Relationship Between Perceived Control and Daily Living Activities in a Coronary Care Unit

Master's Research Project

by

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CHAPTER ONE

The Research Problem

Multiple factors influence the way patients respond to a sudden, unplanned admission to a critical care unit. As clinical nursing manager of a coronary care unit (CCU), the researcher observed patients admitted with refractory ventricular tachycardia responded with powerlessness to their hospitalizations in the CCU. The loss of control these patients experienced was decreased by giving them control of as many daily living activities as possible. This raises concerns about how pervasive powerlessness is in critical care units.

The concept of control from a psychosocial perspective is discussed in the literature from a variety of viewpoints, most of which focus on the end results of multiple loss of control situations; very little discussion addresses responses to initial loss of control situations. The social psychologists do note that the importance one gives to a situation impacts the response one has to that situation. Some patients admitted to the CCU are experiencing their first confrontation with loss of control. Other patients in the CCU may be experiencing one of the most threatening loss of control situations life has to offer.

The nursing diagnosis used to address loss of control in clinical situations is powerlessness (Carpenito, 1984). However, the criteria for identifying this diagnosis are incomplete; the diagnosis is not fully defined; and predisposing factors, causes, and interventions have not been studied. One factor that has been identified as a contributor to patient powerlessness is the critical care environment (Roberts, 1986).

Critical care units have been noted to impact patient responses and outcomes (Anderson, 1982). However, since these responses have been studied in the early 1980's, the physical structure of most critical care units has been altered to afford the patient more privacy and communication with the outside world, particularly the knowledge of day and night provided by natural lighting. Anecdotally, nurses have noted a decrease in the negative outcomes documented earlier. It seems fitting to evaluate the effects these changes have had on patient responses to the critical care experience.

Studies addressing the impact of critical care units on biological rhythms have noted alterations in body temperature rhythms that may be related to the critical care environment itself (Felver, in review; Tweedie, Bell, Clegg, Campbell, Minors, & Waterhouse, 1989). The literature review in the next chapter of this study discusses the impact of sudden changes in environmental stimuli on various human responses. Unplanned admission to a CCU produces a sudden change in one's environment. The inference is that the impact of the critical care unit itself influences patient responses and, therefore, demands study.

The purpose of this study was to explore patient powerlessness in the critical care unit by focusing on loss of control of daily living activities as experienced by CCU patients. This problem is significant to nursing in view of the large number of critically ill patients cared for on a daily basis. The study of control is particularly relevant to nursing for three reasons. First, since nursing's overall purpose is to deal with human responses, studying the way patients react to critical care units is quite appropriate. Second, the assessment and treatment of powerlessness related to the critical care setting is almost entirely in the hands of nursing. The bedside nurse is in a position to diagnose powerlessness and intervene as needed, autonomously. Third, acting to control one's situation is "synonymous" with coping and differs from the way one views a situation (Lazarus & Folkman, 1984). The patient's ability to deal, or cope, with the situation at hand is a major focus of nursing practice. This study, therefore, addressed the issue of patient control in the CCU from the standpoint of daily living activities which are totally managed by nursing.

CHAPTER TWO

Literature Review and Conceptual Framework

This study is supported by a literature review that explores the concept of control from both theoretical and research perspectives, the perception of control in specific clinical settings, and the body temperature rhythm as it is impacted by disrupted sleep-wake patterns. In clarifying the concept of control, the contributions of social psychology, perceived control, reactance, and the clinical view of powerlessness are reviewed.

Research that focuses on the concept of control includes studies that examine learned helplessness, health locus of control, relationship of control to aging and chronic illness, perception of control during hospitalization, and the relationship of activities of daily living to control in the aged.

In the third section, perceived control in clinical settings is explored in relation to environmental issues and patients who have had myocardial infarction or refractory ventricular tachycardia, including the researcher's clinical experience with refractory ventricular tachycardia patients.

The final section focuses on one area of physiological disruption that the critical care environment impacts. It reviews the principles of biological rhythms, the normal body temperature rhythm of healthy adults, morningness-eveningness, the effects of irregular and phase-shifted sleep-wake patterns, and sleep-wake patterns in critically ill patients. The literature review summary highlights areas supportive of the conceptual framework for the current study.

Clarification of the Concept of Control

The concept of control will be clarified by examining the thoughts and research of the social psychologists who have viewed control from the perspectives of helplessness, causal attribution, perceived self-efficacy, and locus of control. Next, several supporters of perceived control are introduced along with the various typologies of control they propose. In addition, reactance is discussed as the precursor or counterpart of helplessness. Finally, writings that emphasize the clinical aspects of the concept of control will be described briefly. Table 1 has been provided as a summary of the dimensions of control introduced in this section and is referred to throughout this chapter.

Contribution of social psychology.

In analyzing the concept of control, the classic works of Seligman, Bandura, and Rotter will be reviewed briefly. The early work of Seligman was with animals in a laboratory setting (Seligman, 1968). These studies led to the belief that chronic fear and learned helplessness (LH) resulted from repeated exposure to unpredictable and aversive situations. It should be noted that the unpredictability of the situation, and not the aversiveness alone, is critical.

Table 1

Dimensions of Control

Dimension of Control	Primary Author	Definition
Learned Helplessness (LH)	Seligman, 1975	"..the expectation that an outcome is independent of responding.." (p. 55-56) results in motivational, cognitive, and emotional deficits.
Attribution (reformulated LH)	Abramson, Seligman, Teasdale, 1978	Once one perceives an inability to affect results of a situation (uncontrollability or noncontingency), one seeks a cause for helplessness. Cause can be internal/external, stable/unstable, and/or global/specific dimensions.
Perceived self-efficacy	Bandura, 1982	"Perceived self-efficacy is concerned with judgements of how well one can execute courses of action required to deal with prospective situations." (p. 122)
Rotter's Locus of Control	Arakelian, 1980	The generalized expectation that people attribute outcomes to internal causes if they believe "their actions or attributes" are responsible for outcomes and to external causes if they think results come from outside themselves and are unpredictable. (p.26)
Perceived Control	Lefcourt, 1973	Sensing that one has the ability 'to do something' about an aversive stimuli "serves to mitigate the debilitating effects of aversive stimuli". (p.419)
	Perlmuter & Monty, 1977	" the feeling of being free to exercise control". (p.759)
Reactance/ helplessness	Taylor, 1979	An individual who loses control of tasks they are used to doing responds with either helpless or reactant behaviors. Reactance is "..exhibiting anger against the arbitrary exercise of control" by outside forces. (p.157)
Alienation (powerlessness)	Seeman & Evans, 1962	"..one variant of alienation, namely the individual's sense of powerlessness--or,...'the expectancy or probability held by the individual that his own behavior cannot determine the occurrence of the outcomes, or reinforcements, he seeks.'" (p.773)

Seligman applied this notion to humans in his theory of reactive depression (Seligman, 1973, 1975). The theory says that, if one cannot control the outcomes of a situation, the results are decreased motivation, hindered learning about one's ability to control outcomes, and fear when the event is significant. Included in the theory are the notions that: (a) the situation in which the uncontrollable experiences occur is important; (b) the more traumatic an event is, the more generalized the resultant helplessness will be; and (c) the fear that accompanies uncontrollable occurrences in the early stages will be replaced by depression if the uncontrollability continues. In this stage of development, Seligman paralleled the symptoms and treatments of LH with reactive depression.

Criticisms to this theory arose as it was noted that not all people exposed to uncontrollable events became helpless. It seemed that the influencing factor was one's expectations and the search was on for an analysis of causation. Out of this arose the reformulated LH theory of attribution (Abramson, Seligman, & Teasdale, 1978; Abramson, Garber, & Seligman, 1980). Three dimensions of causation that affected one's response to uncontrollable situations were added to the LH theory. They were the causal dimensions of internal/external or personal/universal, stable/unstable, and specific/global. In the internal/external dimension, internal people blame themselves for situational results while external people blame outside forces; in the stability dimension, a stable cause occurs repeatedly while an unstable one occurs randomly and fluctuates; and, in the specific/global dimension, specific causes are limited while global ones are pervasive. The amount and depth of helplessness, along with its impact on self-esteem, was predictable based on the attributions chosen by the individual.

Studies based on attribution theory yielded mixed results. Some, fully or partially, supported the predictions of the theory (Alloy, Peterson, Abramson, & Seligman, 1984; Power, 1987). Others contradicted the theory's predictions (Follette & Jacobson, 1987; Hanusa & Schulz, 1977). These studies may have been limited by other variables that influence one's expectations of control, by the fact most of the studies were done in laboratories using students, and by unreliable tools (Stoner, 1985).

Bandura (1982) dealt with the concept of control from the perspective of self-efficacy which he described as one's perception of having the capabilities and skills needed to deal with the events and situations of one's life. Lazarus and Folkman (1984) closely relate Bandura's self-efficacy concept to coping and situational control. To Bandura, the effects of behavioral and cognitive control impact one's perceived self-efficacy when facing aversive stimuli which arouse fear, anxiety, and stress responses. Likewise, an intense sense of inefficacy contributes to the LH Seligman describes (1973, 1975). Bandura discussed the burdens and risks that can accompany control in situations that are demanding or require high levels of skills. In some challenging situations, people may choose to gain security by giving control to those who are more capable of handling the situation. Finally, Bandura referred to the need for restoring the perception of one's physical and social self-efficacy in relation to recovery from myocardial infarction.

Rotter's internal/external locus of control theory addressed the issue of cause as it relates to LH (Abramson, et al., 1980). Internal locus of control refers to one's perception that reinforcements are based on one's own action while those who have an external locus of control see the cause of reinforcements outside of self. Three research reviews will be used to examine the importance of locus of control as it pertains to the present study. Weiner, Niernenberg, & Goldstein (1976) concluded from surveying pertinent research that locus of control is only one factor, among many, which influences one's perception of cause and, therefore, the multiple causation view of attribution theory would be more supported by the literature. In addition, they conducted their own study using a real life situation and four questions that separated stability from locus of control. Their research supported the conclusions they made from their literature review. One criticism of their study is that the real life situation they chose was a classroom setting using college students; this limits generalization due to a variety of factors, including age, education, health, and importance of the situation.

Arakelian's review (1980) of the locus of control concept considered clinical applicability. She regarded Rotter's locus of control scale as one that is too general to make useful predictions; considered locus of control one of the variables that affects one's response to health care; and advised that patients' perceptions of the health care situation be included in assessments and plans of care.

Finally, Reid (1984) discussed internal/external control in the context of adjusting to chronic illness. Based on his work with the chronically ill, Reid concluded that a balance between internal and external control is important to avoid unresolved causation and resultant disruptions and anxieties. He advised the use of participatory control in chronic illness settings. This allows one to accept external control when needed because one maintains a role in his or her environment that decreases the threat externality brings.

In summary, the contribution of the social psychologists to the conceptual basis of the current study is that people respond to stimuli and situations based on past experiences, perceived abilities, and personality traits, such as one's locus of control bias. This brief review of the classics has focused on traits and situations that particularly influence one's expectations of control. Since the research based on these theories has not clearly supported personality traits as predictive of behavior in control situations, further exploration of the concept of control is warranted.

Perceived control.

This section focuses on the perception of control. Several typologies of control are reviewed as well as the notion that perceived control can cause negative reactions.

Lefcourt (1973) described the illusions of control and freedom as developments of humanity used for the purposes of understanding what is happening in one's world. He warned of the risks involved in having control but made it clear that control is essential to life and critical to one's handling of aversive stimuli.

Perlmuter and Monty (1977) discussed perceived control as a sense that one is able to deal effectively with the environment. Supported by their learning study and important to the understanding of perceived control is the notion that choice itself is not enough to improve performance but that it must be accompanied by the actual perception of control. They concluded that the availability of control may be responsible for many behaviors that have been accredited to other causes.

Palenzuela (1987) tried to clarify the meanings of locus of control and perceived control. He studied control from the contexts of personal achievement, interpersonal behavior, and sociopolitical activity and concluded that Rotter's locus of control has less to do with perceived control than Bandura's self-efficacy theory has to do with perceived control. In his opinion, internality and similar constructs are parts of locus of control and self-efficacy and locus of control constructs could be components of perceived control. His final conclusion was that further clarification of these constructs is necessary.

The inward behaviors that the LH and locus of control theories considered as giving up control were reviewed by Rothbaum, Weisz, and Snyder (1982) as behaviors that exhibit a secondary type of control. For them, primary control represents attempts to change the environment to meet one's needs while secondary control represents attempts to fit into the environment at hand. They maintain that people will try to get secondary control of a situation in which primary control has failed or is not feasible.

A classic typology of control is that of Averill (1973), who described behavioral, cognitive, and decisional control. He said that the experience of control is dependent upon the amount of agreement and identification one has with the choices given, not with the range of choices one has. He concluded that the meaning of a situation is critical to the stress associated with the perception of control and, for this reason, control studies need to be done in natural settings.

In Thompson's analysis of perceived control (1981), the emphasis was on knowing that one could affect a situation, not on the control one actually uses. Her typology included behavioral, cognitive, informational, and retrospective control. She eliminated decisional control, asserting that choice is inherent in any control study and in behavioral control. In her view, the meaning of a situation remains critical to one's response. Meaning is determined by the durability and desirability of a situation as well as whether the situation was planned or random.

