



APPLICATION OF WEIDENBACH AND LEVINE'S CONSERVATIVE THEORY TO ASSESSMENT ABNORMAL UTERINE BLEEDING WITH HYPOVOLEMIC SHOCK

Yayu Handayani Syaidar Putri^{1*}, Windy Natasha², Restuning Widiasih¹

¹Faculty of Nursing, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM.21, Hegarmanah, Sumedang, West Java 45363, Indonesia

²RSUP Dr. Hasan Sadikin Bandung, Jl. Pasteur No.38, Pasteur, Bandung, West Java 40161, Indonesia

*yayu23003@mail.unpad.ac.id

ABSTRACT

Abnormal uterine bleeding (AUB) is a broad term for changes in the regularity, duration or volume of menstrual bleeding. Physical and psychological problems that PUA patients may experience and emergency complications such as hypovolemic shock. Nursing actions that can be taken for PUA patients include comprehensive assessment management. The purpose of this study was to describe the nursing assessment of PUA patients using Levine's conservation theory approach combined with Weidenbach's theory. This study uses a case study method with a focus on the application of Wiedenbach and Levine's theory in providing assessment of PUA patients with anxiety and monitoring physical and psychological aspects. The case studied involved a 15-year-old adolescent with PUA presenting with hypovolemic shock. By applying Wiedenbach's and Levine's conservative theories, nurses can conduct a comprehensive assessment of mothers of PUA patients with hypovolemic shock.

Keywords: assessment; hypovolemic shock; levine theory; weidenbach theory

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INTRODUCTION

Abnormal uterine bleeding (AUB) is a broad term for changes in the regularity, duration or volume of menstrual bleeding (Munro et al., 2018). In adolescence, AUB, previously known as dysfunctional uterine bleeding, is classically defined as excessive, prolonged, or frequent bleeding of uterine origin that is not caused by pregnancy or pelvic or other systemic disease (Bravender & Emans, 1999). This complaint is very common during the first 3-5 years after menarche, heavy menstrual bleeding is estimated to affect up to 37% of adolescent girls (FRIBERG et al., 2006). Abnormal uterine bleeding (AUB) is one of the most common conditions seen in routine obstetrics and gynecology practice, affecting approximately 10%–30% of women of childbearing age over 35 years. It has been reported that more than 50% of women with AUB do not seek medical attention, this causes a decrease in quality of life and productivity and affects the perinatal outcomes of pregnant women with a history of anemia due to AUB.

The prevalence of abnormal uterine bleeding among women of reproductive age is estimated internationally to be between 3% and 30%, with a higher incidence occurring around the time of menarche and perimenopause. There is limited research on heavy menstrual bleeding, but if

women experience irregular menstruation and bleeding occurs during menstruation (the intensity of menstrual blood is greater and the time is longer), then the prevalence rate of heavy menstrual bleeding is 35% or greater (Munro et al., 2018). Nearly 30% of women will seek medical help for this problem during their reproductive years (Munro et al., 2018).

The prevalence of PUA in Indonesia has not been reported with certainty, but it is known to occur around 20% in the adolescent age group, and 50% in the 40-50 year old group (Munro et al., 2018). One of the studies conducted in one of the West Java hospitals, at the Obstetrics and Gynecology Polyclinic, RSUD Islam Harapan Anda, Tegal City showed that the majority of respondents were at high risk age, namely 20-35 years, with a total of 37 respondents (67.3%). In women of reproductive age, the prevalence of PUA is estimated to range between 10-30% (Munro et al., 2018). In one of the hospitals in Indonesia, in the city of Surabaya, Dr Ramelan Naval Hospital Of the 82 PUA cases, the highest proportion of women suffering from PUA were in the 41-50 year age group, namely 40 cases (48.8%). The age group <20 years recorded 6 cases (7.3%), 21-30 years recorded 11 cases (13.4%), and 31-40 years recorded 25 cases (30.5%) (Wardani, 2017). Based on area of origin, most PUA sufferers come from or live in the city of Surabaya, namely 74.4%, while those from outside the city of Surabaya are 25.6% (Wardani, 2017). PUA can disturb a woman physically, socially and emotionally. This can be seen in women with unexpected heavy bleeding that can disrupt their daily activities, because they need to change pads or tampons continuously, and have concerns about social activities and sexual relations. Based on these data, there is a significant number of PUA sufferers, so appropriate nursing assessments are needed (Albin & Handayani, 2023).

