Original Article

Correlational Analysis of Factors Influencing Female Adolescent Motivation to Prevent Anemia Using a Self-Determination Theory Approach

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ABSTRACT

OBJECTIVE: The study utilized self-determination theory to investigate the motivations for preventing anemia in female adolescents.

METHODOLOGY: This study employed a correlational design using a cross-sectional approach. Proportional random sampling was used to select 136 female students in grade XI from a public high school in Blitar, East Java. The questionnaire used as the study instrument has been rigorously examined for validity and reliability. The data were analyzed using Spearman Rho at a significance level of α< 0.05. The independent variables include the need for autonomy, competence, and relatedness, each of which were the core elements of the self-determination theory. The study's dependent variable was motivation to prevent anemia.

RESULTS: Most adolescents were motivated to avoid anemia, while others showed sufficient drive. Female adolescents' motivation to prevent anemia was significantly correlated to their demand for autonomy (p < 0.001, r = 0.383), competence (p= 0.002, r = 0.263), and relatedness (p<0.001, r=0.359), according to self-determination theory.

CONCLUSION: Addressing female adolescents' demands for autonomy, competence, and relatedness increases their motivation to prevent anemia. These findings have practical implications for healthcare professionals and educators, empowering them to design interactive health education programs that cater to the unique needs of adolescent development and emphasize the importance of self-determination in anemia prevention.

KEYWORDS: Adolescent, Anemia, Autrition, Prevention behavior, Motivation.

INTRODUCTION

Anemia, a hematological disorder in which hemoglobin levels fall below normal, is still common among adolescents[1]. Menstruation occurs every month in female adolescents as a result of the degradation of the uterine lining produced by the hormones estrogen and progesterone, which fluctuate in levels toward the conclusion of the cycle, resulting in blood loss that can be interpreted as regular iron loss[2]. Adolescents' present diets need to match their nutritional demands, particularly iron. Inadequate iron intake can cause anemia[3]; this is one of the primary focuses, as adolescents risk getting anemia[4]. Menstrual patterns, poor food, worm infections, drinking tea or coffee after meals, sleep duration, a lack of vitamin C consumption, and economic considerations are significant causes of anemia in adolescents[5]. This can create a variety of substantial difficulties in adolescents, including feeling weak, sleepy, lethargic, having a pale complexion, dizziness, poor focus, impeding physical growth and mental intelligence, and lowering work productivity[6]. In addition to the risk of becoming a pregnant woman with anemia, there is a risk of mortality during childbirth, early birth, and LBW if not addressed immediately[7]. In 2019, the global prevalence of anemia in women of reproductive age was 29.9%, affecting over half a billion women aged 15 to 49 years[8].In Indonesia, the situation is equally alarming, with a high prevalence of anemia in female adolescents, namely 25% and 17% in childbearing women, resulting in an 11.8% increase in anemia in pregnant women. These statistics underscore the urgent need to address anemia[9], particularly among female adolescents, to prevent its adverse health effects.

The government is intensifying several strategies to reduce the incidence of anemia in teenagers as early as possible through education on balanced nutrition, which refers to the PGS book issued by the Ministry of Health[10]. However, the role of healthcare professionals, educators, and researchers is crucial in implementing these strategies and ensuring adolescents have the necessary knowledge and resources to prevent anemia. These strategies include blood supplemental intake tablets provided by healthcare providers, educational institutions,

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workplaces, and other places of worship, food fortification, especially those containing iron and folic acid, and treatment of comorbidities such as CED, worms, malaria, tuberculosis, and HIV/AIDS[11].

Adolescents around 12 to 18 participate in the self-ego battle to attain a favorable identity balance over identity confusion. Adolescents desire to be independent and take responsibility for their actions and behavior, often known as the search for self-identity[12]. Teenagers who cannot develop have an unstable sense of self, do not prepare for the future and are insecure[13]. Self-concept, in general, is a picture of all parts of an individual's personality based on the individual's views, perceptions, thoughts, feelings, and beliefs about him or herself, leading to respect and acceptance of themselves. As a result, psychological considerations are one of the aspects that influence people's willingness to engage in desired activities[13]. According to one study, youth still need a basic understanding of anemia and its prevention, and, despite their favorable attitudes, preventive measures still need to be implemented in everyday life[14]; this arises because youngsters' desire to carry out prevention remains low. These findings are consistent with previous research, which indicated that teenagers continue to lack the motivation to consume Fe tablets, even though this activity is one of the ways to prevent anemia[15].