A study by Fuller (1978) supported decision-making as an important part of control theories. The study showed that morale in the elderly was positively affected when they were given some choices during their movement into a home for the elderly.

S. M. Miller (1979) proposed a Minimax theory to describe reactions to control of aversive stimuli. The theory says that people will use instrumental control, or the ability to act in such a way as to affect aversive stimuli, thereby minimizing maximum future adversity. She was concerned that results of some control studies are confounded by the fact that control and predictability are not separated methodologically. She discussed physical, emotional, and behavioral stress as a negative response to difficult control situations one may encounter. Lefcourt (1973) also mentioned the stress response to control in discussing deaths and ulcers produced in animals who are perceiving a control situation as an overwhelmingly stressful event.

Burger (1989) further analyzed negative reactions to control and proposed a framework for evaluating these. He defined control, as others have, by emphasizing the importance of the perception that one has the ability to impact an event. His framework is based on the notion that the negative as well as the positive aspects of a control situation influence one's decision to maintain or give up control, one's emotional response, and one's task performance. These dependent variables are considered from the perspectives of self-presentation, positive outcome probability, and predictability.

In the first situation of self-presentation, one will keep control if one expects to succeed and give up control if one expects to be viewed negatively. Secondly, if the probability of poor results is great, one may choose to give up control so that outcomes will be more positive and anxiety levels will decrease. Burger regarded this as an extension of S. M. Miller's Minimax theory (1979) because control will be relinquished if that will minimize maximum danger in the long run. In the third instance, predictability, again confounded with control, may cause more anxiety by bringing attention to the aversive event. Burger concluded that negative and positive reactions to control may be predictable based on the impact of control in these and other situations and on how responsible one feels for the results of a situation.

Moch (1988) took a different stance on loss of control situations by referring to them as uncontrol situations. She defined control as a perception, as others have, but she viewed uncontrol as the acceptance of control being in the hands of a power outside of oneself (God's hands, for example). She claimed that health maintenance requires a balance of control and uncontrol and that nursing theories support this balance. She prescribed nursing interventions supportive of both control and uncontrol while emphasizing the importance of assessing whether the patient prefers control or uncontrol.

In conclusion, it appears that control exists in different forms for a variety of reasons. Whatever typology of control is used, two thoughts are consistently expressed. First, whether or not control action is taken, the perception of control is critical to one's successful interaction with the environment. Secondly, the meaning of the situation to the individual is key to understanding the response the individual may have to the situation. In addition, potentially negative effects from feeling responsible for controlling situations were noted.

Reactance and helplessness.

In contrast to the focus of many authors on the withdrawn and depressive responses to loss of control, other writers view outward behaviors evidence of a struggle to gain control. One example is the good and bad patient classification described by Taylor (1979). Her focus was hospitalized patients because of the control they must give up upon entering the institution. The good patient is compliant but passive and withdrawn as fits the description of LH theory. The bad patient, on the other hand, is reactant by continually trying to get attention and being non-compliant with hospital rules and health professional's expectations. It is Taylor's opinion that neither one of these behaviors is beneficial, physically and emotionally, and that they both represent attempts to gain control of the situation. She noted that reaction may occur first, followed by helplessness after reactance fails. She suggested it would be helpful to be able to predict which patients will respond in which way by looking at variables such as personality types and patient expectations. Another variable might be the amount of disruption hospitalization causes the patient.

Raps, Peterson, Jonas, and Seligman (1982) found no evidence of reactance in a group of patients in a Veteran's Administration hospital who did show decreased performance related to increasing length of stay and increased noise. However these patients had been hospitalized previously and for at least one week before the study. In addition, none of them had life-threatening problems. Another issue this study raises is that of socioeconomic status, especially for patients who are part of long-term systems which expect some degree of conformity.

As a result of interviews with cancer patients, Taylor (1983) proposed a cognitive theory of adaptation to aversive stimuli which includes searching for meaning, gaining mastery, and self-enhancement. Mastery is important because it can help one cope with the threat that has taken away one's control. She notes that coping will improve even if the feeling of control is an illusion, that people will control whatever they can when they are threatened, and they will give up on things they cannot control. Taylor suggests that research focus on finding these themes in other aversive situations in an effort to encourage adaptation.

Finally, Mikulincer (1988) examined reactance and helplessness in relation to unsolvable problems. In his study, Mikulincer viewed helplessness as Seligman did but saw reactance as an earlier response to threats as described by Taylor (See Table 1). Even though the study was done in an artificial setting using student subjects, Mikulincer concluded that one isolated failure can stimulate improved performance, indicating reactance to the situation. On the other hand, repeated failures result in helplessness. He also concluded that internal-external attributional style affects the amount of emotional response with the internals having more intense responses.

Of interest to the current study is Mikulincer's factor analysis of the negative feelings assessed on his mood scale which consisted of twelve 4-point bipolar responses evaluating how the subjects felt during the experimental task. The negative feelings loaded on two factors. The first factor addressed helplessness, incompetence, and depression and accounted for 43% of the variance. The second factor focused on anger and frustration and accounted for 25% of the variance. This lends support to the need for including reactance in discussing the issue of control.

Together these papers highlight the importance of a situation's meaning to the perception of control and response it elicits. In addition, one's situational responses are influenced by the nature of the environment, socioeconomics, attributional style, past experiences, and one's sense of mastery of the situation. Finally, other variables, such as disrupted biological rhythms, may affect response to an aversive situation.

Clinical perspectives.

This section explores the clinical use of the concept of control from the identification of the hospital as a threatening environment in the early sixties to the present inclusion of powerlessness as a nursing diagnosis.

In a classic study, Seeman and Evans (1962) explored the relationship between learning and the alienation, or powerlessness, produced by the hospital setting. Patients' knowledge about their tuberculosis was measured on a 20-item true-false test while alienation was measured on a scale similar to Rotter's Internal-External scale. The high alienation, or powerless, patients learned less and the low alienation patients sought more information and were more satisfied with it. The researchers concluded from this study that interest and knowledge about a situation is affected by alienation or powerlessness. Although the researchers carefully matched their sample, they reported little about the environment studied and did not evaluate how the patients felt about their alienation.

Early in nursing literature appeared D. E. Johnson's (1967) description of powerlessness. Based on Seeman's alienation theme and Rotter's social learning theory, she noted that powerlessness, as general personality trait, is relatively stable and related to learning; as such, it is important for nursing to consider. She admitted that the concept of powerlessness had not been sufficiently explored and it would be helpful to know what aspects of hospitalization influence powerlessness and when this general expectancy impacts specific situations. According to her, two problems restricted further concept development. The first was lack of an easily used and reliable tool for assessing powerlessness clinically. The second was lack of situational baselines that would allow the nurse to evaluate when powerlessness is significantly influencing behavior. These problems remain today.

In the early eighties, three writers explored the control concept. Schnieder (1980) defined related terms based on her critical care viewpoint. She described powerlessness as the realization that one cannot affect specific outcomes that occur after several failures. She described learned helplessness as the realization one is in a situation in which one's responses have no impact. Schneider concluded that helpless feelings can be prevented by allowing and encouraging patients to control whatever they can. Chusid (1981) said the paradox of control is that helpless people maintain control of a situation by giving control to someone else. Finally, Kritek (1981), a nurse, explored power in the health care system by maintaining a diary of her experiences as a patient. She found a variety of specific issues related to patient control of time and environment. Kritek advised further research in this area for the development of knowledge base and interventions.

Although powerlessness was not listed as a nursing diagnosis until later (Carpenito, 1984), Roy (1984) included it as a concept for nurses to include in patient assessment and treatment. She defined powerlessness as: "the perception on the part of the individual of a lack of personal or internal control over events within a given situation" (p. 369). It is important to note the emphasis placed on the perception of the individual and on the impact of the specific situation at hand. Although she listed a few outward behaviors as indicative of control attempts, her focus, and that of the characteristics of the nursing diagnosis (Carpenito, 1984), are on the withdrawn and depressive behaviors of the LH theory.

Powerlessness has been included in discussions of both chronic and acute care. J. F. Miller (1983) describes powerlessness as "situationally determined" (p. 38) in contrast to locus of control which she considers an inherent personality trait that influences one's response to a situation. She considered powerlessness a patient problem wholly within the realm of nursing to manage. As such, the behavioral assessment tool (p. 127) she proposed could be beneficial to the development of interventions but it fails to examine the patient's perspective.

Roberts (1986) considered the relationship between powerlessness and critical care environments. She attributed powerlessness to physiological, psychological, and environmental loss of control as well as to lack of knowledge. She described the nurse as an "environmental stimulus" that can "positively influence the patient's sense of control" (p. 184). Roberts described regulatory and cognitive behaviors patients display in response to powerlessness as well as nursing interventions that could be used to foster powerfulness. She included outward, reactant behaviors along with helpless behaviors. To her, locus of control simply influences present patient feelings and nursing approaches. She proposed several interventions for the purpose of restoring patient control. These included participation in, and making decisions regarding, one's health care.

In summary, the perception of loss of control, or powerlessness, appears to be present, at least theoretically, in the hospital setting and is considered to be highly influenced by nursing. Unfortunately, few studies have gone further in this analysis; those that have will be presented in the next section of this chapter.

Summary.

In summary, the concept of control has been explored from the generalized approach of the classic social psychologists to the more specific approaches of others. These writings emphasize the importance of the individual's perception of control and the meaning the individual gives to the situation. Behavioral responses to uncontrollable situations can vary from outward, reactant behaviors to inward, helpless behaviors. Clinically, loss of control is discussed in terms of powerlessness. The various definitions of control have been summarized on Table 1 for reference as research studies that analyze the concept of control are reviewed.

Research on the Concept of Control in Clinical Settings

In this section, research studies that focus on control in clinical settings are critiqued and their contributions to this study are highlighted. The critique begins with research that has addressed LH clinically and locus of control from a health perspective. This discussion is followed by a sampling of studies of control in the elderly and chronic populations. Next come two examinations of perceived control from clinical perspectives. Finally, research that focuses on the relationship between activities of daily living and control is analyzed for merit and contribution to the present study. Despite the fact that none of these studies specifically examines control in a critical care setting, they all provide supporting data to the need for this type of study.

Learned helplessness.

Two research groups have recently searched for a tool to assess LH clinically. Both groups define LH as Seligman does (See Table 1). The first group (Slimmer, Lopez, LeSage, & Ellor, 1987) began by exploring the understanding of LH from the perspective of a small group of geriatric nurses (N=44). The first of two tools used to collect data was a semantic differential scale that asked the nurses to rate how desirable they thought LH was, what behaviors they expected to see with LH, and how important they feel LH is. The second tool was used by the nurses to record signs and symptoms that reflected LH. They were to include on this tool why they thought LH existed in that particular instance and what nursing intervention might be appropriate to the situation.

The most important result of this study was that nurses regarded the purpose of LH behaviors to be an attempt to control others rather than a result of perceived loss of control. The researchers felt this indicated a lack of nursing knowledge of the LH concept and a need for further research to clarify the manifestations of LH. They failed to suggest that their view of the concept of LH may need expansion or alteration.

The generalization of this study is limited, due to the small sample of nurses. In addition, the fact that only nurses caring for the aged and/or disabled participated in the study may have slanted the description of LH behaviors to the withdrawn, apathetic types seen after multiple loss of control situations. Further discussion about this study is limited by the lack of sample description in this and the subsequent study. One final criticism of this study is that its focus on the end results of LH limits interventions to LH situations and eliminates prevention and treatment of earlier helpless and reactant behaviors.

These researchers (LeSage, Slimmer, Lopez, & Ellor, 1989) continued to study the concept of LH with a pilot study that attempted to define LH operationally as it exists in the chronic elderly. Fourteen of the LH patients identified by nurses in their first study described above (Slimmer et al., 1987) were compared to 21 patients randomly chosen from the same two long-term care units. The researchers were specifically looking for how the LH patients were feeling, whether the randomly chosen group felt any different subjectively, and measurement tools that would be helpful in identifying LH patients.

The tools used were: (1) Attributional Style Questionnaire (ASQ), consisting of three positive and three negative situations to which the respondents are asked to relate causes; (2) Beck Depression Inventory (BDI); (3) learned helplessness (LH) and sad mood (SM) scales of the Multiscore Depression Inventory (MDI), used to measure the amount of LH; and (4) a semi-structured interview, that focused on how much personal decision-making patients were presently doing and how satisfied they were with that amount of perceived decisional control.

As noted by the researchers, the results of this study are limited by the small sample and by the high refusal rate which was increased in females and in the LH identified patients from the first study. It is of concern that the length of time from identification of LH patients to implementation of the rest of the study is not clear; this would be a critical piece of data since LH is considered to progress as loss of control situations increase (Seligman, 1973, 1975).

Comparison of the medians of the two groups did not show a significant difference in the BDI, SM, LH, or the interview. The ASQ had two scores that showed significant differences: (1) the LH group more often attributed negative events to themselves ($p<.05$) and (2) the randomly chosen group more often attributed positive events to stable/global causes ($p<.03$). The interview found three subjects with LH characteristics, two previously identified and one from the random group; however, among these subjects, no consistency was found in relationship to the instrument scores. The interviews indicated that both groups desired more decisional control over their privacy and their mealtimes; both groups were satisfied with professionals making involved decisions for them including those pertinent to their health care.