The physical and psychological disturbances in PUA patients require nurses to think holistically in physical and psychological assessments. Assessment can be carried out based on nursing concepts, one of which is Levine's conservative theory. There are four aspects, namely energy conservative, structural integrity conservative, personal integrity conservative, and environmental conservative (Levine, 1967, 1996). Levine's theory aims to conserve energy, a balance must be established between adequate rest, nutrition and exercise, to maintain structural integrity, physical damage must be prevented and recovery must be accelerated, to maintain personal integrity, the person must approve and believe in his own uniqueness, and to maintaining social integrity, individuals must be respected as social beings. This involves recognizing the presence of human interaction and in particular the importance of individuals to others (Levine, 1967, 1988, 1996). Therefore, this theory can include physical and psychological aspects for the assessment of patients with PUA.

The impact of PUA can cause hypovolemic shock in patients if bleeding occurs continuously (Cheong et al., 2017). Apart from the need for assessment and monitoring, management is also needed to prevent worsening or morbidity in PUA patients. The role of nurses as caregivers has the task of preventing mortality by carrying out emergency management effectively. One of the theories underlying emergency problems is Weidenbach's theory (Alligood, 2017). Weidenbach's theory has no stages of nursing concepts, namely the identification, administration stage, and evaluation stage (Alligood, 2017). Based on the problem of emergency and the need for continuous patient monitoring, the author aims to describe nursing assessment based on a combination of Weidenbach and Levine theories as the basis for nursing assessment in PUA patients with hypovolemic shock.

METHOD

This study used a case study method with a qualitative descriptive approach to explore the experiences of patients with abnormal uterine bleeding (AUB) and to apply Levine's conservation theory along with Weidenbach's theory in nursing assessment. The sample consists of individuals experiencing AUB, particularly focusing on those presenting with complications such as hypovolemic shock. Data collection involves in-depth interviews, observations, and documentation of medical records to comprehensively assess physical and psychological symptoms with nursing care approach. The study aims to understand how nurses can utilize Levine's and Weidenbach's theories to conduct thorough assessments, particularly in cases involving adolescents like the 15-year-old with AUB and hypovolemic shock studied here.

RESULT

The patient was born in 2008 and is 15 years old. The first patient had menstruation when she was 12 years old and was not married. The patient came on February 25 2024 with complaints of heavy and clotted bleeding from the birth canal since 1 day before entering the hospital. Bleeding soaked 2 diapers. Complaints of bleeding outside the menstrual cycle were acknowledged after 3 months of SMRS. Bleeding complaints have been recognized since December 28 2023 and have not stopped until now. Complaints of regular, heavy menstruation and wetting pads 4-5 times a day for 4-5 days have been recognized since 1 year of SMRS. The patient denied a history of fever. The patient's history of being treated by SpOG in January and February 2024, it was said that there was thickening of the uterine wall. The patient received a blood transfusion and blood-blocking injection. The patient was also given Yasmin pills from December to January, but because there was no change, the patient did not continue taking the medication. Complaints accompanied by abdominal pain were denied. The patient denied complaints of bleeding gums, nosebleeds and bruises on the skin. Complaints of shortness of breath denied. Denied complaints of a lump in the stomach. Complaints about defecation and urination were denied. Drastic weight loss is denied. History of chronic diseases such as hypertension, asthma, diabetes and heart disease. Family history of malignancy was denied. Because of his complaint, the patient went to RSHS for treatment.

