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ADOLESCENT DEVELOPMENTAL STAGES IN FOUR DOMAINS - POSTER DESIGN

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Abstract

As a healthcare professional, encountering adolescents as clients is probable in broad workplaces. Meanwhile, healthcare professionals might face several challenges in adolescent care due to age-specific characteristics. Occasionally, it is not easy to differentiate between typical features of adolescents and abnormalities. Therefore, there is a need for healthcare professionals to be aware of adolescent developmental stages.

The purpose of this thesis was to produce an E-poster that contains information on adolescent developmental stages in four domains. This thesis aims to promote an understanding of the adolescent developmental stages in nursing students and healthcare professionals who work with adolescents. By adopting development work as a thesis method, this thesis was designed to make an E-poster containing information on adolescent developmental stages in four domains.

Therefore, this thesis contains a plan, production, and evaluation as development work. The planning part collected information about adolescent development stages in four domains from the literature review. For the production part, the contents of the E-poster were summarized from the literature review. With contents from the literature review, two E-posters were made using Canva and Adobe Creative Cloud Express. Feedback was collected from teachers who are teaching paediatric nursing at Savonia University of Applied Science. Based on Feedback and design criteria, E-poster was edited again. At the end, one E-poster was attached to this thesis as an Appendix.

Based on the result of the literature review for the contents of the E-poster, it could be stated that scholars and researchers have tried to figure out what should be developed in adolescence. Meanwhile, the developmental stages are affected by genes and environments, so a flexible view is recommended. Future studies could be performed on adolescent development with a nonpathological view, by team works of professionals from every four domains of adolescent development.

Keywords
Adolescent physical development, adolescent psychological development, adolescent social development, adolescent spiritual development, poster design

CONTENTS

LIST OF FIGURES AND TABLE

1   INTRODUCTION

 Adolescence is the stage of human development whose age group is between 10 and 19 (WHO 2022). Meanwhile, there is a view that adolescence starts with puberty and ends when the individual attains an independent and stable role in society (Blakemore 2018, 11). For the adolescent to lead a healthy life, access to essential information, quality services, and protective environments are crucial throughout the development (Unicef 2022).

As a healthcare professional, encountering adolescents as clients is probable in broad workplaces. Meanwhile, healthcare professionals might face several challenges with adolescents due to specialized skills for consultation, interpersonal communication, and interdisciplinary care (Salam, Das, Lassi, & Bhutta 2016, 88-92). Furthermore, the difference between age-appropriate development characteristics and abnormality could be minor.

In relation between adolescents and healthcare professionals as an adult, research findings provide evidence that strong, positive relationships with adults can protect adolescents from a range of poor health outcomes and promote positive development (Sieving et al. 2017, 275-278). Also, Milne and Chesson pointed out that awareness of adolescent risk and a proactive approach toward adolescents are recommended to provide better service (Milne & Chesson 2000, 305-308). Therefore, there is a need for healthcare professionals to understand adolescent developmental stages.

Regarding what belongs to development domains in adolescents, the definition of health by WHO, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." was used as a reference. For this thesis, physical, mental, and social domains were extracted as three domains of development in adolescents. (WHO 2022.) Spirituality is also included as the fourth component of development. Jane Watson mentioned that human care relationships in nursing encompass phenomenal field, actual caring occasion, and transpersonal caring (Watson 1999, 73). She also stated that spirituality is a basic human need (Rafael 2000, 34-49).

Similarly, Spurr accentuated the need for nurses to adopt an approach to adolescent care multidimensionally. Because the well-being of adolescents derives from other than physical dimension, healthy relationships, emotional stability, and spirituality. (Spurr, Bally, Ogenchuk & Walker 2012, 320–326.) Therefore, for the multi-faceted adolescent care more than pathological care, there is an obvious need for healthcare professionals to understand the adolescent developmental stages in these four domains.

The purpose of this thesis was to produce an E-poster that contains information on adolescent developmental stages in four domains. This thesis aims to promote an understanding of the adolescent developmental stages in nursing students and healthcare professionals who work for adolescents. This thesis adopted development work as the thesis method (Richey & Klein 2005, 23-38).

2   ADOLESCENT DEVELOPMENT THEORIES

Development involves growth, improvement, and progression over time (Payne 2021, 67). It has been about one hundred years since adolescence is considered as a separate stage of human development. Current theories of adolescents originated from general philosophical ideas about the nature of man and development. Unlike these philosophical ideas, Stanley Hall is considered the first psychologist who approached human development empirically. (Muuss 1996, 1-15.)

Researchers have tried to explain about individuals and development. Sroufe stated that an individual only could be understood within continuing interactions between a developing person and the environmental effect (Sroufe 2005, 19). According to her, development always entails continuity and change because it means something emerging from what was before (Sroufe 2005, 220-221). Hence, development is rather a process than a state (Sugarman 2001, 6).

According to life-span philosophy, there are six assumptions about human development through life-span. Development is multidimensional and multidirectional, showing plasticity. It involves both gains and losses. Development is the outcome of the interaction between the individual and the environment. Also, it is culturally and historically embedded. (Sugarman 2001, 13-24.) Therefore, it could be too partial to use a single theory to understand adolescent development.

Today's knowledge of human development is owed to Sigmund Freud, Erik Erikson, Arnold Gesell, Robert Havighurst, and Jean Piaget. In developmental task theory, a person should perform particular tasks at a certain period of life. (Gallahue, Ozmun & Goodway 2012, 24.) These scholars could be categorized by the focused developmental domains (Muuss et al. 1996; Rice and Dolgin 2002, as cited by Spano 2004).