Self-determination theory (SDT) is a comprehensive framework for studying human motivation and personality. SDT describes a meta-theory that summarizes motivation research by outlining the sources of intrinsic motivation and the various extrinsic motivation[16]. This theory also explores how intrinsic and extrinsic motivation influence cognitive and social development, as well as individual differences. SDT also explains that motivation is influenced by three basic psychological needs: 1) autonomy, or the ability to determine one's behavior; 2) competence, or the ability to negotiate and control resources and good outcomes, internal or external; and 3) relatedness, or the extent to which a person is connected and accepted by others[17]; this can lead to greater motivation and participation in activities such as improved performance, persistence, and creativity. The study explored factors correlated with motivation to prevent anemia in adolescents utilizing self-determination theory.

METHODOLOGY

Research Design

The research design is *cross-sectional*, where the data are collected at once. The study was conducted at a public senior high school in Blitar, East Java. The school has implemented a program for distributing blood supplement tablets every week; however, adolescents' knowledge about preventing anemia still needs to be improved.

Participant and setting

The population consisted of female class XI students, and the sample size was 136 respondents using the Slovin formula, selected by proportional sampling. The sample is representative of the entire class.

Data Collection Process

Data were collected using a Google Forms questionnaire. The instruments utilized in this study were previously validated for validity and reliability. The demographic questionnaire in the study contains demographic data for adolescents, such as age, class, parents' occupation, and parents' latest education.

Instruments

The study employed a questionnaire based on BPNS-NF, which has functions consistent with the study. Deci and Ryan developed the BPNS-NF (Basic Psychological Needs Satisfaction-Needs Frustration Scale)[17]. Based on self-determination theory, this questionnaire examines the satisfaction of three core psychological needs: autonomy, competence, and relatedness. The questionnaire scale is organized in Likert form and divided into five categories: Favorable: Strongly Agree score 5, Agree score 4, Doubtful score 3, Disagree score 2, Strongly Disagree score 1; Unfavorable: Strongly Agree score 1, Agree score 2, Undecided score 3, Disagree score 4, Strongly Disagree score 5. The results are interpreted as follows: needs are met if ≥ 50%, not met if < 50%.

Motivation to prevent anemia was measured using the TSRQ questionnaire because the function of the questionnaire is equally related to health behavior that is in line with avoiding anemia. The TSRQ, or *Self-Regulation Questionnaire*, was developed by Ryan and Connell in 1989. This questionnaire assesses an individual's level of motivation or self-regulation related to changing health behavior, including the extent to which this behavior is driven by intrinsic and extrinsic motivation. This questionnaire asks why a person carries out or will carry out healthy behavior, undergo treatment for a specific disease, try to change unhealthy behavior, participate in a treatment program, or carry out other health-related behavior. The scale consists of 15-20 items grouped into four factors of self-regulation toward treatment: intrinsic regulation, introjected regulation, external regulation, and non-regulation.

The questionnaire scale is in Likert form and divided into five categories: Strongly Agree (5), Agree (4), Doubtful (3), Disagree (2), and Strongly Disagree (1). The results are interpreted as follows: strong motivation (≥51), sufficient motivation (26-50), and low motivation (≤25). The researcher used everyone's fundamental rights when collecting data. Humans have the right to self-determination; research must protect human freedom.

Data Analysis

Data were analyzed using descriptive and inferential statistics. Descriptive analysis uses frequency distribution data from demographics and factors. The Spearman Rho correlation test, with a significance level of $\alpha=0.05$, is used in inferential analysis to explain variable correlations.