On arrival, the patient's vital signs were blood pressure 87/54 mmHg, pulse 143x/minute, respiration 24x/minute, temperature 36.4 C, SpO2 95% room air, height 140 cm, weight 45 kg, and body Mass Index 22.9 kg/m² (normoweight). The patient's conjunctiva is anemic, there are no complaints. There were no ptechia or purpura. Capillary Refill Time <2 minutes. No inspection or internal examination was carried out. iRecta touch shows that the anal sphincter is strong, the ampulla is not collapsed, there is no palpable mass, there is no pain, there is no bleeding. Laboratory results on arrival (25/02/2024) hemoglobin (HB) 2.5 gr/Dl, platelets 2000 103/ μ l, antidengue IgG Reactive, and antidengue IgM Non Reactive. Ultrasonography (USG) results in emergency, transabdominal retroflexed uterus homogeneous density measuring 7.19x 3.47cm, Endometrial Line (EL) (+) thickness 0.97 cm. The patient's adnexa were within normal limits, right kidney: pelvocalyceal system within normal limits, measuring 8.72 x 3.65 cm, left kidney: pelvocalyceal system within normal limits, measuring 7.97 x 3.79 cm, and there was no free fluid. The provisional diagnosis is hypovolemic shock (improvement) et causa abnormal uterine bleeding (POA0L0M0 C000*E1*I0N0); endometrial hyperplasia; anemia gravis dd/ dengue shock syndrome dd/ ITP.

At the time inThe Emergency Department (IGD) was given a loading of 500 cc of Ringer's lactate, so that blood pressure was 102/48 mmHg, pulse 126x/minute. A 3 lpm nasal cannula

was given so that the SpO₂ was 100%. Transfused 4 flasks of Packed Red Cells (PRC) and 8 flasks of Platelet Concentrate (TC). The results dated 02/26/2024 showed hemoglobin 5.2 g/dL, hematocrit 15.1%, leukocytes 1,030 10³/μl, and platelets 2000 10³/μl. Thorax x-ray examination did not show bronchopneumonia/pneumonia and did not show cardiomegaly. On 02/27/24 laboratory results showed hemoglobin 6.6 g/dL, hematocrit 19.4%, leukocytes 1,090 10³/μl, and platelets 2,000 10³/μl. After that, 2 flasks of Packed Red Cells (PRC) and 5 flasks of Platelet Concentrate (TC) were given a transfusion. On 29/02/24 hemoglobin 8.9 g/dL, hematocrit 25.7%, leukocytes 1.300 10³/μl, and platelets 4,000 10³/μl. An ultrasound examination of the genitalia was also carried out with the results of a solid lesion filling the intralumen of the urinary bladder which was not certain to be a bladder mass. The bilateral renal ultrasound is currently within normal limits. Apart from that, Photo Bone Age with Bilateral Manus (Bone Age) with the results of the bones that form the wrist joint corresponds to the age of 15 years (according to the Greulich-Pyle method).

Laboratory examination was carried out again on 02/03/2024, hemoglobin was 7.5 g/dL, hematocrit 22.1%, leukocytes 1,300 10³/μl, and platelets 3,000 10³/μl. there was a decline again in hemoglobin, hematocrit, and platelets. On 04/03/2024 the laboratory results for hemoglobin were 5.1 g/dL, hematocrit 15.2%, leukocytes 0.180 10³/μl, and platelets 2,000 10³/μl. Differential Count (DC) examination of 0% neutrophils, 4% lymphocytes, 0% monocytes, 20% eosinophils, 64% basophils, 8% stab neutrophils, and 4% neutrophils. Lab results MCV (Mean Corpuscular Volume) 82.2 femtoliter (fL), MCH (Mean Corpuscular Hemoglobin) 27.6 picograms, MCHC (Mean Corpuscular Hemoglobin Concentration) 33.6 grams per deciliter (g/dL). Lab examination PT (Prothrombin Time) 22.6 seconds, aPTT (Activated Partial Thromboplastin Time) 49.40 seconds, and INR (International Normalized Ratio) 1.63. current blood sugar results were 74 mg/dL. Lactic acid electrolyte laboratory results 4.0mmol/L, urea 41.8 and creatinine 2.8, Sodium (Na) 137 mmol/L, Potassium (K) 4.3 mmol/L, and Calcium (Ca) 3.27 mmol/L.

DISCUSSION

In these cases, patients have not yet carried out a holistic assessment.