The scholars who focused on adolescent physical development are Arnold Gesell, G Stanley Hall, and James Tanner. Arnold Gesell noted that biological processes significantly influence behavior, cognition, and other developmental areas. According to him, growth has a pattern. Patterned nerve cell changes endue behavior change patterns (Bergen 2017, 199-203). G. Stanley Hall recognized adolescence as a unique period of development. He even called adolescence a new birth. While Hall emphasized adolescents' hormones, he acknowledged various individual differences. (Dahl & Hariri 2005, 367-382.) James Tanner carried out longitudinal research about the normal growth of adolescents. He suggested what would be the typical puberty features depending on the age. (Marshall & Tanner 1970, 13-23.) The Tanner scale, also called a Sexual Maturity Rating (SMR), was developed by James Tanner. It has five stages of external changes from preadolescent to adult (Emmanuel & Bokor 2017).

Erik Erikson and James Marcia focused on psychosocial development in adolescents. Erik Erikson viewed adolescence as a period of forming a coherent identity (Douvan 1997, 15-21). According to Erikson, integrity is inner sameness. He proposed that a continuous sense of integrity, relationships, and roles that serve identity are necessary for identity formation. Based on Erikson's idea, Marcia created an identity status approach. According to Marcia, identity statuses result from the identity formation process and structural properties of the personality. (Adams, Gullotta, Montemayor 1992 ,9-10.) James Marcia pointed out that a well-functioning identity is a flexible one. According to him, identity formation starts from infancy to late life. He viewed the adolescent period is important for

identity formation. Because physical development, cognitive skills, and social expectations are over-lapped to inspire adolescents to form an identity that connects childhood and adulthood. (Marcia 1980, 159-187.)

Jean Piaget studied cognitive development. As per Piaget, adolescents start to think systematically, reason about abstract concepts, and generate hypotheses. Piaget also believed that adolescents understand ethics and recognize that rules result from the mutual agreement by moral reasoning. (Piaget 2000, 33-47.)

Robert Havighurst focused on social development in adolescents. He believed the adolescent developmental stage encompasses accepting one's physique, adopting values and an ethical system, and developing healthy attitudes towards oneself and social groups. According to him, the adolescent has tasks of developing more mature relations like settling on an appropriate social role, selecting an occupation, and achieving emotional independence. (youthaodtoolbox 2022.)

Sigmund Freud viewed adolescence as the time of seeking psychological independence. (Table 1.) According to him, adolescents can create meaningful and lasting relationships. Freud believed adolescents' sexual desires and activities are healthy and consensual when they are developed well. (Lantz & Ray 2021.)

Table 1. Developmental theorists and their focused area in adolescent (Modified from Spano 2004)

Developmental area and Theorist	Focus area in the adolescent period
Biological: Arnold Gesell, Stanley Hall, James Tanner	Genes and biology determine physical and sexual development.
Psychosocial: Erik Erikson, James Marcia	Personal identity formation
Cognitive: Jean Piaget	Cognitive development, formal operational thought, logical and abstract thinking
Social: Robert Havighurst	Personal independence, consolidating attitudes toward social groups, and a sense of conscience, morality, and values.
Psychological: Sigmund Freud	Psychosexual development, emotional detachment from parents

3   FOUR DOMAINS OF ADOLESCENT DEVELOPMENT

About adolescent development, there could be several approaches. Christie and Viner approached adolescent development as challenges of biological and sexual maturation, identity formation, intimate sexual relationships, and independence (Christie & Viner 2005, 301–304). The essential developmental needs of adolescence were stated by the UCLA center for the developing adolescent. They noted that adolescents need to explore the world, start making decisions, and regulate emotions. Also, developing a sense of meaning and purpose, connection with others, identity formation, and support from adults were proposed as developmental needs of adolescence. (FIGURE 1).

FIGURE 1. Key developmental needs of adolescence (UCLA 2022)

Development in adolescents is interrelated with adolescents' health issues (WHO 2020). Health results from the interaction between social, psychological, and biological factors (Schizoph 2011, 13-19). Also, spiritual health is considered an important part of the overall health status of adolescents (Michaelson et al. 2016, 294-303).   Although the differentiation between physical and mental health is occasionally arbitrary (Ranson & Abbott 2017, 147), regarding each domain of health grants an understanding of the importance of each domain. And it also enables understanding of the whole person and may give an idea of how to support adolescents (Judith 2014, 8). In this context, this thesis focused on adolescent development's physical, psychological, social, and spiritual domains.

3.1   Adolescent physical development

Adolescent physical development encompasses physical growth, pubertal changes, sexual maturation, and the brain´s change in socio-emotional and cognitive-control systems (Waid & Uhrich 2020, 5-24).

Somatic growth burst begins distally. Enlargement starts from the hands and feet, following arms and legs, leading to the trunk and chest. Body composition changes as well. Males go through an increase in lean body mass, while females tend to have a high proportion of body fat. In the cardiovascular system, there are increased heart size, higher blood pressure, increased blood volume, and red blood cells in the blood, especially in males. Enlargement of the larynx, pharynx, and lungs leads to male voice changes. (Kliegman et al. 2020, 1015-1016.)

The biological transition from childhood to adulthood is called puberty. Even though there is variation between individuals, physical and sexual characteristics are the most noticeable change and could be predicted in adolescence. Physical changes during adolescence are mainly under the effect of the endocrine system. (Edelman, Kudzma & Mandle 2014.) As the main hormones that affect adolescents, there are oestrogen, testosterone, growth hormone, adrenal androgens, and thyroxine (FIGURE 2). As a result of these hormones, adolescents grow spurt, height increases, and muscle mass increases. Also, body fat distribution changes, and skeletal maturity and secondary sexual characteristics appear. (WHO 2014.)