The researchers believed that the results support the reformulated LH model and that their modifications of the ASQ, which used more believable situations, revealed promise for this tool in identifying LH patients. They did not view the LH subscale as a sensitive measure and criticized their interview for not obtaining more subjective information about the subjects' desires for more or less control. In addition, they noted that more recently admitted patients commented more about control issues; however, in their evaluation and recommendations, they only alluded to the potential importance of this early phase by remarking that interventions could focus on prevention as well as treatment of LH.

Quinless and Nelson (1988) also worked on the development of a clinical tool to measure LH based on attributional styles. The researchers listed 50 items from the literature and submitted them to the authors of the attributional LH theory (See Table 1) for prioritizing. The final LH Scale consisted of 20 items, 10 positively worded and 10 negatively worded, which respondents were asked to rate on a Likert scale. In addition, hopelessness and self-esteem were measured on previously established scales.

The tool was tested with three groups of subjects: (1) 229 healthy subjects, ages 15-25, with equal gender representation (no mean age was available because age was collected in intervals), (2) 241 healthy adults, ages 18-80 (mean age 39.8) and 72% female; and (3) small samples of oncology (mean age 59.9), hemodialysis (mean age 61.0), and spinal cord injured (mean age 47.7) patients with only one female included (no age ranges were noted).

Since the first group reported confusion due to the mixture of positive and negative questions, the negative questions were reworded for the second group. After rewording, the questions loaded evenly on the dimensions of attribution theory with the exception of four questions which were retained because they were theoretically related to LH by focusing on ability to control and choice. Based on alpha coefficients of 0.82 or greater, the authors believed the internal consistency of the tool was acceptable. They also stated that the correlations between this scale and the hopelessness and self-esteem scales represent concurrent, criterion-related validity.

In view of the discussion of reactance and prevention of LH presented in the first section of this chapter, the applicability of this tool would be limited to those populations that have reached the advanced stages of LH. In light of the criticisms of attribution theory, it is of concern that the only experts consulted for construct validity were those who authored the attribution theory.

In summary, the two clinical tools reviewed in this section have limited usefulness in that they restrict their focus to the final stages of LH and support only the constructs of the attributional theorists. Further work is needed to expand the general usefulness of a tool for evaluating LH in clinical situations. The next section will review the applicability of a tool that is based on locus of control.

Health locus of control.

In an attempt to increase the predictability of the locus of control (LOC) construct as described by Arakelian (1980; See Table 1), B. S. Wallston, K. A. Wallston, Kaplan, and Maides (1976) developed a scale for measuring LOC from the specific perspective of health. The scale consists of 11 items rated on a six-point Likert scale. Further analysis of the Health Locus of Control (HLOC) scale (Rock, Meyerowitz, Maisto, and K. A. Wallston, 1987) found that respondents loaded on six clusters extended from the three causal subscales of internal, chance, and powerful others. The analysis was based on two studies of the scale done by this group. The first study identified the clusters and the second one validated the clusters. Both studies used healthy student populations and neither found gender differences. The conclusion made by the researchers was that the HLOC scale was more complex than expected and that this may yield varied results in different patient populations.

Lewis (1982) used the HLOC scale with late-stage cancer patients to examine the relationship of quality of life to personal control over life and the relationship of quality of life to personal control over health. Quality of life was measured using three tools: self-esteem, anxiety, and purpose-in-life. The sample consisted of 21 males and 35 females with a mean age of 54. The study showed that personal control over life correlated more significantly with quality of life than did personal control over health. Specifically, high personal control over life was significantly related to higher self-esteem, lower anxiety, and more purpose-in-life (p=.001). On the other hand, HLOC was significantly related only to purpose-in-life (p=.05). In addition, length of disease was significantly related to HLOC and anxiety but it was not significantly related to self-esteem or purpose-in-life.

This section describes an attempt to develop an LOC measure more specific to health situations. Unfortunately, predictability of this tool may be limited in some populations. In order to proceed further with use of this tool, studies would need to determine if characteristics of the sample influence the varied predictability.

Aged and chronic illness studies.

In this section, a sample of studies that have examined the relationship of control to aging and chronic illness is reviewed. Among the concepts studied, choice and LOC are considered as well as the role of control and predictability in adaptation.

Langer and Rodin (1976) evaluated the effects of choice on the institutionalized aged and concluded from their experiment that some of the negative effects of aging may be diminished if decision-making is maintained. The research was done by giving the experimental group a plant to care for and to place where they chose and by a formal communication from the nursing home administrator that encouraged patient independence.

They measured the effects of the interventions by a behavioral evaluation and two questionnaires administered one week before and three weeks after the interventions began. One questionnaire asked patients to rate their daily control, happiness, and activity while the other one asked nurses to evaluate the patients' activity levels and affect. Behavior was evaluated by attendance at a movie, participation in a contest, and the amount of movement of their wheelchairs. At the three week evaluation, alertness and activity levels increased in the experimental group while they were constant in the control group. As the researchers noted, the impact of this small change lends support to the critical need people have to maintain control in their daily situation.

In an attempt to improve predictability of Rotter's LOC theory (See Table 1), Reid, Haas, and Hawkings (1977) developed a tool that was situationally specific, that was to be used with a narrow sample of elderly individuals, and that added desirability to the assessment of control. In addition to evaluating whether subjects saw control of their situation within or outside themselves, the tool asked how much control over various aspects of their situation the subjects desired. Scores on the locus of desired control measure were calculated by summing the cross-products of the desirability and perceived ability scales. The researchers expected that the institutionalized elderly who had a higher locus of desired control would have a better self-concept.

In the first part of the study, the subjects were 60 institutionalized elderly, equally divided by gender with a mean age of 83. In the second part, the 143 subjects included 78 institutionalized elderly, 52 females and 26 males, and 65 independently living elderly, 46 females and 19 males. The only age information given for this part of the study was that all participants were over 65.

The variables measured were: (1) self-concept based on ten 5-point semantic differential items; (2) internal-external locus of desired control based on the sum of the cross-product of two sets of questions, one focusing on desirability and the other on perceived ability to exert control; (3) happiness and assertiveness rated by the nurses; and (4) contentment and happiness rated by the subjects of the second phase. The scales were administered by interview with respondents reading responses from large print scales.

The results of the first phase showed, for males, a significant correlation between their scores on the locus of desired control scale and positive scores on the self-concept scale ($\underline{r}=.68$; $\underline{p}<.001$). On the other hand, females only showed a correlation of .05 between these two scales. In the second phase, the correlations were similar but not as strongly positive for the independently living males indicating that institutionalization increased the male's need for desired control and/or the scale was slanted to give more positive results in the institutionalized males. Institutionalized females, in the second phase, reported higher levels of contentment than the males.

Since the study found the relationship of LOC to self-concept was increased by adding desire for control, desirability may increase the predictability of LOC measures. The authors concluded that desire for control is an important concept to consider when evaluating the well-being and adaptation of the elderly, especially males.

In an attempt to relate patient behavior to locus of desired control, Mullins (1982) used the Reid et al. (1977) scale described above. Patient behavior was classified as good or poor based on a consensus from the nurses and aides caring for the patients. In addition, Mullins assessed how patients perceived their own health, the patients' functional levels, and how much social support the patients received. Of the 228 subjects obtained from three nursing homes, 59.5% were female, mean age was 75.18 years, and mean length of stay was 21.86 months.

Of value are the results that increasing age, more education, decreasing function, and poorer health were all associated with scores on the locus of desired control scale that were greater than the mean score. This supports the need for including patient profiles and characteristics in studies focusing on control. Of little value is the result that there were significantly more "poor" behavior patients who desired more control.

Several factors limit the value of this result: (1) the definitions of good and poor behavior patients were skimpy and subjective, (2) the use of non-professionals as patient evaluators is questionable, (3) the researchers ignored the notion of reactance and prevention of LH by implying that outward behaviors are bad. If one considers outward behaviors as a struggle for control of one's own experience, the poor behavior patients in this study may not have reached the withdrawn, apathetic end results of LH and interventions at this point may be critical in preventing LH. It is interesting to note that this struggle may have been seen in a group of patients with an average length of stay of 21.86 months.

In another aged study (Hickson, Housley, & Boyle, 1988), LOC, age, and gender were examined in relation to life satisfaction and death anxiety. The three measures used were Rotter's LOC scale, the Philadelphia Geriatric Morale Scale, and a Death Anxiety Scale. The sample of 122 ranged in age from 61-80 and included 84 females and 37 males. It was obtained from those associated with a senior citizen organization or a retirement center. Gender analysis was important to results of this study in that females had a lower life satisfaction and higher death anxiety while males declared a greater relationship between life satisfaction and internal LOC. Since the results of this study show an inconsistent influence from LOC, the researchers suggested further research is needed to clarify whether LOC is a trait variable or a changing parameter influenced by time, events, and environment. Research is needed that explores the relationship of LOC to age and developmental stages, situational and environmental variables, and life experiences.

The relationship of perceived control to adaptation was examined more specifically in a study by Affleck, Tennen, Pfeiffer, and Fifield (1987). These researchers asked 92 rheumatoid arthritis patients if they, or their health care providers, had control over their symptoms, disease, and treatments. The study is based on the notion that individuals seek to control what they can control and give to others the things they cannot control (Rothbaum et al., 1982). Perceptions of control were measured on a visual analog scale with scores of 1-10. They were obtained in 90-minute interviews that also included measurements of symptoms, mood, health status, and uncertainty of illness.

Results indicated: (1) increased perception of personal control over symptoms and disease was associated with increased predictability of the disease; (2) positive mood was associated with greater perceptions of personal control over treatment and negative mood was associated with greater perceptions of health care providers' control over symptoms; (3) the more severe the symptoms, the more significant was their association with mood; and (4) the only sociodemographics that influenced mood were family income and illness duration. In contrast to other studies, age and gender were not related to control or predictability.

The researchers concluded that these results support Reid's (1984) thoughts about participatory control and acceptance of what one can and cannot control in adapting to chronic illness. In addition, the researchers noted that provider variables as well as patient variables should be considered in adaptation studies. Unfortunately, the length of the mood questionnaire would preclude its use with acute cardiac patients.

In summary, the studies that focus on aging and chronic illness pose a variety of variables that need to be considered in clinical research that examines the concept of control; these variables are pertinent to any of the dimensions of control described in Table 1. Among the pertinent subject variables are age, gender, health status, and importance the subject gives to the specific control issue. In addition, many of these studies emphasized that the particular situation being experienced impacts how one perceives control and how one responds to that perception. Finally, participation in controlling whatever one is able to control affects mood, morale, and adaptation.

Perception of control during hospitalization.

Two studies contribute to the description of the perception of control during hospitalization.

The Personal Opinion Survey (POS) designed and tested by Coan, Fairchild, and Dobyns (1973) identifies seven dimensions of experienced control. The researchers' definition of experienced control can be placed in the category of perceived control in Table 1. They contrasted their tool's seven dimensions of experienced control to the limited external facets of Rotter's LOC scale. The seven dimensions extend from three broad content areas which include: (1) external events, such as the people and environment immediately around the individual; (2) personal characteristics, such as traits, habits, moods, and lifestyles; and (3) bodily aspects, such as heart rate, respirations, strength, appearance. All three of these content areas are applicable to some extent to hospitalized patients in general and cardiac patients specifically. Unfortunately, the questionnaire has 120 items which may be too lengthy for acutely ill patients to deal with. The merit of the POS to this study is its identification of control as a multidimensional experiential phenomenon as opposed to a restrictive and relatively permanent personality trait.

Dennis (1987) studied perceived control in 70 medical-surgical patients who were in a large military hospital, 24-75 years old, and admitted for diagnosis of cancer. A 45-item Q-sort was used to identify what activities gave hospitalized patients a sense of control. The three dimensions of control factored from the Q-sort supported

Averill's (1973) behavioral, cognitive, and decisional types of perceived control. The three dimensions centered on the patient role, decision-making, and management of interpersonal and environmental factors. Although some patients concerned with patient role desired control of activities of daily living, more focus was on decision-making pertinent to their disease and treatment. This may have been related to the diagnostic focus of these hospitalizations.

As noted by the researcher, this study needs to be repeated with larger populations that vary in site of hospitalization and diagnosis. In addition, age ranges and severity of illness should be considered intervening variables as should the influence of the health care provider as noted in the Affleck et al. (1987) study reviewed earlier. Dennis' Q-sort methodology may be too demanding to use with critically ill patients but this research contributes to the current study by supporting the fact that perceived control of various aspects of hospitalization is important to patients. Research needs to explore those aspects more specifically and in a variety of situations.

The two studies discussed in this section highlight the fact that the perception of control is not simply based on personality traits but on multiple dimensions of control that influence one's response to a control situation. The critical care milieu is one of the many hospital-related control situations that merits further analysis from a patient perspective.

Activities of daily living.

In order to examine the experience of hospitalization from the patient's perspective, it is necessary to focus on specific situations patients encounter. One situation all patients deal with is the maintenance of the activities of daily living (ADL). The following studies examine the relationship of control to maintenance of ADL in the aged.