In the case described, the patient arrived in shock, characterized by blood pressure 87/54 mmHg, pulse 143x/minute, respiration 24x/minute, SpO₂ 95% room air. Laboratory results of hemoglobin (HB) 2.5 gr/Dl, platelets 2000 10³/μl. Therefore, effective assessment is needed to prevent hypovolemic shock. Weidenbach's theory is a concept that can be used in emergency situations (Rahmawati, 2022). After the emergency situation is resolved, an assessment is needed to maintain the patient's condition. After an emergency, apart from the physical impact, the psychological aspect will also be affected. To see it comprehensively, an assessment is needed that is tailored to physical and psychological aspects. One of the nursing concepts that has physical and psychological aspects is Levine's conservation nursing model concept. Ernestine Wiedenbach's theory, called "The Need For Help", looks at all aspects involved in the scope of nursing care, including aspects of the patient, caregivers, and the social environment surrounding health services. By applying this theory, it is hoped that we can thoroughly understand the various related aspects and solve problems faced by patients, especially in emergencies, quickly and accurately. This is done by recognizing the patient's emergency needs, utilizing patient support resources, and assessing whether the assistance provided is appropriate to the patient's actual needs (Alligood, 2017). The elements in Weidenbach's conceptual model are the agent, the recipient, the goal, the means, and the framework (Eichelberger, 2015). In the nursing model method there are three stages, namely the identification stage, administration stage and evaluation stage (Alligood, 2017). During the assessment, the nurse can focus on the identification stage. At the identification stage,

based on cases of abnormal uterine bleeding with hypovolemic shock, it can be assessed based on signs of shock.

Shock monitoring variables may include continuous recording of blood pressure, heart rate, and respiration; measurement of oxygen saturation, end-tidal CO₂ and urine output, and continuous electrocardiography (Kashani et al., 2022). In addition, classify the degree of hypovolemic shock as seen in table 1 (Mutschler et al., 2014). Determining shock classification as a determinant of subsequent shock management. Apart from that, it can also be seen from the amount of bleeding. In PUA patients, bleeding can be seen from the use of sanitary napkins. The volume of bleeding can be described as heavy (more than 80 mL), normal (5 to 80 mL), or light (less than 5 mL blood loss) (Davis E & Sparzak PB, 2023). Precise volume measurements are difficult to determine therefore, detailed questions regarding the frequency of daily dressing changes, clot size, the need to change dressings at night, and the “flooding” sensation are important (Cheong et al., 2017).

Table. 1
The Advanced Trauma Life Support (ATLS®) classification of hypovolemic shock.

	Class I: Mild Shock	Class II: Moderate Shock	Class III: Severe Shock	Class IV: Irreversible Shock
Blood loss in %	<15	15-30	30-40	>40
Pulse	<100	100-120	120-140	>140
Blood pressure	Normal	Normal	Decrease	Very down
Pulse pressure	Normal or increased	Decrease	Decrease	Decrease
Respiratory rate	14-20	20-30	30-40	>35
Mental status	A little anxious	A little anxious	Anxious, confused	Confused, lethargic
Urine output (mL/hour)	>30	20-30	5-15	Minimal

Hypovolemic shock is a condition resulting from the loss of 15% or more of the body's blood or fluid supply. Unlike hemorrhagic shock, which results from trauma and blood loss, hypovolemic shock can result from dehydration, diarrhea, and other conditions that cause fluid loss, but not blood loss (Lier et al., 2018). In hemorrhagic shock, anemia, that is, a lack of erythrocytes, is also decisive (Lier et al., 2018). Trauma can be a cause of both forms of shock. Traumatic hypovolemic shock is caused, for example, by burns or scalds with corresponding fluid loss. Traumatic hemorrhagic shock involves blood loss and extensive tissue damage, for example, following polytrauma. Pure hemorrhagic shock occurs, for example, when only large blood vessels are exposed due to a knife wound with little tissue damage (Lier et al., 2018).