A simplified diagram of the main hormonal influences on growth and the development of secondary sexual characteristics during adolescence

| Hypothalamus |
| Pituitary gland |

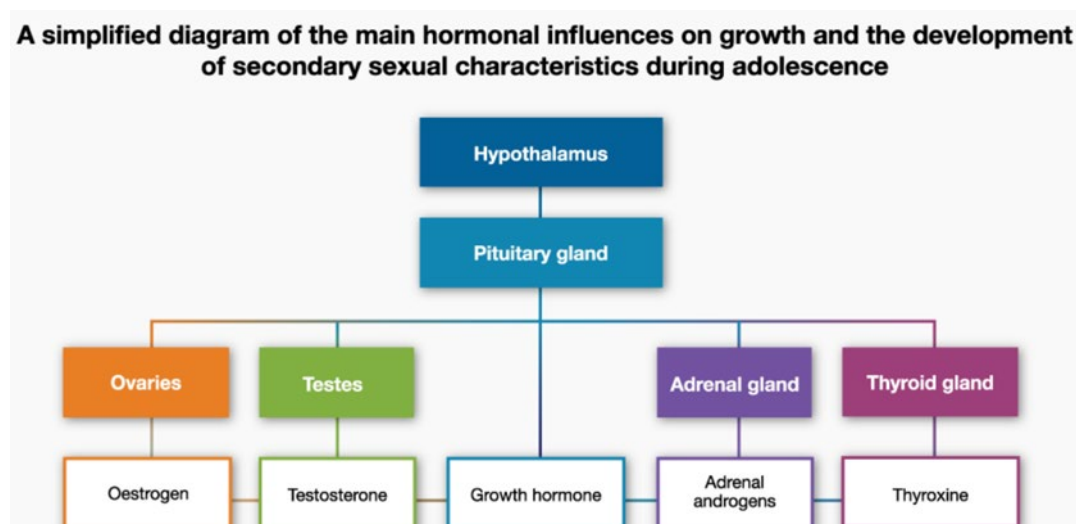| Ovaries | Testes | | Adrenal gland | Thyroid gland |
| Oestrogen | Testosterone | Growth hormone | Adrenal androgens | Thyroxine |

FIGURE 2. The primary hormone that influences adolescents (WHO 2014)

Adolescents mature primarily in sexual characteristics like menstruation in women and the capacity to ejaculate in men. Secondary sexual characteristics are auxiliary hair, breasts, and voice changes. (Carr 2016, 10.) The earliest sign in males as increasing testicular volume begins at 12 years on average. Females start to develop breast buds as the first sign of puberty. (Christie & Viner 2005, 301-304.) During puberty, the motivation and longing to engage in romantic love arose. Unlike parental love, romantic love also includes mutual power-sharing and sexual desire. The hormonal changes from puberty might affect the brain to learn about this new type of love for facilitating mating, childbearing, and childcare. (Suleiman, Galván, Harden, & Dahl 2017, 209-220.)

Discovery from neuroscientists tells that brain development is not complete before the age of twenty-five (Pimentel 2013, 73.) The central and temporal blocks of the spatial, sensory, auditory, and linguistic areas mature in the adolescent period. Consequently, the brain is prepared to take care of

several social and intellectual challenges. However, the prefrontal cortex, fundamentally related to thinking and planning, is still developing. (Figure 3.) So, in the adolescent period, the almond nucleus is mainly in charge of processing emotional information. These may have a link with impulse control and judgment issue in adolescents. (Carter, Aldridge, Page, Parker & Niemi 2009, 203.) High risk-taking, poor impulse control, and self-consciousness should not be stigmatized. Because it reflects brain changes that render an opportunity for education and social development. (Blakemore 2012).

Physical growth
- Body composition changes: Males go through an increase in lean body mass, Females tend to have a high proportion of body fat.
- Enlargement of the organs and body overall

Pubertal changes and sexual maturation
- Menstruation in women and the capacity to ejaculate in men
- Auxiliary hair, breasts, and voice changes as secondary sexual characteristics
- The earliest sign in males as increasing testicular volume begins at 12 years on average.
- Females start to develop breast buds as the first sign of puberty.

Neural development
- The central and temporal blocks associated with the spatial, sensory, auditory, and linguistic areas mature in the adolescent period.
- Prefrontal cortex, fundamentally related to thinking and planning, is still in development.

FIGURE 3. Adolescent physical development

3.2   Adolescent psychological development

Psychological flexibility is an individual's ability to respond appropriately to environmental demands and internal experiences in society (Williams, Ciarrochi & Heaven 2012, 1053-1066). An adolescent must improve skills for working in social environments to become a psychologically healthy adult (Larsen 2011). Psychological development encompasses cognitive and moral development (Steinberg 2005, as cited by Waid & Uhrich 2020, 5-24), exploration of sexual preferences, and ascription of meaning to sexual activity (Kar et al. 2015, as cited by Waid & Uhrich 2020, 5-24).

It also includes exploration, reconsideration, and commitment to one's identity (Klimstra et al. 2010, as cited by Waid & Uhrich 2020, 5-24). The adolescent has more chance to make choices based on self-definition than the child. Because decisions should be based on knowledge about self and society, identity development is the main task in adolescents. (Head 1997, 7-10.)

Autonomy is also a feature developed in adolescence, enabling interaction with the world (Shifflet, Harold, Fitton & Ahmedani 2016, 364-368). Autonomy is the ability to make independent decisions for oneself and to have those decisions respected by others (Butts & Rich 2019, 355). With autonomy, self-initiated and self-regulated behavior is possible (Cosme & Berkman 2020, 31-37). To achieve autonomy, the adolescent must claim their will. Adolescents need a proper authority that permits them to have privacy and a real sense of personal space afterward. (Crago 2016, 86-87.) In their research about adolescents, Varsamis, Katsanis, and Iosifidou proposed autonomy criteria as the sense of choice and freedom of showing what the adolescent wants and expression of opinion and ideas (Varsamis, Katsanis & Iosifidou 2022).