Chang (1978) developed and piloted a tool to measure situational control of daily activities (SCDA) as perceived by the institutionalized elderly. She suggested that knowing who controls care is a measure of quality of care which could guide practice. In addition, she considered patient perception and situation specific items important to the analysis of control. The SCDA consisted of 22 items focusing on who determined the time, place, and needed assistance for each of the eight activities included. The activities and categories were obtained from field study done by Chang. The tool was administered by interview and responses were coded on the SCDA as "self" or "other determined".

Two groups of patients tested consisted of 79 subjects who were over 60 years old, cognitively intact, and had been in the same unit for two weeks to six months. In the first group, there were 30 whites; in the second group, 30 whites and 19 blacks. It is questionable why the author limited the notation of a racial difference to her sample description. In light of other studies that find males more concerned with control (Coan et al., 1973; Hickson et al., 1988; Reid et al., 1977), it is disconcerting that Chang did not report gender.

Factor analysis showed the SCDA loading on two dimensions with Control of Socializing and Privacy accounting for 71.2% of the variance and Control of Physical Care for 28.8% of the variance. Mean morale scores for persons scoring high on "self" determination were higher regardless of whether they scored internal or external on the LOC scale with $\underline{p}<0.0001$. The high correlation between SCDA and morale found in these elderly patients supports examining the impact control of ADL has on other patient populations and clinical situations.

Ryden (1984) measured perceived control in the institutionalized elderly using Chang's SCDA and the Philadelphia Morale Scale with the addition of an evaluation of health status and functional dependency. The sample included 59 residents from intermediate care units and 54 from skilled units obtained from four facilities.

Results showed the SCDA contributed to morale in intermediate care patients with an $\underline{r}=.34$ and $\underline{p}=.01$; while, in skilled care patients, SCDA contributed to morale with an $\underline{r}=.59$ and $\underline{p}=.001$. Personal care and eating were the items patients felt they controlled the least. Length of stay had no effect on morale in the intermediate units and a nonsignificant effect on the skilled units. Socioeconomic status had no effect on morale in the skilled units but it had a moderately positive effect on morale in the intermediate units with a significance of .05.

Ryden concluded that perceived situational control significantly contributes to morale in the institutionalized elderly and that one's sense of control is lessened by increased functional dependency. Although the results are not generalizable to critically ill patients, they do raise the issue that increased severity of illness may enhance the importance of controlling one's immediate situation, including ADL.

Colling (1985) studied the influence of selected environmental and individual characteristics and perceived control of ADL on well-being. For the study, she developed the Control of Daily Activities Questionnaire (CDAQ) which asked subjects to evaluate their participation in ADL as well as the importance of their decisional control of the ADL. A congruence score was calculated which allowed inclusion of the dimension of "low control over highly important ADL" in the analysis. Mood and morale were considered the indicators of well-being and were measured on two different scales. The sample included 118 institutionalized females with a mean age of 85.

Results pertinent to the current study were: (1) functional status was only weakly correlated to control of ADL indicating that a supportive nursing approach can maintain well-being; (2) those who considered staff support to be high had an increased sense of perceived control of ADL; and (3) well-being was highly correlated with perceived control of ADL (*r*=.41, *p*=.001) but less correlated with low control over highly important ADL (*r*=-.30, *p*=.001). The author suggested that social desirability and gender influenced results of the importance subscale of the CDAQ. In view of other studies that showed males more concerned with control (Coan et al., 1973; Hickson et al., 1988; Reid et al., 1977), it is highly probable that gender influenced the importance scores. As women who have lived more independently in their earlier years reach old age, these gender differences may be attenuated.

In summary, the three studies above demonstrate a significant relationship between control of ADL and morale and well-being in the institutionalized elderly. This causes one to ask whether the advanced age of the subjects, the institutional setting, or the combination is the most influential factor in this relationship.

Summary.

Although none of these clinical research studies specifically address control in the CCU, they all contribute to the conceptual framework of the current study. The LH studies pointed out the need for tool development as well as clarification of the concept of LH and, thus, its predecessor, loss of control. The Health LOC scale failed to predict behavior emphasizing that something more than a personality trait determines one's response to a control situation. The aging and chronic illness studies focused on more specific situations and their meaning to the patient with increase in morale noted when patients were able to participate in controlling even a small part of their situation. They also supported the need to add sociodemographic analysis to studies on control.

The studies that focused on the perception of control in hospital situations indicated that control is a multifaceted phenomenon that pervades much of the hospital experience. As such, control needs further clinical analysis. Unfortunately, the tools used in those studies are too lengthy or challenging for critically ill patients to handle.

The ADL studies demonstrated a clear relationship between mood and morale and control of ADL in the institutionalized elderly. Since mixed results were found when relating functional status to control of ADL, it would be helpful to clarify this relationship as it affects critically ill patients. Together, the studies point to the need to include gender in analyzing studies on control.

Perceived Control in Clinical Settings

Although no complete studies that directly address control as it relates to daily living activities in the CCU have been found, there are writings and studies that address the issue indirectly. This section begins with studies that deal with environmental influences and continues with writings that deal specifically with myocardial infarction (MI) and ventricular tachycardia (VT) patients.

Influences of environment on perceived control.

As noted in a recent study (Simpson, Armstrong, & Mitchell, 1989), it is important for nurses to examine the effects critical care units have on patients because this will clarify the human responses to this situation. In this study, 59 patients were asked, shortly after transfer, about their CCU or ICU experience. The four open-ended questions used focused on reasons for admission, information sources, who did what for them, and the overall impact of the experience. More ICU patients than CCU patients knew why they were admitted but more ICU patients were also unable to participate in the study and many CCU patients had diagnoses that were unconfirmed. Despite the reported perception that nursing actions were positive or neutral, 56% of the patients reported the overall experience as negative with 36% of this due to pain and 22% due to sleeplessness.

The researchers concluded that the impact of these negative stresses indicates the patient's perceived loss of control, although they did not measure control. The value of this study could have been improved by obtaining specific information about patients' feelings regarding loss of control and more descriptive data about the patients who experience critical care units negatively. This study does highlight the importance of studying the responses of patients to critical care units.

Anderson (1982) described the responses of 60 patients to interviews that focused on their experiences in one of four different types of critical care units. The sample was 55% male with an age range of 35-88. All patients reported stress as a result of needing help with personal care and lack of privacy; the writer related this to the "Helplessness and embarrassment reported by many of the patients." (p. 199). Patients who were admitted for MI or angina responded differently than other patients to the interview questions. Memory of the stay in CCU experience was clearer and began within 24 hours of admission compared to the limited memory reported by patients in the other critical care units. More specific data about the responses to these interviews are not included in this report; however, the overview of the study presented lends support to the focus of the current study on the responses of patients to the CCU environment.

Since control has been related to aversive stimuli, it is appropriate to discuss two articles that examine some annoying aspects of the critical care environment. Topf (1984) posed a framework for looking at aversive stimuli using hospital noise as the annoyance. She expressed the idea from the literature that increasing perceived control increases predictability which, in turn, decreases anxiety. In addition, Topf encouraged the use of a control group and multivariate analysis when studying this topic because of the personal variables that influence one's response to aversive stimuli in the environment. Among the individual variables to be considered are personality traits, such as locus of control, age, socieconomics, and severity of illness. Others that could be added to this list would be past experiences with aversive stimuli, including previous admissions to a critical care unit, the state in which one enters the aversive environment, and how aversive one considers the stimuli. Although Topf did not report a study using this framework, her recommendations regarding individual variables have been considered in developing the conceptual framework and demographic assessment for the present study.

The framework of a study by Hilton (1985) also involved the negative effects of hospital noise. The sample in this study was obtained from three hospitals and consisted of 25 patients from six different nursing units, four of which were intensive care units. Noise levels were measured and patients were asked how the noise affected them. The smaller hospitals were quieter than the larger hospitals when similar units were compared. For the most part, the noise levels were what patients expected; there were strong negative feelings about noise in the postoperative cardiac surgery unit which had 10 beds in two large rooms. Most negative comments centered on the lack of sleep and lack of knowledge of day and night. This supports the need to examine further the effects of critical care units on sleep-wake and day-night cycles. Since most critical care units are now being structured with windows and private rooms, studies that were done several years ago need to be repeated under present conditions.

One abstract is available that supports some of the framework of the present study. Kallio and Sime (1980) thought that patients in the CCU who were induced to control their daily living activities would report more perceived control, less negative feelings, and better quality nursing care. The sample included 20 control and 20 experimental clients. The control group heard an orientation tape 48 hours after admission and care went on as usual. The experimental group heard a tape inducing them to control their daily living activities and staff were instructed to encourage patient control of the timing of daily living activities. Although the experimental group did not report any significant difference in quality of care, they did report greater perceptions of control and had less fatigue, anxiety, depression, and anger than the control group. The abstract did not describe how patients controlled their activities nor did it explain the three questionnaires used in the study. There is also no review of other patient characteristics that may have influenced results of the study.

Together the studies in this section support the notion that critical care environments impact patient response and outcomes. In addition, CCU patients have responses to their situation that are either unique to the CCU or to their cardiac diagnosis. Whatever the cause, their environmental responses warrant study.

Control and the myocardial infarction patient.

Perceived control is presented as a factor influencing adaptation after myocardial infarction (MI) in the following three studies. Sulman and Verhaeghe (1985) sought to develop a framework that could be used by the health care professionals in their institution in identifying patients who were at risk, medically and psychosocially, after MI. Predictability and perceived control were included in the psychosocial factors important to survival and recovery. They combined the concepts of adaptation and compliance to form four groups of patients whose risk factors impacted recovery. One of the risk factors included the amount of dependence or independence the patient displayed and whether it was appropriate or excessive. Their description of this range is similar to the reactance versus helplessness notion discussed above.

Patients in Group IV were thought to be non-compliant and at increased risk of recurrence of MI or complications related to maladaptive denial and excessive independence. Interventions advised for patients in Group IV focused around their need to defend themselves against a loss of control over their future and their need to master this situation realistically. Although the authors have not formally studied the applicability of this framework, the developers did report anecdotal success in using this framework to identify high risk patients and to structure interventions most appropriate to their needs.

Affleck, Tennen, and Croog (1987) studied the outcome of illness one year after MI and its relationship to the perception of control and attribution of cause. Approximately 300 patients were interviewed at seven weeks and again at one year after MI. They were asked to rate the importance of five categories of causes for their MI's. Their answers were related to socioeconomics in that younger patients attributed their MI to personal behavior at seven weeks but to luck at one year and, at both times, patients of higher socioeconomic status said heredity was the cause. In addition, those of lower socioeconomic status were significantly sicker at one year. Perceived control was evaluated at seven weeks with 59.6% of the patients thinking they could have done something to avoid their MI. At one year prospective control was evaluated and 71% felt they could prevent further MI. There was a significant relationship noted between retrospective and prospective control.

The researchers concluded that it was important for control to be restored after MI because personal behavior and stress, both of which are potentially within one's control, were most frequently attributed by patients as the causes of their MI. They also found demographics so pertinent that they advise including them in further research on control. Finally, the researchers indicated that their measurements of attribution and perceived control could have been improved, thereby examining intervening variables that may be important.

J. L. Johnson and Morse (1990) used grounded theory and content analysis to explore the adjustment process one goes through after MI. The fight to regain control was identified as the major issue in the process based on the 26 interviews that were conducted. The authors described four stages with several phases each; these evolved from the content analysis and were described thoroughly. Although each stage included control issues, the analysis lacked specificity upon which interventions to improve perceptions of control could be based. Learning more about the effects of perceived control after an MI would contribute to the development of strategies that can hasten the adjustment to life after an MI.

Together these studies support the importance of research on control issues following MI. The current study examines one control issue specifically, by analyzing the relationship between disrupted daily living activities in the CCU and perceived control.

Control and patients with refractory ventricular tachycardia.

Over the last ten years or more, a population of patients who have ventricular arrhythmias refractory to conventional therapy has arisen. Many require the use of potent and/or investigational drugs and/or electrical interventions. Because of the unique and life-threatening aspects of these arrhythmias, the psychosocial problems these patients develop deserve particular attention. The pervading uncertainty of their arrythmias produces a feeling of loss of control in patient, family, and health care professionals.

These patients first came to my attention several years ago when I was in charge of a CCU where patients with refractory ventricular tachycardia (RVT) were admitted for diagnosis and treatment. As the number of RVT patients increased, the staff and I noticed a variety of behaviors that were different from those of our other patients. Some patients withdrew into private worlds; others denied the seriousness of their illnesses despite having experienced sudden cardiac death (SCD); and still others became compulsive about their environment. Several discussions about these patients ensued along with innovative approaches to their care. Several months and several patients later we decided that the patients were feeling that they had no control over anything that was happening to them. This perceived loss of control included environmental and social factors and was stimulated by the uncontrollable aspects of their disease. In addition, we realized our discomfort with the limitations of treatments available to them and with the loss of control we felt as well.

At that point we decided to focus on factors we could control. From experience, we learned that patients with RVT often tolerate VT for long periods of time. This reduced our stress because we could see that, most of the time, we could cardiovert them in an organized fashion. Patient-related interventions centered around giving them control of whatever we possibly could. This included deciding what they would eat, when they would bathe, and when they would visit. The results were almost immediate. Once these patients began making simple decisions successfully, they were able to progress to deciding how they would handle their RVT at home.