Table 2.
Formula for Determining Hypovolemic Shock

Shock index (SI) name variation	Equations	Notes
SI	HR/SBP	
Modified SI (MSI)	HR/MAP	MAP substituted for SBP
Age SI	Age × (HR/SBP)	SI multiplied by patient's age
Shock Index Pediatric Adjusted (SIPA)	(HR/SBP)	The formula for SI is the same. Cutoffs are different for each age group: ○ Ages 4–6: >1.22 ○ Ages 7–12: >1.0 ○ Ages 13–16: >0.9

* heart rate (HR), systolic blood pressure (SBP), mean arterial pressure (MAP) (Koch et al., 2019).

In addition to SI, there are also modified SI (MSI) [HR/mean arterial pressure (MAP)] and age SI (age × SI) that have been proposed as ongoing efforts to improve the prognostic value Table 2. MSI developed to include MAP, not just SBP, because DBP is also used to assess the severity of clinical disease (Zarzaur et al., 2008). Age × SI has been shown to better reflect mortality rates in geriatric patients (Torabi et al., 2016). The age-adjusted shock index (SIPA) was developed for the pediatric population and has been shown to be more reliable than the standard for adults (Koch et al., 2019). The shock index value according to research does not yet have a clear cut off value (Liu et al., 2012). Various studies have used different shock index cut-off values, but the commonly used value is 0.9 in patients with serious conditions (Liu et al., 2012). In research conducted by Liu et al., (2012), neither a shock index >0.9 nor <0.5 was an independent predictor of mortality in emergency department patients. This research data only comes from one hospital, so prospective research is needed to confirm these results. The most important assessment of shock is to assess the patient's pulse and blood pressure. If the pulse increases and blood pressure decreases, this is something you should always be aware of (Liu et al., 2012).

Apart from that, it is necessary to check laboratory parameters such as hemoglobin examination, blood gas analysis, rapid value of prothrombin time, aPPT, platelet count, electrolytes and blood type (ASA, 2015). When hypovolemic shock occurs and the volume status continues to decrease, especially when it reaches 25 to 30% of the effective blood volume, the patient experiences a state of shock characterized by a decrease in systolic blood pressure, tachycardia and oliguria (Levy et al., 2003). As a result, oxygen delivery to vital organs cannot meet oxygen needs. Next, cells switch from aerobic to anaerobic metabolism, resulting in lactic acidosis. Increased sympathetic drive causes blood flow to be diverted from other organs to maintain circulation to the heart and brain. This diversion exacerbates tissue ischemia and exacerbates lactic acidosis (Jentzer et al., 2022). If left untreated, this condition will cause hemodynamic compromise, refractory acidosis, and further reduction in cardiac output, ultimately leading to multiorgan failure (MOF) and death (Gayet-Ageron et al., 2018).

Table 3.
Emergency Calculation Based on Formula Modified Early Warning Score (MEWS).

	3	2	1	0	1	2	3
Systolic Blood Pressure (MmHg)	<70	70-80	81-100	101-199		≥200	
Heart Rate (Bpm)		<40	40-50	51-100	101-110	111-129	≥130
Respiratory Rate (Bpm)		<9		9-14	15-20	21-29	≥30
Temperature (c)		<35		35-38.4		≥38.5	
AVPU Score				Alert	Reacting To Voice	Reacting To Pain	Unresponsive

*Each component of MEWS has an associated score ranging from 0 to 3, based on the degree of derangement of the parameter. The total score is the sum of each component: the maximum possible score is 14.

Determination of the Modified Early Warning Score (MEWS) is a clinical scoring tool used to monitor the condition of patients in hospitals to detect early signs of serious deterioration (Khan et al., 2021). For PUA patients, MEWS is needed for effective assessment to detect early signs of serious deterioration. MEWS can be an assessment tool for PUA patients to prevent deterioration of the condition.