Cognitive development through adolescence enables an adolescent to shift from the egocentric characteristic of childhood to considering the needs and feelings of other people and being future-oriented (Kliegman et al. 2020, 1017). Sanders suggested three main areas of cognitive development. First, reasoning skill is the ability to explore a full range of possibilities inherent in a situation, thinking hypothetically and using logical thought processes. Second, as abstract thinking, it is the capacity to love, think about spirituality, and participate in more advanced mathematics. A third area, normal operational thinking allows the adolescent to develop the ability to think about what they are feeling and how others perceive them. (Sanders 2013, 354-359.)

Moral development usually accompanies cognitive development. Depending on society and interaction with others, adolescent morality could be developed with a different intention. Parents and religious or political organizations are examples that affect adolescent morality. (Kliegman et al. 2020, 1018.) According to Martins´s review, several studies used sympathy, guilt, altruism, forgiveness, and shame (FIGURE 4) to measure the moral emotions of adolescents (Martins, Santos, Fernandes, & Veríssimo 2021, 915). In another research, early adolescent social-emotional functioning was measured with the Social-Emotional Questionnaire for Children (SEQ-C), which consists of behavioral reports (Wall, Huw Williams, Morris & Bramham 2011, 301-315).

Identity
- Developed in relation with decision making as decision-making should be based on knowledge about self and society

Autonomy
- The ability to make independent decisions for oneself and respected by others, expression of opinion, and ideas
- Self-initiated and self-regulated behavior based on self-knowledge

Cognitive development
- Shift from the egocentric characteristic of childhood to considering the needs and feelings of other people and being future-oriented
- Reasoning skills: hypothetical thoughts, logical thought processes.
- Abstract thinking as the capacity to love, think about spirituality
- Normal operational thinking that allows develop the ability to think about what they are feeling and how others perceive them.

Moral development
- Depending on society and interaction with others, morality could be developed with a different intention.
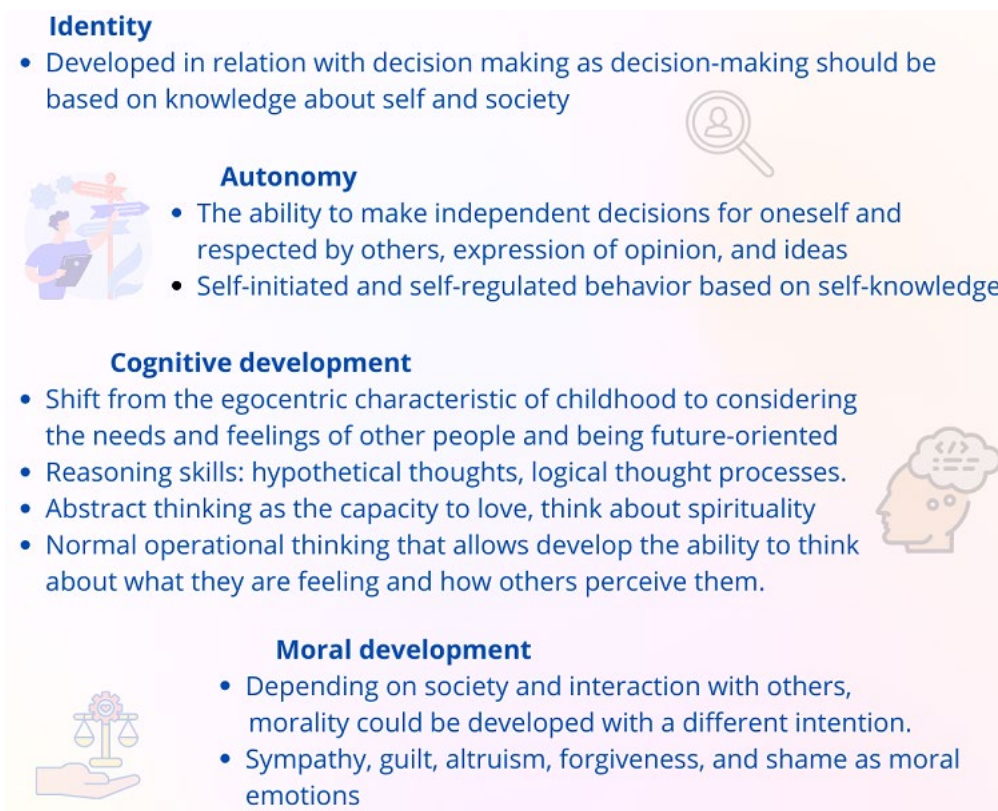- Sympathy, guilt, altruism, forgiveness, and shame as moral emotions

FIGURE 4. Adolescent psychological development

3.3   Adolescent social development

For the adolescent to achieve successful social adaptation, the capability to integrate thinking, feeling, and behavior is needed to achieve social tasks and outcomes. Without adequate social competence skills, a person may experience problems in daily living, independent living, and participating in the community. (Ruegg 2003 as cited by Agarwal & Agarwal 2018, 829-839.) Social-relational factors inevitably include individuation. Individuation is characterized by integrating psychological and social dimensions of self (Grotevant and Cooper 1986 as cited by Waid & Uhrich 2020, 5-24). Individuation could be the source of conflict for some family systems and is associated with conduct problems during adolescence and young adulthood (Sameroff et al. 2004 as cited by Waid & Uhrich 2020, 5-24).