The success of this experience changed my practice. I am now concerned with how pervasive this issue of loss of control is among patients with heart disease. It would be beneficial to know if the perceived loss of control experienced by RVT patients is related to, among other things, RVT specifically, the environment in which RVT patients are placed, the disruption of daily living activities caused by the CCU, or personality factors which patients bring with them to situations. Due to the impact the researcher noted when RVT patients were given control of daily living activities, the current study focuses on the effects of disrupted daily living activities on perceived control. In addition, diagnosis is not limited to RVT patients so that the influence of the CCU can be examined in general.

Perceived loss of control in RVT patients has been conceptually and anecdotally reviewed in the literature.

McCauley, Choromanski, and Liu (1984) described RVT patient problems and related nursing actions based on Johnson's seven interacting subsystems. They described the achievement subsystem as focusing on controlling and mastering the environment, the protective subsystem as one greatly affected by the loss of control patients and families feel, and the dependency subsystem as varying, based on the amount of control people consider important. The authors listed disrupted sleep-wake cycles as limiting the restorative subsystem. Finally, they emphasized the role that nursing can play in stabilizing the status of the patient and the family.

DeBasio and Rodenhausen (1984) approached the psychological needs of RVT patients from the viewpoint that powerlessness and loss of control were related to major issues RVT patients face and were a source of anxiety, depression, anger, and guilt for them. One example they used is that patients who fail electrophysiology studies feel they are unable to control their own bodies. To deal with RVT patients, they developed a nursing assessment group to support each other, to monitor patient stability, and to assess when patients were ready to join the patient support group which met weekly for the purposes of education and feeling exploration. Anecdotally, results were improved staff communication, continuity of care, and morale as well as continued patient participation in the support group. The researchers advised analysis of this kind of group and

RVT patient issues in addition to measuring patient stress before and after group participation and nursing job satisfaction.

More recently, automatic internal cardioverter defibrillators (AICD) have been implanted in patients who have experienced SCD from ventricular fibrillation. Informal discussions with AICD patients hint at a renewed sense of control that comes from their confidence the AICD will save them from SCD. In exploring psychological reactions to AICD, Fricchione, Olson, and Vlay (1989) described four adjustment syndromes. They defined nine of their 17 patients as reacting "normally" to the AICD but they did not describe what a normal reaction to having an AICD ought to be. They related their problematic adjustment syndromes to maladaptive denial but refrained from giving a reason for these reactions. Although the authors mentioned that AICD patients who learn to relax gain control over their anxiety which helps recovery, they did not include perceived control in the description of their syndromes.

This researcher's experience and the three reports reviewed in this section support the notion that perceived control is a pervasive issue for patients with RVT. For this reason nursing research that focuses on control issues is needed.

Summary.

The section above reviewed the following findings regarding perceived control in specific clinical settings:

(a) The critical care environment has a generally negative impact on patients with regard to aversive stimuli; (b) CCU patients tend to remember their experience in critical care more clearly than other critically ill patients; (c) One abstract reported less fatigue and stress when CCU patients were given control over their daily living activities; and (d) Anecdotal reports indicated that perceived control is an important issue for patients with RVT.

Body Temperature Rhythms and Disrupted Sleep-Wake Patterns

The critical care environment has been described above as disruptive, aversive, and conducive to a perceived loss of control. Among the factors that may contribute to the loss of control patients in critical care units feel are those factors that disrupt normal sleep-wake cycles and body temperature rhythms. This section begins with a brief description of some of the characteristics of biological rhythms, the body temperature rhythms of healthy adults, and the concept of morningness-eveningness. Following this, studies that focus on irregular sleep-wake cycles, the effects of transmeridian flights on sleep patterns, and sleep patterns in critically ill patients are discussed.

Biological rhythms.

Many physiologic processes have rhythmic fluctuations referred to as biological rhythms. These endogenous rhythms exist independently within the body. They become free-running, that is, continue their inherent cycle, when environmental stimuli are removed. Endogenous rhythms can be entrained, or synchronized to the environment, so they coincide with the 24-hour clock produced by the cycles of day and night. Environmental stimuli that can alter the patterns of one's biological rhythms are called zeitgebers, or synchronizers. Man's most influential zeitgeber is the sleep-wake cycle (Minors & Waterhouse, 1981, 1986). Other synchronizers, such as light (Czeisler, 1989), eating, and social activities, follow the sleep-wake cycle and may also affect rhythm patterns (Minors & Waterhouse, 1981, 1986). Masking of a rhythm occurs when environmental stimuli, particularly those that vary from one's normal routine, influence or obscure the shape of a rhythm (Wever, 1985).

Much sleep-wake research focuses on the phase-shifting that people experience when the timing of their sleep-wake cycle is suddenly changed. In phase-shifting, the rhythm maintains its shape but its clock time is altered. The rhythm is phase-advanced when each part of the rhythm has an earlier clock time. It is phase-delayed when each part occurs later than usual in clock time (Minors & Waterhouse, 1981, p.4). Phase-shifting happens when the timing of significant zeitgebers, such as the sleep-wake cycle, is changed. Travel westward produces a phase-delay in that everything is occurring later than usual; travel eastward causes a phase-advance during which events, including sunset, are occurring earlier. In general, adaptation to the new time is faster when the zeitgeber is delayed than when it is advanced (Minors & Waterhouse, 1981, p.20).

Body temperature rhythms of healthy adults.

Body temperature is known as one of the most stable (Minors & Waterhouse, 1981) and powerful biological rhythms despite the fact it fluctuates less than two degrees Fahrenheit in a 24-hour period (Halberg, 1977). In a healthy adult who lives in a standard environment, the body temperature rhythm has a gradual, but progressive, rise shortly before customary waking time to a peak late in the activity period, 11-15 hours after one's usual midsleep time; it has a gradual decline beginning at the peak and progressing to a nadir shortly before midsleep of the customary rest period (Campbell, Gillin, Kripe, Erikson, & Clopton, 1989; Vitiello, Smallwood, Avery, Pascualy, Martin, & Prinz, 1986).

The influences of age and gender on the temperature rhythms of healthy adults in standard environments have been examined. Vitiello et al. (1986) found similar shaped curves when comparing aged men (mean age 68.5) to younger men (mean age 24.1). The aged men were found to have lower mean temperatures at the beginning of the rest period and significantly higher nadirs during the rest period than younger men. This resulted in lower peak to trough amplitudes in the aged men. During the study, subjects had the same meal and sleep-wake times, based on clock hours, but the researchers did not discuss how closely this schedule resembled the subjects' normal schedules. In addition, there may have been seasonal effects on the results because the young men were studied in May, June, and September while the aged were studied in September and October.

Campbell et al. (1989) compared the temperature rhythms of 10 elderly males (mean age 69.42) to those of 12 elderly females (mean age 69.19). The females had temperature rhythms with significantly earlier peaks (1.25 hours before the males), earlier evening declines with more rapid descents, and earlier nadirs (50.3 minutes before the males) followed by earlier morning inclines. In addition, the females had earlier rise times producing shorter total sleep times and less overall satisfaction with their sleep. No differentiation of morningness-eveningness was reported and a small sample size was used.

In summary, the temperature rhythms of healthy adults in normal environments have an increase that begins just prior to waking and peaks 11-15 hours after midsleep as well as a decline that begins at the peak and dips to a nadir shortly after midsleep. Age and gender alter some characteristics of the normal temperature curve but the general shape of the curve remains the same.

Since environmental influences can entrain and or mask endogenous rhythms, it is appropriate to examine the unusual environment produced by the activities of a critical care unit. Tweedie, Bell, Clegg, Campbell, Minors, and Waterhouse (1989) analyzed the temperature rhythms of 15 patients in an intensive care unit (ICU). Of the 189 patient days analyzed, 152 (80%) of the 24-hour periods had temperature data that significantly fit a cosine curve. Peak times varied considerably from day to day and from patient to patient. The temperature rhythms in unconscious patients had significantly greater amplitudes than those in conscious patients. The researchers concluded that the exogenous influences of the ICU environment and the therapies being used could have masked the endogenous temperature rhythm. As noted by the researchers, further study of this nature should include severity of illness, degree of sepsis, more frequent temperature measures, and more data about the care activities required by these patients. Since the study was done retrospectively, it is impossible to know what specific influences may have impacted the results.

Felver (in review) studied the body temperature rhythms of eight male ICU patients (mean age 58) within five days of admission. The study included assessment of environmental influences that can affect body temperature. Measurements consisted of oral temperatures every hour, air temperatures every four hours, inspired ventilator temperatures every 15 minutes, and temperature-influencing environmental events as they occurred. Seven of the subjects had temperature rhythms that were significant, one with a 24-hour rhythm, five with 12-hour rhythms, one with a 6-hour rhythm, and one with both 24 and 6-hour rhythms. The eighth patient had a trend toward a rhythm. The 6-hour rhythms were the only ones affected by the environmental influences, specifically acetaminophen administration and sleep.

Both of these studies demonstrate that ICU patients frequently have altered temperature rhythms. The alterations in their temperature rhythms may be due to the patients' unstable physiology and/or the ICU environment. Further examination of patients in critical care units may reveal alterations of other rhythms and their zeitgebers as well as altered affective responses.

Morningness-eveningness.

The concept of morningness-eveningness (ME) has been explored by Horne and Ostberg (1976) in their development of a questionnaire that can be used to determine one's circadian type, or preference for morning or evening. The questionnaire delineated ME by asking preferences for activity, bed, and arising times as well as what times of day one feels best and most productive. High scores on the questionnaire indicated morning preference and low scores indicated evening preference. Circadian types were externally validated by significantly correlating different temperature curves with each personality type. In comparison to evening types, morning types had significantly earlier peak times with tendencies towards higher daytime temperatures and lower temperatures post peak.

The researchers used the English translation of an originally Swedish questionnaire on 150 students, aged 18-32, equally divided by gender; 48 of the subjects monitored their temperatures as well. The study showed significant differences in bedtime, arising time, and peak temperature time but no difference in sleep length. Morning types had generally higher temperatures through the day until 1800, more rapid morning temperature rises, earlier late activity temperature peaks, and earlier rising and bed times when compared to evening types. Those subjects whose scores were middle-range were considered intermediate types; their temperature curves and sleep-wake preference times were in between those of both the morning and evening types. Unfortunately, no analysis of internal consistency was done. In addition, the study sample was college students in England. College students vary from the general population in social habits, intellectual abilities, and sleep habits. It also may be difficult to generalize the study due to cultural bias. As the authors noted, the study should be repeated with other populations. A subsequent study showed the internal consistency of the Horne and Ostberg questionnaire was moderate with an alpha coefficient of 0.82 (Smith, Reilly, & Midkiff, 1989).

The three biological rhythm studies reviewed in the following section have included ME as a variable. They were chosen because of their importance to the current study. They have identified ME by the Horne and Ostberg questionnaire (1976). The studies need to be evaluated with caution due to small sample sizes and varied scoring methods used to identify types.

Ishihara, Miyasita, Inugami, Fukuda, and Miyata (1987) determined ME types by the Horne and Ostberg questionnaire (1976) using the original scoring criteria. The first part of the study was a survey of 1459 college students (mean age 19.5) in which ME was identified and related to life habits. For the experimental part of this study, 10 morning and 11 evening types identified from the survey were examined for differences in their sleep-wake habits and EEG sleep variables. Morning types slept from 2300 to 0700 and evening types slept from 0100 to 0900. Sleep-wake habits of ME types were similar to those found by Horne and Ostberg (1976). The only EEG difference noted was shorter REM latencies in the morning types. There was no objective difference in sleep quality; as expected of morning types, they reported feeling better on arising. The researchers concluded that morning types are either more strongly synchronized by environmental and social zeitgebers or they have a stronger endogenous sleep-wake rhythm.

Lavie and Segal (1989) examined differences in sleep patterns of morning and evening types by exposing them to schedules consisting of 7 minute sleeps alternating with 13 minute activity periods for 24 hours, first after a normal night's sleep and secondly, after a night of sleep deprivation. Six morning and five evening types were chosen from 114 male students. Those who scored below the 10th percentile on the Horne-Ostberg questionnaire (1976) were considered morning types and those who scored above the 90th percentile, evening types. This is different from Horne and Ostberg's scoring system which used raw scores of 59 and above to indicate morningness and scores of 41 or less to indicate eveningness. There were wide differences, independent of type, noted in individuals with regard to amount of sleep. Some differences were noted by type, such as, morning students slept more during the night while evening students slept more from 1100-1400. There were no additional differences found when sleep deprivation was added. The researchers commented on the wide individual differences but believed that the study supported the fact that morning types have more rigid sleep schedules and that evening types have less difficulty sleeping during the day and are, thus, better candidates for shift work and other abnormal rest-activity routines.

Floyd (1984) examined the relationship between the sleep-wake cycles of circadian types and the rest-activity schedule of an inpatient psychiatric facility. The sample included 35 inpatients who were matched with 35 outpatients on the basis of diagnosis and age. The researcher found no definite evening types, 11% moderate evening, 53% neither, 33% moderate morning, and 3% definite mornings types. For analysis, she combined both morning types. Results should be interpreted in light of the fact there were no definite evening types and only two definite morning types.