RESULTS

Based on **Table I**, the characteristics of the respondents showed the majority of respondents were aged 17, with 92 students (67%). Female students in class XI-2 provided 21 (15.44%) responses. The respondents' parents' jobs were dominated by private sector workers, with 47 (34.55%) working for their father and 70 (51.47%) working for their mother. The respondents' parents' most significant level of education was tertiary, with fathers at 66 (48.52%) and mothers at 73 (53.67%).

Based on **Table II** shows the data analysis of the correlation between the demand for autonomy and the motivation to prevent anemia in adolescents, revealing $p < 0.001$ and $r = 0.383$. The p-value was smaller than 0.05, indicating that H1 is accepted. This study's findings suggest a correlation between the need for autonomy and motivation to prevent anemia in female adolescents. It can be performed at a moderate level.

The data analysis on the correlation between the need for competence and motivation to prevent anemia in young women revealed results of $p=0.002$ and $r= 0.263$, respectively; the r value is less than 0.05, indicating that H1 is accepted. The study's findings suggest a link between the demand for competence and motivation to prevent anemia in young women. The coefficient value of 0.263 can be taken as a weak correlation. This correlation was positive, indicating that the correlation between the need for competence and motivation to prevent anemia is in the same direction, implying that the more the need for competence is met, the greater the incentive to avoid anemia in young women.

Data analysis of the correlation between needs and motivation to prevent anemia in young women obtained $p < 0.001$ and $r = 0.359$. The p-value is smaller than 0.05, indicating that H1 is accepted. This study's findings suggest a correlation between the demand for relatedness and motivation to prevent anemia in young women. It can be taken as a moderate level.

Table I:
Data on respondents' characteristics (n=136)

Characteristics	Category	f	%
Age (years)	15	2	1.47
	16	34	25
	17	92	67
	18	8	5.88
Father's Occupation	civil servants	44	32.35
	Private	47	34.55
	Traders/Farmers	11	8.08
	Other	34	25
Mother's Job	civil servants	30	22.05
	Private	28	20.05
	Traders/Farmers	8	5.88
	Other	70	51.47
Father's Education Level	Elementary School	2	1.47
	Junior High School	6	4.41
	Senior High School	62	45.58
	Higher Education	66	48.52
Mother's Education Level	Elementary School	2	1.47
	Junior High School	11	8.08
	Senior High School	50	36.76
	Higher Education	73	53.67

DISCUSSION

Most female adolescents are strongly motivated to prevent anemia. However, some adolescents are only sufficiently motivated to avoid anemia. Adolescents must anticipate anemia because they function as women of productive age in preparing for the future generation[18]. The need for autonomy and motivation to prevent anemia correlated moderately and positively. Some young women who have met their autonomy requirements are highly motivated to avoid anemia. Others demand autonomy, which is fulfilled with minimal motivation to prevent anemia. On the need for autonomy variable, the majority of

Table II: Correlation of the need for autonomy, competency, and relatedness with motivation to prevent anemia in adolescents

Variable Self-Determination Component		Motivation to Prevent Anemia				Total		Spearman Rho Test	
		sufficient		strong					
		f	%	f	%	n	%	*r*	*p*
Need for Autonomy	Not fulfilled	0	0	2	1.5	2	1.5	0.38	< 0.001
	Fulfilled	35	25.7	99	72.8	134	98.5		
Need for Competency	Not fulfilled	5	3.7	10	7.4	15	11	0.26	0.002
	Fulfilled	30	22.1	91	66.9	121	89		
Need for Relatedness	Not fulfilled	3	2,2	1	0.7	4	2.9	0.35	< 0.001
	Fulfilled	32	23.5	100	73.5	132	97.1		

respondents selected "strongly agree" for statements regarding the freedom to make decisions and the ability to do anything they choose. However, most respondents said they "agree" with comments regarding having choices. In the motivation variable for preventing anemia, most respondents selected "agree" for statements regarding autonomous regulation and remarks about introject regulation. However, most respondents responded "doubtful" to assertions about external regulation and "strongly disagree" with motivation comments.