Personality is considered as a set of behavioral traits expressed by an individual (Donnellan & Lucas 2021, 14-22). Babies are born with genetically determined potentials, which will offer individual variation and responsiveness to particular environments. This bundle of genetic possibilities is called temperament (Crago 2016, 15). Temperament and experience combined to become the basis of personality development. Through interactions with others, temperaments developed as lasting thinking, feeling, and behaving patterns. (Carr 2016, 39.) Personality plays a part in the sociality of an adolescent. The personality traits like openness, conscientiousness, extraversion, agreeableness, and neuroticism affect social interaction. (Greischel, Noack & Neyer 2016, 2307-2320.) The process of personality development is accumulative rather than being replaced. It operates by accretion (Crago 2016, 93). Therefore, even though research shows that adolescence is not the period when the most significant personality change happens, the adolescent period is an important time to support personality development. Because adolescence is when identity is formed stronger, this could often trigger confusion and negative feelings. (Milevsky 2014, 180.)

In a system of age norms, the social structure establishes time boundaries regulating the individual's passage through life (Back 2018, 99). For example, in Finland, the Parliamentary Ombudsman mentioned adolescent social rights and responsibility. About adolescents, rights and obligations are stated from age 12 to 18, such as rights about the name, religion, adaptation, right to do light work, responsibility about crime from 15 years old, driving, and compulsory education. (Infofinland 2022.)

Researchers have tried to measure adolescent social competence. Shujja et al. developed self-efficacy, sociability, adaptability, leadership, self-confidence, and social initiative as adolescents' social competence scale categories (Shujja, Malik & Khan 2015, 25). In another study, self-management, self-awareness, social awareness, relationship skills, and responsible decision-making were proved to be appropriate features (Figure 5) that measure the social competence of early adolescents (Ross & Tolan 2018, 1170-1199).

Individuation Integrating psychological and social dimensions of self

Personality
- Personality traits (i.e. openness, conscientiousness, extraversion, agreeableness, and neuroticism) affect social interaction.
- The process of personality development is accumulative

Social structure affect adolescent social development by establishes time boundaries regulating the individual´s passage through life (i.e. adolescent social rights and responsibility by law)

Merits that used to measure social competence of adolescent
- Sociability, adaptability, leadership, self-confidence, and social initiative
- Self-management, self-awareness, social awareness, relationship skills, responsible decision-making

FIGURE 5. Adolescent social development

3.4 Adolescent spiritual development

Spiritual development is considered one of the areas of adolescent development domain (UN General Assembly 1989). Spiritual health is related strongly and consistently to self-perceived personal health status (Michaelson et al. 2016, 294-303). Spirituality and religion affect mental health, with differential findings by gender (Gunnoe, Moore 2002; Boyatzis 2012). A current study suggests that spiritual development in adolescence is associated with emerging adult levels of spirituality and religiousness, which shows associations with better mental health, life satisfaction, and decreased antisocial behaviors (Barkin, Miller & Luthar 2015). Lee and Jirasek found the interaction between spiritual well-being and life satisfaction. Their study findings suggest that spiritual well-being significantly affects adolescents' gratification and quality of life. (Lee, Jirásek, 2019.)

There is a theoretical challenge that the four domains of spirituality in adolescents may not work together in an equally balanced way (Michaelson, King, Currie, Brooks & Pickett 2019, 12-18). However, relation to self, others, nature, and transcendent are the four domains (Figure 6) that researchers used to measure spirituality in adolescents (Michaelson et al. 2016, 294-303). First, spirituality in relation to self is assessed by feeling life has meaning or purpose and experiencing joy in life. Second, spirituality in relation to others is measured by the kindness and forgiveness of others. Third, spirituality in relation to the environment is quantified by feeling the connection to nature and caring for the natural environment. Fourth, spirituality in relation to the transcendent is measured by feeling a connection to a higher spiritual power and meditation or prayer (Chester, Klemera, Magnusson & Spencer 2019, 582–594.)

Adolescent spirituality

- Association with emerging adult levels of better mental health, life satisfaction, and decreased antisocial behaviors
- Spiritual well-being affects adolescents' gratification and quality of life.

Spirituality in relation to
- Self: feeling life has meaning or purpose and experiencing joy in life.
- Others: kindness and forgiveness of others.
- Environment: feeling the connection to nature and caring for the natural environment.
- Transcendent: feeling a connection to a higher spiritual power and meditation or prayer

FIGURE 6. Adolescent spiritual development

4   THE THESIS PURPOSE AND AIMS

The purpose of this thesis was to produce an E-poster that contains information on adolescent developmental stages in four domains.

This thesis aims to promote an understanding of the adolescent developmental stages in nursing students and healthcare professionals who work for adolescents.

5   DEVELOPMENT WORK

Development work requires evaluating the current situation, searching for and valuing alternatives, defining goals, and selecting means to reach the goals (Kananen & Gates 2011, 151). It works as a research method that focuses on planning, producing, and evaluating instructional products. Although developmental research is only one of several research methods that can provide practitioners with usable data, its focus on planning, producing, and evaluating products and processes is unique. (Richey & Klein 2005, 23-38.)