The results showed that hospitalized patients slept significantly less than outpatients; they did not differ on the time they fell asleep but they did awaken about one hour earlier than the outpatient group. Consistent with other studies (Horne & Ostberg, 1976; Ishihara et al., 1987), total sleep time for inpatients did not vary by circadian type. In contrast, the outpatient circadian types differed significantly in the times they fell asleep and in awakening times. All hospitalized patients were phase-shifted indicating the hospital routine was not consistent with the schedules of any circadian type. Hospitalized morning types were phase-delayed three-fourths of an hour in the morning and one hour in the evening; evening types were advanced three hours in the morning and one and a half hours in the evening; intermediate types were awakened one and a half hours earlier.

This study demonstrated that the hospital routine has a strong influence the timing of the sleep-wake cycle. The researcher advised an examination of how circadian types feel when they are phase-shifted by hospitalization but she was not specific about how this ought to be done. Finally, since depression has been linked to disrupted sleep-wake cycles (Surridge-David, MacLean, Coulter, & Knowles, 1987), it is of concern that depression was not used as a covariate as ten of the 35 matched patients carried this diagnosis.

The overall implications of these studies for nursing are that the hospital environment has a significant influence on sleep-wake cycles and that ME types vary in sleep habits, in EEG sleep analysis, and, more importantly, in adaptability to alterations in rest-activity schedules. In addition, the feelings of patients who have experienced phase-shifting from hospitalization have not been previously explored.

Irregular sleep-wake cycles.

Since the hospital environment has been noted to disrupt sleep-wake cycles, it is important to the current study to review research that has looked at the effects of irregular or interrupted sleep-wake cycles on biological rhythms and mood. The first is a study by Leddy (1977) that required the experimental group of nursing students to go to bed and arise one hour earlier than usual. Although no change was found in blood pressure or temperature from the one hour shift, subjects noted that it was difficult to fall asleep one hour earlier and it was even more uncomfortable to get up earlier than usual.

Mills, Minors, and Waterhouse (1978) examined the effects of varied sleep schedules on nine subjects in an isolation unit. Of importance to the current study is the free-running rhythms that occurred in the subject that was subjected to constantly changing sleep times. Some patients going through extreme and/or continuous physiological crises may have little or no structure to their rest-activity schedule. The authors (Mills et al., 1978) pointed out that rhythms noted during times of unusual routines may not represent entrainment and, thus, may be subject to further alterations or reversion to former cycles. This raises questions about how people feel after discharge and may be related to the post-discharge malaise and fatigue many patients have reported.

Minors, Nicholson, Spencer, Stone, and Waterhouse (1986) analyzed temperature, urinary constituents, performance, and mood in 30 healthy, young volunteers who were exposed to irregular rest-activity schedules in an isolation unit. They found rhythms in excess of 24 hours in temperature, most urinary constituents, and two of the mood assessments, namely alert-dulled and efficient-useless. In addition, they found performance and mood were not related to temperature but to wakefulness in that both deteriorated after nine hours of activity and performance improved after a rest period. Pertinent to the current study is the implication that naps may help people cope with the irregular rest periods found in some critical care situations.

Miyasita, Fukuda, and Inugami (1989) exposed 44 young male students to forced awakenings during a normal night's sleep. They were awakened for 10-90 minutes 20 minutes into their second sleep cycle as documented by polysomnography. The most significant finding was a decrease in REM latency after being awakened. Based on their temperature measurements and the research of others, these researchers hypothesize that this decrease in REM latency is due to the timing of the endogenous rhythm of body temperature. It would be beneficial to know if the timing and/or the length of the sleep interruption has bearing on the results. An analysis of sleep stages in relation to rest-activity schedules is beyond the scope of this study; however, the above noted change in sleep stages related to forced awakenings has bearing on the interrupted sleep of patients in critical care units.

In summary, irregular sleep-wake cycles have been shown to be uncomfortable and to affect mood, biological rhythms, and sleep stages. Since patients in critical care units are often awakened for a variety of reason, they may experience altered sleep stages and biological rhythms as well as discomfort and affective disruptions.

Alterations of sleep-wake cycles during transmeridian flights.

Since unexpected admission to a critical care unit and sudden compliance to a new schedule can resemble phase-shifting, studies that focus on travel across time zones will be reviewed in this section. As noted above, travel westward produces a phase-delay in that everything is occurring later than usual; travel eastward causes a phase-advance during which events, including sunset, are occurring earlier.

Sasaki, Kurosaki, Mori, and Endo (1986), examined the effects of changing time zones on sleep patterns of morning and evening types. Based on a modified Horne and Ostberg (1976) questionnaire, the six highest scores were considered morning types and the six lowest were considered evening types. The subjects were 12 male airline crewmembers flying from their home base in Tokyo to San Francisco, returning to Tokyo after a 48 hour layover. Subjects chose their sleep and arise times as well as eating and bathing times. Sleep latency was recorded throughout the sleeping period and every two hours during the active period. Sleep quality and fatigue were measured subjectively. Quality of sleep decreased during various sleep periods in the layover but objective measures did not always parallel these evaluations. Sleep stages will not be discussed here except to say that sleep latency was increased if sleep was less stable. The morning types had more daytime sleepiness with an abrupt decrease in latency noted around 1200 changing the baseline concave pattern of sleep latencies to an L-shaped pattern. The evening types' normal concave pattern changed to a W-shaped one.

There are two cautions to consider in evaluating this study. First, the ME types were defined by median which is not what Horne and Ostberg (1976) did. Secondly, the subjects were only studied for 48 hours after each change which would prevent them from seeing the delayed adaptations noted in the Nicholson, Pascoe, Spencer, Stone, Roehrs, and Roth study (1986). On the other hand, the W-shaped pattern noted in the evening types has similarities to the zig-zag recovery found in parts of the Monk, Moline, and Graeber study (1988) which is discussed later in this section. The increased sleepiness noted during the layover day for the morning types suggests that ME types may vary in their adaptation; evening types may be more adaptable.

Nicholson et al. (1986) recorded sleep and daytime alertness based on sleep latency to stage 1 by electroencephalogram (EEG). The subjects were six healthy males travelling between London and Detroit (a 5-hour time zone shift). This shift would resemble a hospitalized patient, who normally goes to bed in the early evening, not being allowed to retire until late evening. Since westward travel causes a phase-delay, they were sleeping later than usual, causing wakefulness during the latter part of the new rest period which corresponded to the activity period prior to travel. Normal daytime latencies were resumed by the third or fourth day. Eastward travel would resemble hospitalized patients who normally go to bed in the late evening being forced to retire in the early evening. Eastward travellers slept well on the first night after travel due to 19 hours of wakefulness. However, it took them longer to adapt to the time zone shift, as noted by decreased total sleep time and sleep efficiency on the fifth day after travel. This implies that the assessment of sleep quality needs to continue throughout hospitalization and that phase-advances, which are simulated by moving sleep time ahead of the usual, are more difficult to adapt to than are phase-delays.

Monk et al. (1988) simulated a transmeridian flight in the laboratory. On the sixth night of a 15 day stay in an isolation unit, the sleep period of 8 middle-aged males was shortened by six hours simulating the phase-advance of eastward travel. This would resemble the hospitalized patient who was forced to go to bed significantly earlier than accustomed. Mood, performance, sleep, and temperature were measured. The researchers expected a monotonic adaptation to the change, that is, they expected disruptions to adjust in a linear fashion with the most disturbance the first day after travel and lessening amounts noted each day after that. This occurred only with temperature. Performance improved as a result of practice. Mood, specifically alertness, sleepiness, and motivation returned to baseline in a zig-zag fashion. The EEG sleep data will not be reviewed here. This study reinforces the affective results of disrupted sleep and the concerns nurses have with this as noted above.

In summary, hospitalizations that cause sleep-wake cycles to mimic the changes that occur when one travels across time zones may also cause the adverse effects that accompany these changes. The adverse effects may include altered sleep patterns and mood swings with adaptation being prolonged in morning types and in those patients who are phase-advanced.

Sleep-wake patterns in critically ill patients.

Many other factors influence sleep-wake cycles, subjectively and objectively. Moore-Ede, Czeisler, and Richardson (1983) described the hospital environment, particularly the critical care units, as an environment likely to cause disruption of normal circadian rhythms because of the inherent nature of the milieu. In addition, they (Moore-Ede et al., 1983) and others (Winget, DeRoshia, Markley, & Holley, 1984) challenged us to find ways of making intensive care units more like normal environments in relation to the zeitgebers to which most people are accustomed.

Among the environmental factors that have been studied in relation to disrupted sleep-wake cycles are the effects of light (Dijk, Visscher, Bloem, Beersma, & Daan, 1987; Wever, 1985), noise (B. Fruhstorfer, Pritsch, & H. Fruhstorfer, 1988), and room temperature (Parmeggiani, 1987). Any of these three factors could be problems in the intensive care unit. In the following section, three studies that examine sleep-wake patterns in critically ill patients will be reviewed.

Hilton (1976), described the sleep patterns of ten patients in a respiratory intensive care unit. Sleep was recorded polygraphically while observers noted sleep related behaviors and sleep disturbing factors. One week after transfer from the unit, patient interviews included questions that addressed their usual sleep patterns, sleep disturbing factors in the unit, and their impressions of "unexplained experiences" (p. 456), which the researchers do not discuss further.

The results were that patients had less total sleep time than usual and that the stages were not normal when compared to results of other studies. While patients reported they usually had 100% of their sleep at night, they only had 50-60% of their sleep at night in the intensive care unit. Poor quality sleep was documented by the lack of complete sleep cycles. Environmental sounds and noises made by staff were observed and reported as disturbing to sleep. Although generalization is limited due to the small sample and restriction to a respiratory intensive care unit, the results clearly indicated disrupted sleep patterns in the group tested. This supports the notion that sleep in a critical care unit may be disturbed and unlike one's usual sleep routine.

Richards and Bairnsfather (1988) described one to three nights' sleep of ten male patients in a medical intensive care unit (MICU) by polysomnography. They compared this sleep to that of matched subjects monitored in a sleep lab and reported in another study. The MICU subjects all had cardiac diagnoses, were between 50 and 69 years of age, and were divided into day and night sleepers based on their reported home sleep patterns. They were placed on the unit schedule for bedtime which was 9p.m. to 6:30a.m.

The results revealed no polysomnographic differences in the three nights' sleep of an individual but did show significant differences among subjects and in comparison to controls. Those who normally slept during the day (47% of the sample) had shorter, less efficient sleep than the home night sleepers; this implies that disrupted sleep schedules correlate with poor quality sleep.

The researchers proposed several factors that may have influenced the results, among which are location in the unit, acuity level, medications, daytime naps, and a change in scoring the sleep recording which decreased the epoch length from one minute in the lab to 20 seconds in this study. As the researchers noted, it would be beneficial to know how patient outcomes and responses are affected by disrupted sleep routines. Patient reactions pertinent to the current study are affective responses, patient satisfaction, and perceptions of control.

Fontaine (1989) investigated the connection between observed and reported sleep to polysomnography. The sample included 20 trauma patients with a mean age of 26.1 who reported they usually slept during the night hours. When compared to healthy, age-matched subjects, the sleep disturbances noted in these patients involved increases in wake time and stage 1 with decrease in stages 2, 4, and REM along with a mean of 32 awakenings per night. Nursing observations were reliable with regard to sleep latency ($p<0.05$), midsleep awakening ($p<0.05$), and wake after sleep onset ($p<0.01$). Patient perceptions of awakenings lasting longer than four minutes were considered reliable ($p<0.05$) when compared to polysomnography.

Although not all observed and reported sleep traits and stages were convergent, the researchers concluded that nursing observations and patient perceptions are valid assessments of sleep. The study is general in its description of circadian type; it would have been helpful to know if morning and evening types perceive their sleep differently. In order to evaluate patient responses to sleep disturbances in the ICU, the validity of nursing observations and patient perceptions is pertinent. In addition, it would be helpful to know how patients feel about the disturbed sleep they get in the ICU and if disturbed sleep contributes to, or is caused by, patient perceptions of lack of control.

Together these studies describe critical care units as environments that are not conducive to normal sleep patterns and schedules. Unfortunately, none of the studies assessed how disturbed sleep affected patients, physiologically or psychosocially.

Summary.

In summary, literature has been reviewed that supports the thought that disruption of sleep-wake patterns has significant effects. The body temperature rhythm is entrained by sleep-wake patterns and is affected by circadian type. Irregular sleep-wake cycles can cause rhythms to free-run; they can deteriorate performance and affect mood; and they can disrupt sleep stages. Sudden shifts in timing of sleep-wake cycles, such as those experienced in transmeridian flight, cause phase-shifting and result in altered EEG sleep patterns. Finally, sleep patterns were noted to be disrupted in three studies that examined patients in intensive care units. Together, these studies indicate the disruptive effect that comes from alterations in the usual sleep-wake cycle which is experienced to varying degrees by most patients in critical care units.

Summary of Literature Review

The literature review has reviewed research and writings that analyze and discuss the concept of control, research on the concept of control, perceived control in clinical settings, and body temperature rhythms and disrupted sleep-wake patterns,.

The dimensions of the concept of control are summarized in Table 1. The social psychologists look at personality traits and states that affect an individual's feelings of control or helplessness. Perceived control focuses on successful interaction with the environment and the importance given to the meaning of a situation in relation to an individual's sense of control. Various typologies of control were reviewed with behavioral, cognitive, and decisional control being the most frequently cited and the most clinically appropriate. Reactance was described as outward behavior noted in response to loss of control in contrast to the inward behaviors noted with LH. Finally, powerlessness is the clinical term used to describe a perceived loss of control.

