtual dialogue (Check-out), through comparison with the questions in Table II

(Continues)

	Check-in (Yes)	Check-in (Yes)	Check-in (No)	Check-in (No)	<i>P</i>	Power (1 - $\beta$ )	Effect size ( $\Phi$ )
	Check-out (Yes)	Check-out (No)	Check-out (Yes)	Check-out (No)			
1st CHI							
1 - Are the initial signs of behavioral and physical development in early life linked to the security provided by motherhood and fatherhood?	47	0	4	0	0,0455*	0.38	0,280 <sup>+</sup>
2nd CHI							
1 - The second childhood is the stage of life during which children begin to develop their first notions of responsibility.	35	0	13	0	0,0003***	0.9	0,520***
Can you identify the characteristics of second childhood?							

(Conclusion)

	Check-in (Yes)	Check-in (Yes)	Check-in (No)	Check-in (No)	<i>P</i>	Power (1 - $\beta$ )	Effect size ( $\Phi$ )
	Check-out (Yes)	Check-out (No)	Check-out (Yes)	Check-out (No)			
PU/AD							
3 - Can the movie "Inside Out" depict the traits of the fifth stage of life, highlighting the period of puberty and adolescence?	28	7	1	0	0,0338*	0.28	0,333 <sup>++</sup>
3rd A							
1 - Should elderly individuals, who are in the last stage of life, be treated as if they have no experiences or desires of their own, and must always obey the commands of other people?	2	4	0	40	0,0455*	0.3	0,295 <sup>+</sup>
ASD							
2 - Does each person with autism spectrum disorder develop their own physical and psychological characteristics?	6	4	0	24	0,0455*	0.3	0,342 <sup>++</sup>

Caption: The table shows the number of participants who answered yes at check-in and check-out, yes and no at check-in and check-out, no and yes at check-in and check-out; and no at check-in and check-out for each question. 1st CHI: Early Childhood; 2nd CHI: Second Childhood; PU/AD: Puberty and Adolescence; 3rd A: Third Age; ASD: Atypical Development - Autism Spectrum Disorder. \* $p < 0.05$ , \*\*\* $p < 0.001$ . + Small effect, ++ Moderate effect, +++ Large effect.

Source: Prepared by the authors

During the 1st CHI meeting, 92.15% of participants answered yes at both times (before and after the lecture), stating that the first signs of behavioral and physical development in the first phase of life are combined with the security that motherhood and fatherhood provide. Although this phase was statistically significant ( $p < 0.05$ ), the effect size was small. While all babies are initially similar at birth, their environment and experiences shape their development and have a continuous impact throughout their lives<sup>33</sup>. Therefore, the participants involved in the project state that parental care that generates security during the 1st CHI phase influences the developmental characteristics of these children.

As depicted in the 2nd CHI, 72.91% of participants believe that children start developing

their sense of responsibility at this point. This is a key characteristic of second childhood, as seen in the movie "Monsters, Inc.". At this stage, children learn, develop, and acquire important skills for their growth and for living in a community, laying the foundation for understanding rights and responsibilities <sup>34</sup>. During this time, children are encouraged to take on more household chores, like helping with cleaning or preparing meals. It's worth noting that this stage showed a strong connection between the check-in and check-out phases of all stages of life, with over 90% of the general population showing this association. This had a significant impact with a large effect size and  $p < 0.001$ .

During the PU/AD Life Stage meeting, the majority of participants (77.77%) reported that they noticed characteristics of the stage portrayed in the movie "Inside Out" both at check-in and check-out ( $p < 0.05$ ), with a moderate effect size. The film depicts the main emotions as anger, joy, sadness, fear, and disgust, showing how these feelings work inside the brain of a teenager and how she responds to them at home and school. It is during the PU/AD phase that emotional regulation skills must be developed. It is understood that, because they are exploring their identity and experiencing a series of new situations, such as bodily changes, teenagers may face many moments of instability, requiring this ability to regulate emotions, and demonstrating this to their peers is extremely important, which is also evidenced in the movie <sup>35</sup>.

In the discussion on the 3rd A, it was found that 86.95% of the participants confirmed that the elderly should not be infantilized. It was recognized that the elderly have their own experiences and desires and should not be subjugated to the desires of others, as if they were incapable of thinking for themselves. Although this data was considered statistically significant ( $p < 0.05$ ), the observed impact was considered to be of small magnitude ( $\Phi < 0.30$ ). The aging of human beings should not be viewed by society, and especially by health professionals, with stereotypes of losses, disabilities, limitations, illnesses, and dependence. Each person ages individually, and they must be treated uniquely, always offering to listen and allowing them to have autonomy in their choices <sup>30</sup>.

During our discussion about the different stages of life, we talked about how each person experiences these stages uniquely. We also explored specific issues such as the impact of indigenous culture and Autism Spectrum Disorder (ASD). ASD is a developmental disorder that affects communication, behavior, and social interactions. It is usually diagnosed in childhood and often requires lifelong therapy for individuals to improve their development <sup>35</sup>. In our conversation about ASD, participants expressed both before and after the lecture that they understood ASD is not a disease. This is a positive result ( $p < 0.05$ ) with a moderate effect size, considering that Autism is still stigmatized by society and some health professionals.

The results of this study support the existing literature on the effectiveness of innovative teaching methods for studying the stages of human development. A significant increase in

participants' knowledge was observed after the intervention, particularly about young adults and the elderly. This emphasizes the effectiveness of playful pedagogical strategies in training health professionals. These findings suggest that varied educational approaches can enhance engagement and facilitate a deeper understanding of both the anatomical and psychological aspects of the life cycle.

Despite some methodological limitations, this study presents relevant contributions. The sample consisted of participants who voluntarily signed up, motivated by a prior interest in the topic, which may limit the generalization of the results to the entire population of health professionals. However, this characteristic favored a high level of engagement, contributing to the quality and depth of the discussions during the meetings.

While using online lectures may restrict certain aspects of face-to-face interaction, it increases the scope of the intervention, promoting wider access to knowledge and enabling participation from individuals in various geographic regions. The potential variation in speaker effectiveness was addressed through the careful selection of professionals with proven expertise in their respective fields.

The subjectivity in the assessment scales was reduced by using multiple instruments, which improved the reliability of the data collected. Although the monitoring period was relatively short—just six months—it was adequate to observe significant changes in the participants' knowledge within an interactive and dynamic learning environment.

Researching, analyzing, and understanding life stages from the perspective of healthcare professionals is very important to assert their level of knowledge and fill existing gaps. These professionals need to adapt to changing scenarios and the unique needs of each patient during care. Furthermore, this study provides valuable information for healthcare professionals and the academic community in a region where there is a lack of research in this area.

By publicizing the characteristics of various patient profiles and linking them to different life stages, using films as a reference, we have achieved significant results in discussions about continuing education in health, medical training, and personal development. Therefore, this topic should be further explored in universities to better prepare students for the diverse patient profiles they will encounter.

The results of this study demonstrate the effectiveness of innovative teaching approaches related to life stages. There was a significant increase in participants' knowledge throughout the meetings. The analysis revealed that while initial levels of knowledge were intermediate, participants showed clear improvement in later meetings, particularly in understanding young adults and older adults. Pairwise comparisons indicated that participants successfully identified and applied relevant knowledge, highlighting the positive impact of interactive discussions.

Additionally, the questions posed during the sessions stimulated critical reflection, leading

to a more uniform understanding among participants. These findings underscore the importance of engaging methodologies in training health professionals and in raising community awareness about human development. Further research is recommended to enhance understanding of life stages in diverse educational contexts.

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