Table 4.
Fluid Requirements

<p><u>Fluid calculation Fluid needs for 24 hours:</u></p> <p>Fluid requirements 30-50 cc/kgbb = 30 ccx (patient's weight) kgbb</p> <p>IWL if there is no fever: 10cc/kgbb = 10 x (patient's BB)</p> <p>IWL if fever: 10cc/kgbb = 10 x (patient's weight) + 200 (temperature-37.5)</p>
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Levine's Conservation Theory Model Concept is a concept that has the principle of conservation with the aim that individuals can maintain their own integrity (Levine, 1996). There are three basic concepts in Levine's Conservation Model, namely adaptation, conservation, and integrity (Levine, 1988). Meanwhile, conceptually, conservation has four basic principles, namely Conservation of energy, Conservation of structural integrity, Conservation of personal integrity, Conservation of social integrity (Levine, 1988). Energy conservation is a nursing intervention that aims to maintain a balance between individual activities and the adolescent's current energy level. Conservation of structural integrity aims at the adolescent's physical recovery process. Conservation of personal integrity aims to focus on teenagers' feelings. Concern of social integrity is an interaction with the environment so that teenagers are more peaceful. Based on Levine's theory, it can be used as a basis for assessing patients with abnormal uterine bleeding. As in research conducted by Ozcan and Eryilmaz, (2021) uses Levine's conservative theory to create a model-based care for postpartum mothers. Apart from that, there is research that uses Levine's conservative theory which focuses only on energy conservation in children with leukemia (Khoirunnisa et al., 2020). Another study used Levine's conservation theory in patients with anemia and thrombocytopenia (Pamungkas et al., 2023).

Energy conservation can be done by conducting an assessment by looking at the level of fatigue, providing nutrition according to the patient's needs, looking at hemoglobin and albumin values (Khoirunnisa et al., 2020; Ozcan & Eryilmaz, 2021; Pamungkas et al., 2023). In the case of the teenager above, a hemoglobin examination was carried out to see the amount of hemoglobin lost in the patient. Hemoglobin is a protein that carries oxygen and nutrients that contain iron, so the hemoglobin value is related to the child's oxygenation and nutritional status (Pearce, 2009). Decreased hemoglobin values can cause fatigue and activity intolerance in patients so that fatigue assessment can be a reference for patients to carry out activities according to the energy they have (Ozcan & Eryilmaz, 2021). Nutritional assessments must also be carried out, such as checking BMI. The assessment of adolescents with PUA is adjusted to the concept of PUA assessment, namely that a BMI check, weight loss within a certain time, and a complete blood laboratory examination must be carried out (Cheong et al., 2017; Davis E & Spartzak PB, 2023).

Apart from that, the diet assessment was carried out using the Recall Diet method. Diet recall is carried out 24 hours through nurse interviews with patients. The 24-hour recall is usually carried out chronologically (morning to evening), where a list of foods eaten and drunk is recorded. Interviews can be conducted by recalling the previous day or the previous 24 hours. In PUA patients, this aims to monitor the cause of the patient's anemia or bleeding. Conservation of structural integrity for the patient aims to physical recovery of adolescents. Adolescents who suffer from PUA are at risk of hypovolemic shock if bleeding occurs continuously. Therefore, an assessment is needed regarding the causes of the patient's

problems. Nurses can assess menstrual history, namely age at menarche, last menstrual period, and characteristics of the menstrual cycle such as frequency, regularity, duration and volume of blood flow (Davis E & Sparzak PB, 2023). Menstrual frequency can be categorized as frequent (less than 24 days), normal (24 to 38 days), or rare (more than 38 days). Regularity can be described as absent, regular (with a variation of +/- 2 to 7 days), or irregular (a variation of more than 20 days). The duration can be classified as prolonged (more than 8 days), normal (approximately 4 to 8 days), or shortened (less than 4 days). Flow volume can be categorized as heavy (greater than 80 mL), normal (5 to 80 mL), or light (less than 5 mL blood loss). Apart from that, look for petechiae, bruises or bleeding gums, marriage history, history of malignancy, abdominal masses, medications used, family history, social history such as behavior that affects the quality of life of teenagers, vital signs, pallor signs, endocrine problems, and pelvic examination (Davis E & Sparzak PB, 2023). The patient was not given an examination such as a pelvic examination because the patient was not married and was still a teenager.