Research on the concepts of LH and LOC has had limited predictive value and clinical applicability. The specific situations of aging and chronic illness showed increased morale when patients were given some control of their environment. Studies that examined perceived control in clinical settings found control a multifaceted, pervasive phenomenon; unfortunately, the tools used for these studies were too lengthy for critically ill patients to use. Research that focused on daily living activities in the aged showed increased morale associated with control of daily living activities.

Specific critical care writings emphasize: (a) aversive stimuli in critical care units can affect patient responses negatively, (b) CCU patients respond to the CCU environment differently from patients in other critical care units, (c) control issues are important to MI patients, and (d) perceived control is a pervasive issue in patients with RVT.

The literature review supports the notion that disrupting sleep-wake cycles, from either irregular sleep-wake schedules or phase-shifting, has significant effects on body temperature rhythms, performance, and mood. Body temperature rhythms were shown to be altered in some ICU patients. Sleep patterns were noted to be disrupted in critically ill patients to varying degrees.

The literature review supports the conceptual framework for this study and its operationalization. It also emphasizes the need for this study in a variety of ways. First, the concept of perceived control, from a clinical perspective, is not fully developed or researched. Secondly, the affective responses of patients to critical care environments have not been studied since significant structural changes have been made to prevent the emotional problems noted in earlier studies. Thirdly, perceived control is vital to the responses of cardiac patients. Finally, the critical care environment is disruptive to sleep and other activities that revolve around the sleep-wake cycle.

Conceptual Framework

The conceptual framework for this study evolved from the researcher's clinical experience and a review of the literature. It is represented in Figure 1 and is based on the premise that, in a given situation, an individual's perception of control is determined by the interaction of the individual with the environment. The concept of control is defined in a variety of ways, as noted on Table 1. For the purposes of this study, control is defined as the perception that one has the ability to influence the outcomes of a given situation. (See Table 1, perceived control). Perceived control is the sense that one is able to impact an event. This is in contrast to powerlessness, which is a generalized sense of one's inability to impact outcomes.

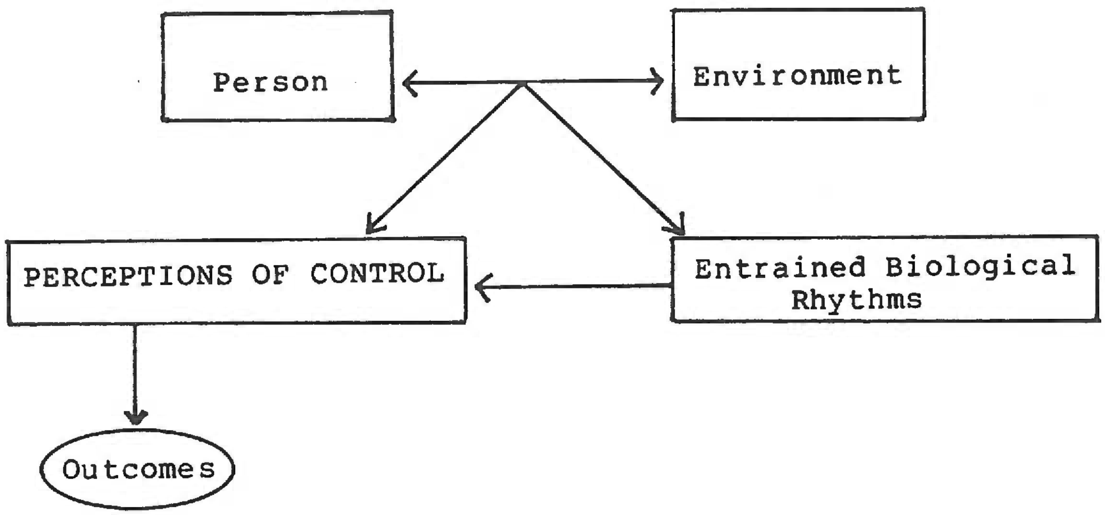

Figure 1. Conceptual framework for the study of the relationship of perceived control and daily living activities in a CCU.

When an individual is presented with stimuli or situations, particularly aversive ones, perception of the ability to deal with the issues at hand impacts how the situation is viewed. Individuals who perceive that they have the amount of control they desire in a given situation feel more positive about the situation and react more effectively with their environment. Individuals who perceive that they have more or less control than they desire in a given situation feel more negative about the situation and may react to those feelings in a variety of ways.

The conceptual framework for this study is operationalized for a patient in a CCU and is represented in Figure 2. The individual characteristics included in the framework are morningness-eveningness (ME) and stable body temperature rhythms entrained to the pre-CCU environment. One of the environmental influences that may affect one's response to a given situation is the similarity and dissimilarity of CCU daily living routines to the individual's usual routines. Most patients admitted to the hospital experience some degree of change in their usual rest-activity schedule. Hospitals may cause biological rhythms to phase-shift by forcing people to follow a time schedule different from their usual schedule. This could be significant enough to disrupt one's body temperature rhythm.

The literature addresses the critical care environment as one fraught with stimuli and situations beyond the

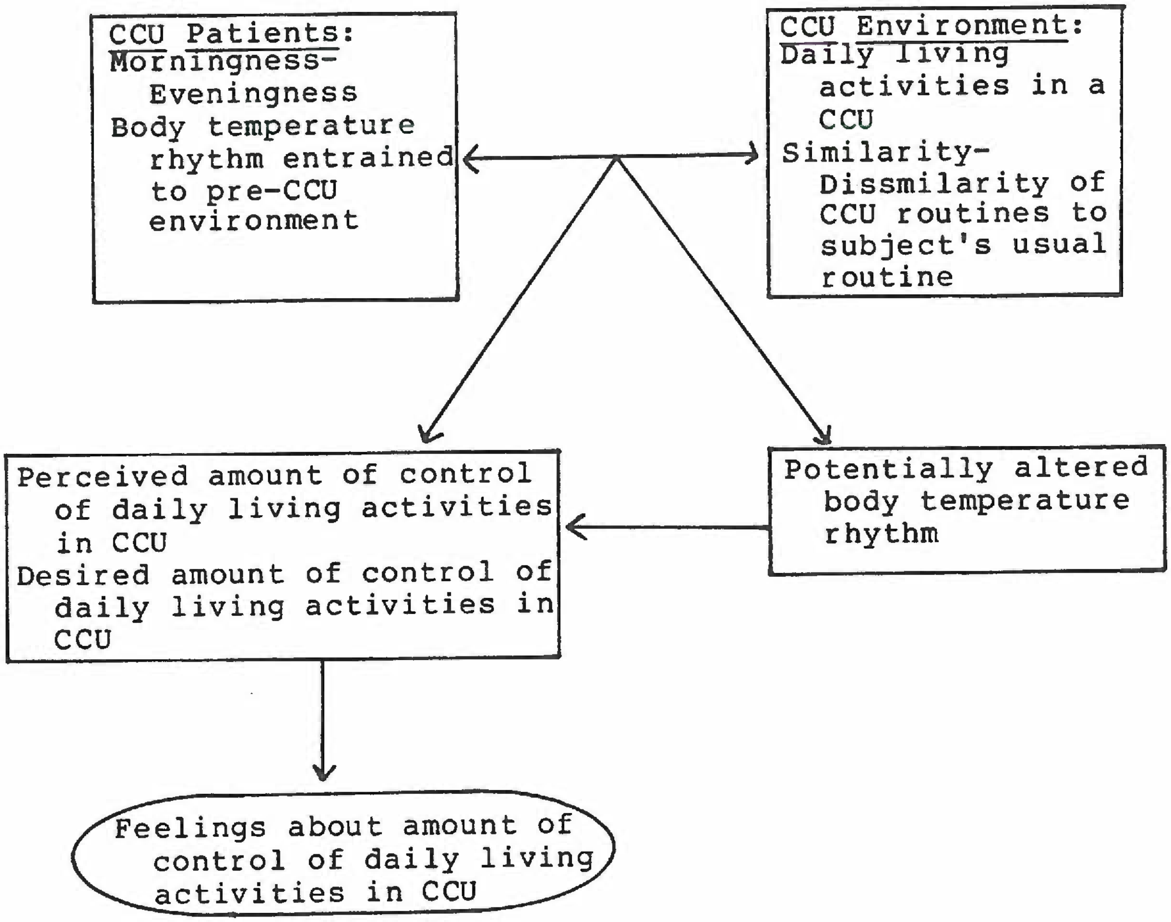

Figure 2. Operational framework for the study of the relationship of perceived control and daily living activities in a CCU.

patient's control. In this environment, even the basic activities of daily living, such as eating, sleeping, and bathing are out of the patient's control. For the purposes of the present study, the CCU environment will be operationalized in the form of daily living activities.

Finally, control may be desirable to most people in a given situation but not desirable to other people in the same situation. On the other hand, desirability of control may be influenced by the character of the present situation. Due to the potential variability in the desire for control, satisfaction with the amount of control subjects have in the CCU will be evaluated by asking patients how they feel about the amount of control the CCU experience gives them with regard to daily living activities.

Hypotheses

The purpose of this study is to identify the contribution daily living activities have on the perception of loss of control for patients in CCU.

The hypotheses are:

1. Cardiac patients who report that their daily living routines are similar to the routines in the CCU will report that they have more control than those whose routines are dissimilar from the unit routines.

2. Cardiac patients who report that their daily living routines are dissimilar from the routines in the CCU will report that they have less control in the CCU than those whose routines are similar to the unit routines.

3. Subjects who describe themselves as morning people will report that their normal daily living routines are similar to the routines in the CCU.

4. Subjects who describe themselves as evening people will report that their normal daily living routines are dissimilar from the routines in the CCU.

5. Cardiac patients who desire more or less control than they have over their daily living routines in the CCU will report more negative feelings about the amount of control they have in the CCU.

6. Cardiac patients who have the amount of control they desire over their daily living activities in the CCU will report more positive feelings about the amount of control they have in the CCU.

7. Cardiac patients whose temperature rhythms have peak temperatures within the expected time interval will perceive that their routines are similar to the routines in the CCU.

CHAPTER THREE

Methods

The descriptive design used in this study is appropriate for identifying factors that influence a concept. In this case, some of the factors that influence patient perception of control in the CCU were explored by means of a brief questionnaire rating daily living activities in the CCU, a short interview focusing on the subject's usual routine, and 48 hours of temperature measurements assessing stability of body temperature rhythms. The following sections describe the setting and sample selection, instruments, procedures, human rights protection, questionnaire scoring, and analysis that were used in this study as well as efforts made to control anticipated research problems.

Setting and Sample Selection

The study was performed in a 12-bed CCU in a 420-bed, private medical center in a major metropolitan area in the northwest United States. A CCU was chosen because of the researcher's previous experience with powerlessness in a CCU setting and because the literature review supports the connection between control and cardiac disease, especially MI and RVT.

To be included in the study, subjects had to be: (a) alert and oriented, (b) less than 75 years old, (c)English-speaking, (d) in the CCU for at least 48 hours, and (e) in a private room. Exclusion criteria included: (a) endotracheal intubation, (b) cardiac arrest with residual neurological effects, (c) cardiogenic shock, (d) presence of intra-aortic balloon pump, and (e) blindness.

Instruments

Three tools were used in this study:

1. Patient Profile (Appendix A) consists of demographic data and questions regarding: (a) primary and secondary diagnoses, (b) length of present hospitalization, (c) existence of previous critical care admissions, and (d) ME. In order to evaluate socioeconomic status, patient's and spouse's occupations were asked (Featherman & Stevens, 1982). Identification of insurance and work status on the basis of yes/no questions were included because of the researcher's anecdotal experience, which gave the impression that patients who are uninsured, and/or without financial support, demonstrate more powerless behaviors than those who are less financially threatened by hospitalization.

2. Biological Rhythm Assessment Form (Appendix B) was used to document date, exact time, and patient's oral temperature along with factors that may have inadvertently influenced the accuracy of the temperature measurement. Suggested factors included hot or cold drinks, ice chips, eating, or mouth care if they occurred within 20 minutes of the temperature recording. The time of administration, name, and dose of antipyretic medications were recorded. In addition, it was noted if the patient appeared to be asleep for more than 20 minutes out of the hour before the

temperature was taken.

3. Perceived Control Questionnaire (Appendix C) consists of two parts. The first part has three sections which ask patients to rate: (a) the amount of control they have over daily living activities in the CCU, (b) the amount of control they would like over daily living activities in the CCU, and (c) how similar or dissimilar these activities in the CCU are to their usual routine. The subjects were asked to express each rating on a verbal rating scale. This format was chosen because it is familiar to most CCU patients in that it is commonly used as a means for evaluating chest pain. For the first question, zero means they perceive they have no control, and ten means they perceive they have complete control, over the listed activities in the CCU. For the second question, zero means they would like no control, and ten means they would like complete control, over the listed activities in the CCU. For the third question, zero means the activities in the CCU are not at all similar to their usual routine and a ten means the activities in the CCU are very similar to their usual routine. The daily living activities evaluated by the questionnaire are: (a) the time subjects go to sleep at night, (b) the time they awaken in the morning, (c) when they bathe, (d) when they eat, and (d) what they eat. Although what the patient eats is not an activity, it was retained in the questionnaire due to the researcher's interest and it will be analyzed as a separate project.