5.1   Planning stage of the development work

In the planning stage of development work, the endeavor was made to look for resources to answer the question, "What are the adolescent developmental stages in four domains, physical, psychological, social, and spiritual?" The literature review was based on five resources: Cinahl Complete, Science Direct, Google scholar, and books from the library of the Savonia University of Applied Science and the University of Eastern Finland. Keywords used for searching were adolescent physical development, adolescent psychological development, adolescent social development, and adolescent spiritual development. When using the Cinahl complete and Science direct database, several criteria were used to select literatures. Literatures with pathological titles written in languages other than English were excluded. Also, the publication date was set between the year 2010 and 2022 (Figure 7.). These 15 chosen articles were used either part of thesis or E-poster contents (Appendix 2). For Google Scholar and library searches, the year was not set. All databases were searched from their respective start dates until the 8th of May 2022.
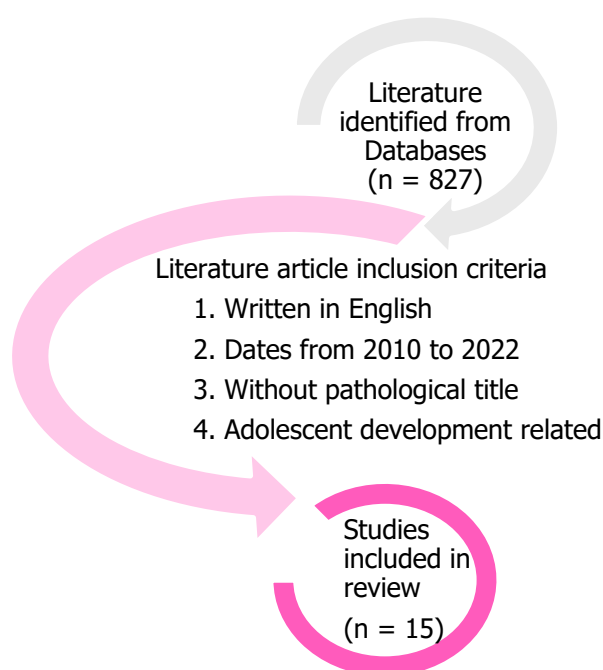
Literature
identified from
Databases
(n = 827)

Literature article inclusion criteria
1. Written in English
2. Dates from 2010 to 2022
3. Without pathological title
4. Adolescent development related

Studies
included in
review
(n = 15)

FIGURE 7. Literature selection process in Cinahl complete and Science direct

5.2   Producing E-poster

The poster helps message transmission. It is used for giving information, instruction, and inspiration. The steps for creating a poster include the development of contents – designing composition – arranging, and rearranging to foster appeal. (Duchin & Sherwood 1990, 205-208.) E-poster is the electronic format of the poster. There is no standard software for creating an E-poster, so it gives design possibilities with proper software selection. Several principles of an excellent E-poster are the same as in a poster. They are about the color choice, clear message, not too much information, and logical flow. (Masters, Gibbs & Sandars 2015, 1-9.)

The poster should be designed visually appealing to attract the audience. Content, layout, color usage, imagery, and positive and negative space for a good poster are critical (Berg & Hicks 2017, 461-469). High-quality data in pictures or graphs without an excess of words is better than excessive words in the poster (Goodhand et al. 2011, 138). Considering the aim of this development work is the promotion of understanding of adolescent developmental stages in four domains, precise contents and visual appeal are essential components for the viewer of this poster.

Google search and advice was asked from a visual graphic designer to choose the best software for a novice to make E-poster. In the end, Adobe Creative Cloud Express and Canva were chosen as software. The writer participated in four times of graphic design classes for beginners and learned how to use two software. Contents arrangement, colors, fonts, layouts, and images were changed several times during the E-poster production. The contents of the E-poster were based on the literature review. The literature review was summarized in the E-poster.

5.3   Evaluation of the E-poster

Several writers suggest a poster checklist. For example, Redulla suggested four categories of checking points. They are layout, design, color, content, grammar, spelling, and punctuation (Redulla 2021, 15). Similarly, Christenbery & Latham suggested posters to be evaluated in terms of appearance (graphics, readability of words, ease to follow) and content (purpose, importance) (Christenbery & Latham 2013, 16-23).

Based on the above idea, the chosen evaluation criteria of the poster were contents and design. A scale evaluation from 1 to 10 was used for these two categories. Number one was very poor, and ten was informative for content and excellent for design. The evaluator could choose numerically from 1 to 10. Preference among two E-posters and free comments were decided to put in the survey.

This survey was made using Webropol. Email addresses of teachers teaching paediatric nursing at the Savonia University of Applied Science were given by the supervising teacher. The feedback and comments were reflected in the E-poster design, and changes were made. One of those two E-posters was chosen and attached to this thesis as an appendix (APPENDIX 1).

6   DISCUSSION

The purpose of this thesis was to produce an E-poster that contains information on adolescent developmental stages in four domains. For the contents of the E-poster, literature review about the question, "What are the adolescent development components in four domains (physical, psychological, social, and spiritual)?" was stated as part of the thesis. With the result of the literature review, E-poster was made using chosen software. A survey about E-poster was sent to paediatric teachers at the Savonia University of Applied Science. Then feedback was reflected on the E-poster. In the end, one E-poster was selected and added to this thesis.

6.1   Evaluation of development work process and output

First, the idea for the poster containing adolescent development information came from the healthcare professionals the writer met while she was doing an internship in the adolescent care ward. So initially, the working partner was supposed to be that healthcare organization. However, the plan did not go as planned due to the writer´s life situation and environment. The writer postponed the thesis process. Later, the working partner of the thesis also changed to the Savonia University of Applied Sciences due to time concerns about thesis completion. The Healthcare organization was contacted with an apology and an explanation of the situation.

Only a small number of researches were found relating to typical adolescent development in chosen databases, Cinahl complete and Science direct, from 2010 to 2022. it was found that there is a huge difference among the four domains of adolescent development in terms of research quantity. While there is more literatures about social development, literatures of physical, psychological, and spiritual development of adolescent was less or much less. In the order of adolescent development in social, physical, psychological, spiritual – in Cinahl complete 107,41,26,3 and Science direct 350, 182, 104, 14 were the numbers of literatures.

According to the search result from those two databases, the majority of adolescent developmental researches were rather pathology related. As a result, throughout the thesis, the contents proportion from Google scholar databases, books from the library of the Savonia University of Applied Science, and the University of Eastern Finland is higher than those two databases.

Waid´s scoping review of positive youth development was beneficial in mapping the developmental features in adolescents in this thesis (Waid & Uhrich 2020, 5-24). Through the literature review, it was found that scholars have tried to measure adolescent development in each domain (Marshall & Tanner 1970, 13-23; Michaelson et al., 2016, 294-303; Shujja, Malik & Khan 2015, 25; Ross & Tolan 2018, 1170-1199; Wall, Huw Williams, Morris & Bramham 2011, 301-315).