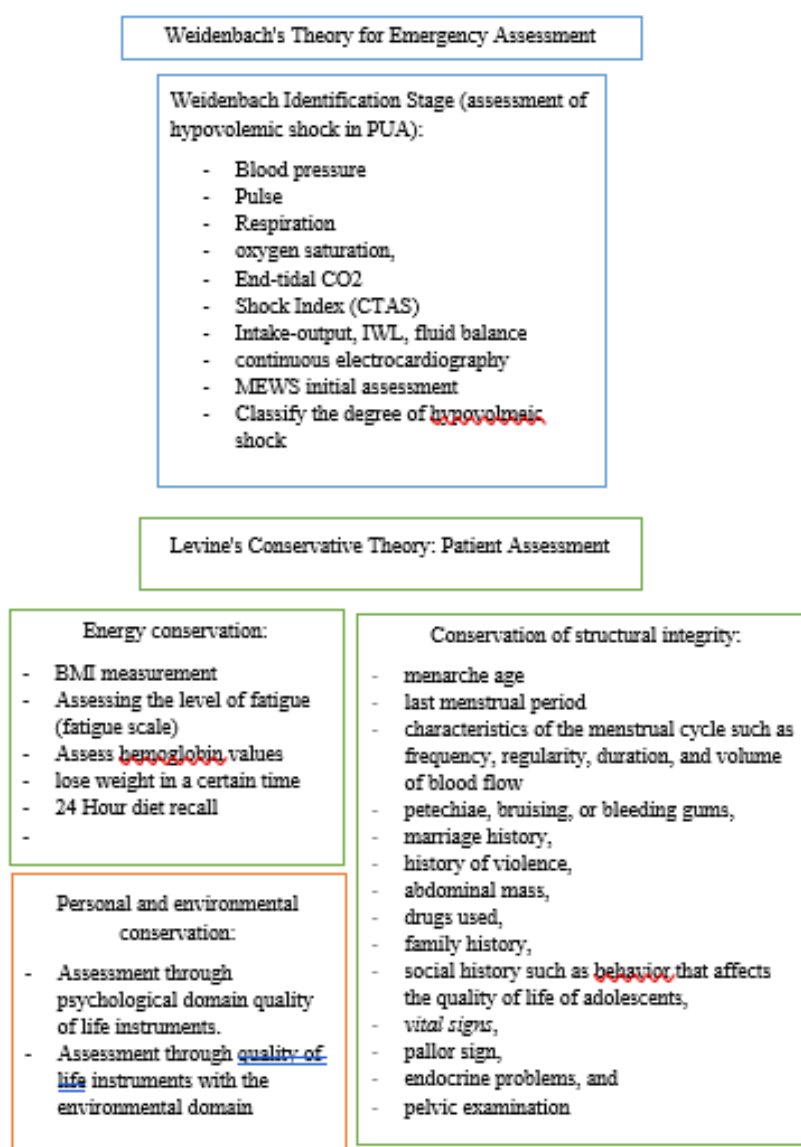


Figure 1. Levine's Conservative Theory

Conservation of personal integrity aims to focus on teenagers' feelings. In this aspect, studies can be carried out regarding psychological changes in adolescents or can be assessed using quality of life instruments with the psychological health domain (Ozcan & Eryilmaz, 2021). From the results of this study, you will see the extent of psychological changes and their influence on the patient's recovery process. At the stage of adolescent development, teenagers should be doing activities such as going to school and trying new things, but due to fatigue, activity intolerance due to lack of bleeding causes teenagers to lose time to socialize (Kızılcan Çetin et al., 2023). Conservation of social integrity is support from the environment and family. When sick, teenagers get support from the family, but nurses must see the extent of family support for teenagers. Nurses can also carry out assessments using quality of life with environmental domains (Ozcan & Eryilmaz, 2021). Support is an important aspect in the family and is one of the reasons the recovery process goes well.

CONCLUSION

In PUA patients, hypovolemic shock complications can occur, so effective and comprehensive assessment is needed to prevent increasingly serious complications. If the assessment is carried out correctly, the diagnosis, planning and management will be faster and more effective, resulting in a reduction in morbidity and mortality. When you are sick, you not only experience physical complaints but you also experience psychological problems. Assessments based on Weidenbach's and Levine's conservative theories can be the basis for conducting emergency assessments, physical and psychological aspects. Physical aspects can use conservative theories of energy and structural integrity. In the psychological aspect, you can use personal and environmental conservatives. For emergencies, this can be done based on the Weidenbach assessment.

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