One of the most fundamental psychological demands is autonomy, which is the belief that one has a choice and others will support one's actions[19]. Adolescents have a drive for independence, which motivates them to prevent anemia. Motivation is a set or capacity of action that gives a foundation for acting in a manner geared toward specified goals[20]. Young women are more motivated to practice self-regulation. The series chart of forms of motivation in self-determination theory shows that autonomous regulation is proportional to intrinsic motivation[21]. Intrinsic motivation is the innate desire in humans to seek out new experiences and challenges, to extend and train their abilities, and to explore and learn[22]. A weak but favorable association exists between the need for competence and the drive to prevent anemia. The findings indicate that most young women with addressed competency needs are highly and moderately motivated to avoid anemia. Others have unmet competency needs but are highly or moderately motivated to prevent anemia. Most respondents chose "strongly agree" to comments about the magnitude of the competency needs variable. Most respondents said they "agree" with comments concerning generality and strength. In the motivation variable for preventing anemia, most respondents selected "agree" for statements regarding autonomous regulation and remarks about introject regulation. However, most respondents responded "doubtful" to assertions about external regulation and "strongly disagree" with motivation statements.

According to self-determination theory, competency needs to refer to the sense of mastery and effectiveness in one's actions[23]. The need for competency motivates every adolescent to prevent anemia. In this study, young women are more motivated toward autonomous regulation. There is a link between the requirement for competence and motivation to avoid anemia. This means that the more competency needs are addressed, the greater the drive to prevent anemia in young women. Fulfilling these basic requirements fosters optimal motivational qualities, autonomous motivation, and intrinsic desire, all enhancing psychological health and successful interaction with the world[24]. However, there are still many young women whose competency needs still need to be fulfilled. Thus, it is critical to give health promotion/education, particularly on healthy, anemia-free lifestyles that focus on increasing teenagers' confidence and ability to prevent anemia.

A moderate and positive association exists between the demand for relatedness and the drive to prevent anemia. The findings indicate that certain young women whose relatedness requirements have been addressed are motivated to avoid anemia. Others had met their relatedness demands despite their moderate motivation to prevent anemia. Regarding the need for autonomy variables, most respondents selected "strongly agree" to comments about family and friends. However, most respondents replied "doubtful" to remarks about health staff. In the motivation variable for preventing anemia, most respondents selected "agree" for statements regarding autonomous regulation and remarks about introject regulation. However, most respondents responded "doubtful" to assertions about external regulation and "strongly disagree" with motivation comments.

In self-determination theory, one of the basic psychological needs is relatedness, which refers to the desire to feel linked and belong to others. Every adolescent in senior high school understands the need for autonomy, which motivates them to prevent anemia. In this study, young women are more motivated toward autonomous regulation. Young women are more motivated to prevent anemia when their autonomy needs are addressed. Fulfilling these basic requirements fosters healthy motivational qualities and states of autonomous motivation and intrinsic aspiration, which improve psychological health and engagement with the environment[2526]. There are young women whose relatedness needs to be addressed, particularly in relationships with healthcare providers. As a result, professional health workers must assist young women by gaining their trust to provide them with easy access to information about anemia prevention that they require, as well as by forming partnerships/collaborating with student organization units or schools to carry out health promotions that include checking Hb levels once a semester.

The limitation of this study is that it used a cross-sectional methodology, which only allowed for inferences about the degree and direction of the association between the variables assessed. The study only included adolescents from one public school. All constructs were assessed entirely by self-report, subjective and susceptible to desirability and mood bias.

CONCLUSION

Based on self-determination theory, young women who have had their autonomy, competence, and relatedness demands addressed are more motivated to prevent anemia. Adolescents must raise awareness about the need to prevent anemia from preparing for their part in a woman's reproductive cycle. They must also develop skills and knowledge in planning and selecting a suitable lifestyle, such as foods high in iron and folic acid.

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AUTHOR CONTRIBUTION

Nurani AY: Conceptualization, Investigation, Methodology, Validation, Review & Editing;
Armini NKA: Conceptualization, Data Curation, Formal Analysis, Methodology, Validation, Visualization, Writing – Original Draft, Review & Editing;
Hidayati L: Conceptualization, Methodology, Formal Analysis, Validation, and Writing – Original Draft, Review & Editing;
Triharini M: Methodology, Visualization, Writing – Review & Editing, and Supervision

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