In the process of producing the E-poster, the literature review was summarized and made as the posters using two software. There were several corrections and editing in terms of spelling, color, and fonts considering the literature review of poster design.

The evaluation process was challenging due to time shortage. As it was planned, the survey was made with Webropol with criteria of contents and design. The free comment was also asked as part of the survey. To evaluate and improve the E-poster, survey and requesting texts were sent to teachers of

paediatric and family nursing at Savonia University of Applied Sciences. The feedback was reflected in the E-poster.

This thesis is important in that it was a trial of gathering typical adolescent development stages in four domains. Several limitations are worth mentioning. First, even though the thesis process started in September 2021, the process stopped in between. As a result, the search pool of literature is narrowed. Second, there would be a limitation of the individual as a writer. Adolescent development as a thesis topic is a wide-ranging area, and it may need a professional view in each domain. Also, "A person is an integrated whole different from the sum of separate components." (Adams, Gullotta & Montemayor 1992). In this sense, four domains of physical, psychological, social, and spiritual may not be enough to understand adolescents as the whole individual.

6.2   The ethics and reliability of the thesis

The thesis writing process followed ethical recommendations for thesis writing at universities of applied sciences (ARENE) in general. For the actualization of the ethical recommendation, several endeavors were made. For example, thesis plan was discussed between the student as a writer and supervising teachers. Referencing methods were followed to avoid plagiarism. For copyrights concern, the organizations that have the copyrights of the Figures were contacted for permission to use and got approval.

Regarding resources, advice was given by the librarian from the Savonia University of Applied science about search terms and databases. Throughout the thesis writing process, supervising teachers also guided the writer in ethics and reliability. For example, when the writer got feedback about E-poster from healthcare professionals who work for adolescents, the supervising teachers corrected the writer that getting feedback to use in the thesis requires official permission. As a result, only the feedback with official permission was used in this thesis.

Reliability implies the accuracy and consistency of information obtained in a study (Polit & Beck 2018, 69). Through the writing process, the endeavor was made to include reliable information. However, due to the nature of the subject, it should be mentioned that consistency would not be strong. As Back mentioned, the human life entity course may be a human creation rather than a fact of nature (Back 2018, 159). Then the adolescent development stages could vary depending on era and place.

6.3   Professional growth

According to the Nurses Association of New Brunswick 2015, nurses have the role of collaborator, educator, advocate, manager, care provider, leader, and researcher (NANB 2015). Considering these roles of nurses, I believe this thesis writing process let me try to be a novice researcher. Being guided by supervising teachers about ethics and reliability helped me to understand ethics more. The topic itself, adolescent developmental stages in four domains, allowed me to study the subject more intensely. At the same time, searching literature related to the adolescent developmental stages in four domains renders an opportunity to follow up on some of the current researches related to the thesis topic.

Communication was a significant part of the thesis writing process. I communicated with supervising teachers, healthcare professionals who work for adolescents, librarian, visual graphic designer, and institutional secretary throughout the thesis writing. The mediums of communication were emails and zoom meetings. Writing a clear message was necessary to save time and energy. Being in a situation where I must discuss, get permission, and reply lets me improve communication skills.

6.4 Applicability and future research

In terms of applicability, this thesis work product would be used as study material for the nursing students. It would be used as a wall poster or E-poster for healthcare professionals who work for adolescents. It would be referred to in policymaking that is related to adolescents.

Future studies could be performed on adolescent development with a nonpathological view, by team works of professionals from every four domains of adolescent development.

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APPENDIX 1. ADOLESCENT DEVELOPMENTAL STAGES IN FOUR DOMAINS E-POSTER

Adolescent developmental stages in four domains

Spiritual development

Sense of connection to
self: meaning of life
others: kindness and forgiveness
nature: caring for environment
transcendent: spiritual power

Social development

Individuation that affect independence
Personality is accumulative
Social development is affected by social
structure (i.e. adolescent social right and
responsibility by law)

Psychological development

Autonomy: freedom to choice
Identity that affect decision making
Logical and abstract thinking
Moral development of sympathy, guilt,
altruism, forgiveness and shame

Physical development

Physical growth
Pubertal changes and sexual maturation
Prefrontal cortex in developing

Development is...

- rather process than state

- process that has individual differences

- cultural and historical

- the result of interaction between genes and environment

APPENDIX 2. SUMMARY OF INCLUDED LITERATURE ARTICLES FROM CINAHL COMPLETE AND SCI-
ENCE DIRECT

Articles name, author(s) & year	Main findings	Relation to this thesis
Adolescent Health Interventions: Conclusions, Evidence Gaps, and Research Priorities Rehana A. Salam, M.Sc. a , Jai K. Das, M.D., M.B.A. a , Zohra S. Lassi, Ph.D. b , and Zulfiqar A. Bhutta, Ph.D. c,d, (2016)	Potentially effective interventions for adolescent health and well-being include interventions for adolescent sexual and reproductive health, micronutrient supplementation, nutrition interventions for pregnant adolescents, interventions to improve vaccine uptake among adolescents, and interventions for substance abuse.	This article was used for pointing out healthcare professionals´ challenge related with adolescent care.
Becoming a sexual being: The 'elephant in the room' of adolescent brain development Ahna Ballonoff Suleimana, Adriana Galvánb, K. Paige Hardenc, Ronald E. Dahl a (2016)	Puberty is not simply a set of somatic changes that are critical for physical reproductive maturation. Rather, puberty also involves a set of neurobiological changes that are critical for the social, emotional, and cognitive maturation necessary for reproductive success.	This article was used to point out the motivation and longing to engage in romantic love in adolescence.
Development and initial validation of a scale for the situational recognition of the basic psychological needs Panagiotis Varsamis a, Georgios Katsanis b , Eleni Iosifidou (2017)	The construct of BPNs(Basic Psychological Needs) recognition may add value to practice in domains, such as student tertiary education, teacher support and/or trainings, student teacher mentoring/supervisions and related needs assessments.	This article was used to state autonomy criteria as the sense of choice and freedom.
Inflexible Parents, Inflexible Kids: A 6-Year Longitudinal Study of Parenting Style and the Development of Psychological Flexibility in Adolescents Williams, K. E., Ciarrochi, J., & Heaven, P. C. (2012)	Increases in authoritarian parenting and decreases in authoritative parenting (high warmth and control) were associated with adolescent psychological flexibility across the high school years. Change in parenting predicted future psychological flexibility but did not predict change over time.	This article was used to start psychological development of adolescent part, as a statement of explanation about psychological flexibility in adolescent.
Youth–Adult Connectedness: A Key Protective Factor for Adolescent Health Renee E. Sieving et.al. (2017)	There are strong, positive relationships with parents and other caring adults protect adolescents from a range of poor health-related outcomes and promote positive development. Youth–adult connectedness appears to be foundational for adolescent health and well-being.	This article was used to advocate the importance of relation between healthcare as adult and adolescent
Role of parents in the development of social competency among adolescents	Parental role is one of the main contributory factors to develop social competence among adolescents. The study reported no significant difference on social competence of government and private schools. It is found that the urban areas adolescent students	This article was used to accentuate the importance of social skills in adolescent.

	have significantly higher mean scores as compared to the adolescents of rural areas.	
Indu Bala Agarwala Prakash, Chandra Agarwalb. (2018)		
The development of a new measure of social-emotional functioning for young adolescents Wall, S. E., Huw Williams, W., Morris, R. G., & Bramham, J. (2011)	Social-emotional functioning develops dynamically rather than in a stage-like progression across early adolescence. Gender differences were evident in aspects of social-emotional functioning. New scale of the SEQ-C was designed and tested.	This article was used to introduce scale of early adolescent social-emotional functioning.
Sailing uncharted waters: Adolescent personality development and social relationship experiences during a year abroad. Greischel, H., Noack, P., & Neyer, F. J. (2016)	International mobility experiences in adolescence indeed foster maturity. Sojourners demonstrated higher pre-de-parture levels of Extraversion and Agreeableness as well as lower levels of Neuroticism. Longitudinal results indicated a steeper increase in Openness and Agreeableness trajectories, as well as a buffered increase in Neuroticism for exchange students.	This article was used to state personality traits in adolescent
A scoping review of the theory and practice of positive youth development. Waid, J., & Uhrich, M. (2020).	Positive youth development programmes are diverse and can be tailored to a range of adolescent needs spanning geographic and cultural contexts.	This article was used to state components of physical and psychological development in adolescent. It was also used to mention individuation as a development feature in adolescence.
Social and emotional learning in adolescence: Testing the CASEL model in a normative sample. Ross, K. M., & Tolan, P. (2018)	The results support viewing a slightly modified version of the CASEL(Collaborative for Academic, Social, and Emotional Learning) model as a valid, and perhaps alternative or complimentary, framework for adolescent research and practice.	This article was used to state features that measures social competence in adolescence.
Developmental patterns of adolescent spiritual health in six countries. Michaelson, V., Brooks, F., Jirásek, I., Inchley, J., Whitehead, R., King, N., ... & Pickett, W. (2016)	While the perceived importance of spiritual health declines by age, for adolescents who maintain a strong sense of the importance of self-perceived spiritual health the possible benefits are striking. connection to self (Sinats et al. 2005); connection to peers (Scholte & Van Aken 2006) and adults (Elgar, Trites, & Boyce 2010); connection to nature (Louv 2005, 2012) and a connection to the realm of transcendence have all been demonstrated to have positive health benefits.	This article was used to state spiritual health is important part of overall health status of adolescent. The four domains of spiritual development in adolescence are used in the E-poster.
Domains of spirituality and their associations with positive mental health: a study of adolescents in Canada, England and Scotland. Michaelson, V., King, N., Inchley, J., Currie, D., Brooks, F., & Pickett, W. (2019)	There are strong and consistent associations between positive mental health and higher scores for each of the four spiritual health domains. It appears that associations with connections to "others", "nature", and the "transcendent" are sometimes mediated by connections to "self".	This article was used to state the inequality of four components of spirituality in adolescent.
Filling the void: Spiritual development among adolescents of the affluent. Journal of Religion and Health	Spirituality and religion had effects on mental health, with differential findings by gender. Spirituality, religiosity, and compassion all were positively	This article was used to mention spiritual development in adolescence is associated with emerging adult

Barkin, S. H., Miller, L., & Luthar, S. S. (2015)	associated with mental health, while religious struggle was inversely associated with mental health.	levels of spirituality and religiousness, which shows associations with better mental health, life satisfaction, and decreased antisocial behaviors.
Associations between screen-based activity, spiritual well-being, and life satisfaction among adolescents. Lee, S., & Jirásek, I. (2019)	Spiritual well-being significantly affects gratification and quality of life among adolescents that reinforces the importance of the incorporation of spiritual domain into health practice and education.	This article was used to point out the relation between spiritual well-being and adolescents' gratification and quality of life.
The role of school-based health education in adolescent spiritual moral, social and cultural development. Chester, K. L., Klemera, E., Magnusson, J., Spencer, N. H., & Brooks, F. M. (2019)	Positive perceptions of PSHE (personal, social, health and economic) education were significantly associated with increased spirituality among young people, reduced engagement in both fighting and bullying perpetration and increased general self-efficacy.	This article was used to state the details of spirituality measurement in adolescent.