The second section of the Perceived Control Questionnaire (PCQ) asks patients to rate how they feel about the amount of control they have over daily living activities in the CCU. Patients were asked to rate the four feelings of satisfaction, happiness, contentment, and frustration on a scale of 0-10 with zero meaning the most negative end of each feeling and ten meaning the most positive of each feeling.

Since no tools were available to assess control of daily living activities in the CCU, the three tools were developed by the researcher. Simulated testing was done on the PCQ by several adult professional and non-professionals to evaluate ease in using the tool.

4. The thermometers that were used for data collection were those already located in the CCU which are IVAC Model #2080A. These instruments self-calibrate each time the probe is removed from its holder for a temperature measurement. The thermometer's microprocessor computer sends a message to the operator if the calibration is inaccurate. According to the IVAC Corporation, the model 2080 is accurate within ±0.1 degree Celsius when tested in a water bath against a calibrated thermometer (G. Brdlik, personal communication, December 3, 1990). In this CCU, one thermometer is used for each group, or pod, of four patients; therefore, the same thermometer was used for each patient as long as the patient remained in a given pod. This supports the need for data to be reproducible when

analyzing rhythmicity (Halberg et al., 1972).

Temperatures were measured in the preferred right or left sublingual pocket (Erickson, 1976). Sublingual oral temperatures have been shown to correlate well with pulmonary artery temperatures (Laurent, 1979). Before the data collection began, the nursing staff was instructed to use the sublingual cavities and this was highlighted on the instruction sheet that accompanied each Biological Rhythm Assessment Form (BRAF). The investigator periodically surveyed bedside nurses to assure that this technique was being used. Further instructions regarding use of the BRAF and/or proper temperature technique were given to nursing staff as needed; this was required by nurses who had not attended inservices and affected approximately one-third of the sample.

Procedures

Prior to data collection, staff nurses in the CCU were instructed in use of the BRAF and were consulted for any tool or collection problems that could be prevented. The tool and direction sheet were placed in each admission documentation packet used by the nursing staff. Inclusion and exclusion criteria were listed in the directions that accompanied each tool so that staff only needed to collect data on potential subjects. If the staff eliminated a patient on admission due to the inclusion or exclusion criteria, the investigator made a notation on the patient's kardex indicating elimination from the study. The investigator flagged the clipboard of each subject entered into the study by the nursing staff; they appreciated this reminder.

The BRAF was completed by the staff nurses in the CCU. Data collection regarding temperature measurements began on admission and continued according to the every-four-hour CCU standard with the addition of information listed on the BRAF. The added information attempted to identify patient-related factors that may have influenced the accuracy of the temperature measurements. Suggested factors included recent (within the last 20 minutes) hot or cold drinks, ice chips, meals, mouth care, and sleep. The staff nurses measured and recorded patients' oral temperatures with an IVAC Model #2080A thermometer every four hours, indicated recent sleep episodes, and noted the factors that may have influenced accuracy of the temperature measurement. The staff nurse recorded antipyretics (name, dose, route, and time) used during data collection. The tool remained on each patient's bedside clipboard during the study. More frequent temperatures were documented, if taken, but were not requested so that an accurate impression of the CCU was maintained for the patient.

Staff continued to collect data until: (a) the patient transferred from the unit, (b) at least 48 hours of data were collected, (c) the patient declined to participate in the study, or (d) the researcher notified nursing staff that the study was completed. Once either one of these conditions was met, the BRAF was collected by the investigator and a notation was made on the patient's kardex indicating the patient's study status. Due to the necessity for involving multiple staff members in the data collection, interrater reliability was impossible to establish and is a limitation to the study. The investigator was present in the CCU daily to recruit patients for the study, administer questionnaires, complete profiles, and address any problems the nursing staff were having with the study. The investigator made periodic contact with the evening and night shifts to assure their understanding of, and compliance with, the study protocol.

After informed consent was obtained from each subject, the PCQ was administered by the researcher. Patients were asked to rate each activity or feeling in each section on a scale of 0-10. The researcher read the questions to the subjects and the subjects were given as much time as they needed to make their responses.

Information on the Patient Profile (PP) was obtained by the researcher after the PCQ had been administered. Questions 1-8 were taken from the medical record. Questions 9-18 were answered by the patient during the investigator's interview.

Protection of Human Subjects

Permission to conduct the study was obtained from the Institutional Review Board (IRB) of Oregon Health Sciences University and the IRB and Nursing Research Committee of the institution where the study was conducted. Fifteen cardiologists signed a general consent for the investigator to include their patients in the study. Entry into the institution was obtained through the Director of Education and Research for the Department of Nursing.

Patients were identified as potential subjects by the nursing staff of the CCU on admission to the unit, based on inclusion and exclusion criteria. Collection of temperature data as denoted on the BRAF was started on admission; information on this tool was simply documentation of standard CCU nursing care and did not impact the patient in any way. Written informed consent for participation in the study was obtained by the investigator from each subject prior to chart review and administration of the PCQ and PP. In view of the unscheduled nature of CCU admissions, it was impossible for informed consent to be obtained in advance and it was not feasible for the investigator to be present at the time of each admission. Moreover, it was not medically appropriate to approach subjects about participation in the study until their medical condition had stabilized. If participation in the study was declined, data collected on the BRAF beforehand was destroyed by the investigator.

Participation by subjects who met inclusion and exclusion criteria was voluntary. The investigator approached potential subjects about the study only after the bedside nurse deemed the timing appropriate medically and asked the patient if he or she would be interested in discussing participation in the study with the investigator. The consent form is contained in Appendix D.

Patients derived no direct benefit from this study; however, future CCU patients may profit from improved delivery of nursing care. The only risk for the patient was mild inconvenience incurred during the approximately 15 minutes that it took to complete the PCQ and the PP. There was no cost to the subjects. Subjects were assured that any information they gave the investigator would be kept strictly confidential. No patient names were used in the study; patients were given a code number by the investigator as they were entered into the study. Patient medical record numbers were used on the BRAF for convenience of the nursing staff. The investigator replaced the medical record number with the study code number when the BRAF was complete.

Questionnaire Scoring

The first three parts of the PCQ were scored similarly. Scores from 0-10 were based on the subject's responses to each of the rating scales as follows: (a) For the scale indicating how much control subjects perceived they had over the first four activities listed, "No Control" was equal to zero and "Complete Control" was equal to ten; (b) for the scale indicating how much control the subject would like to have over the first four activities, "No Control" was equal to zero and "Complete Control" was equal to ten; and (c) for the scale indicating how "Similar" or "Dissimilar" CCU activities were to the subject's usual routines, those activities that were "Not at all similar" were equal to zero and those that were "Very Similar" were equal to ten. The ratings of the first four activities under each question were added together to yield a composite score range from 0-40 for each of the three questions, producing a control score, a desired control score, and a similarity score.

Each feeling in Part Two of the PCQ was scored with a range from 0-10 based on the subject's verbal rating. The most negative end of each feeling was scored with zero and the most positive end was scored with ten. A composite feeling score was calculated for each subject.

In order to determine if any one of the activities or feelings had been rated very differently from the rest of the activities or feelings, frequency distributions for each rating scale were reviewed. The only disparate subscale was bath time on the similarity scale which had a low mean of 2.9 and a low median of 0.0. Similarity of bath time and eating time were eliminated from the analysis of Hypotheses 3 and 4 because they are not conceptually related to morningness-eveningness.

Statistical Analysis

The data analyses were performed on a MacIntosh SE computer using StatWorks and Cricket Graph (Cricket Software) for the frequency distributions and statistics. Cosinor analysis was performed using StatWorks and an Excel (Microsoft) program written by Felver. Confirmatory cosinor analysis was performed using a program written by Johannes (1984) and modified by Zucker, Reith, and Felver.

Hypotheses 1 and 2.

Hypotheses 1 and 2 were analyzed together. These hypotheses look at the relationship between the subject's perceived control and similarity of CCU routines to the subject's usual routines. The expected relationship was that those who have similar routines would perceive more control and those who have dissimilar routines would perceive less control. In order to decide how to analyze this data statistically, the frequency distributions of the results were plotted first. Since both variables were continuous, Pearson's $\underline{r}$ was calculated. A significance level ≤ 0.05 was set to denote statistical significance.

Hypotheses 3 and 4.

Hypotheses 3 and 4 were analyzed together. They examine the relationship between morningness-eveningness and similarity of routines in the CCU. The expected relationship was that those who refer to themselves as morning people would report similar routines and those who consider themselves evening people would report dissimilar routines. Morningness-eveningness (ME) is a dichotomous variable obtained by patient interview. Those subjects who said they were neither were eliminated from this portion of the analysis, as were the subjects who gave inconsistent ME information on the PP. Since it is conceptually most appropriate to relate ME to sleep-wake cycles, similarity scores derived from sleep and wake similarity ratings were combined to form a composite sleep-wake score.

Since the similarity scores were continuous, a one-tailed t-test was used for analysis. In view of the small number of evening people, the non-parametric, one-tailed Fisher's exact test was also used to test this relationship. A significance level 0.05 was set to denote statistical significance.

Hypotheses 5 and 6.

Hypotheses 5 and 6 were analyzed together. They examine the relationship between the desire for control and how subjects feel about the amount of control they have in the CCU over their daily living activities. The expected relationship was that those who did not have the amount of control they desire would report negative feelings about the amount of control they have; while those who had the amount of control they desire would report positive feelings about the amount of control they have. For each of the four daily living activities, a difference score was calculated by subtracting the perceived control score from the desired control score. A mean of these four scores was calculated to give a mean difference score for each subject and for the sample. A mean difference score of zero meant that the subjects had the amount of control they desired. Those subjects whose mean difference scores were less than one had more control than desired. Those subjects whose mean difference scores were greater than one desired more control.

To test the hypotheses, the relationship between the difference scores and the feeling scores was established. Since both variables were continuous, Pearson's r was used for analysis. In view of the difficulty subjects had in answering the desire section of the PCQ, Pearson's r was used to examine the relationship between perceived control scores and feeling scores. A significance level 0.05 was used to denote statistical significance.

Hypothesis 7.

In hypothesis 7, the expectation was that subjects whose temperature rhythms had peak times within the expected time interval would perceive the CCU routine as similar to their usual routine. Two methods were used to determine if a subject's temperature rhythm peaked in the expected time range. First, each patient's temperature rhythm was graphed and analyzed separately. Four temperature measurements from three subjects were eliminated from both analyses due to nursing documentation of factors that adversely affected their accuracy. Temperature rhythms were graphed over time to observe for temperature peaks at the expected times. Second, cosinor analysis was performed on each subject's temperature measurements to calculate the characteristics of the rhythm and test for statistical significance. This was calculated by the statistical package noted above.

Cosinor analysis is "the fitting of a cosine curve to a rhythm by the method of least squares regression" (Minors &

Waterhouse, 1981, p. 320). It is used for data that are known to vary over time. In cosinor analysis, data are fitted to a predetermined period, which is a 24-hour period for body temperature rhythms. The exact time of the data collection is entered and it need not be at regular intervals (Halberg, Johnson, Nelson, Runge, & Sothern, 1972). The characteristics of a rhythm that cosinor analysis provides are: (a) mesor, time-adjusted mean or the value around which the rhythm fluctuates; (b) acrophase, clock time of the peak of the fitted cosine curve; and (c) amplitude, height from mesor to acrophase. The amplitude describes the degree of fluctuation of the data (which is useful in judging clinical significance) and the acrophase describes the timing of the peak of the rhythm with relation to the external environment (Halberg, 1977). The null hypothesis is that there will be no amplitude to the fitted curve; therefore, data are cyclic and a rhythm is statistically significant at a level of 0.05 if the null hypothesis is rejected (Felver, in review).

Since the sleep-wake cycle is an advisable reference point for discussing biological rhythms (Halberg, 1977), subjects whose peak times are 11-15 hours after midsleep were considered within the expected interval for body temperature rhythm. Midsleep was calculated for each subject by subtracting usual awakening time from usual bed time; these times were self-reported on the PP. This formed two groups, one whose temperature rhythm peaks were within the expected interval and one whose temperature rhythm peaks were not within the expected interval. The two groups were formed in two different ways, one using cosinor analysis and the other using visual inspection. Since the similarity scores were continuous and the sample size was small, a 2x2 table and a one-tailed Fisher's exact test was used to test the relationship between similarity and subjects whose temperature peaks were in the expected time interval by either cosinor analysis or visual inspection. A significance level of ≤ 0.05 was used to denote statistical significance.

In summary, each hypothesis was analyzed by determining the frequency distribution of the data and using the most appropriate statistical analysis for the nature of the data.

CHAPTER FOUR

Results

Results of this study will be presented in this section beginning with a description of the sample and of the scores on the Patient Control Questionnaire (PCQ). Following this, the results of the statistical analysis of each hypothesis will be presented.

Sample Description

The sample consisted of 17 subjects who were patients in the CCU described in the methods section and who met the inclusion and exclusion criteria. All 17 had cardiac diagnoses of unstable angina, coronary artery disease, or MI. Twelve patients (71% of the sample) underwent angiogram and/or angioplasty during their CCU stay and two more were scheduled for studies later in their admissions. There were six females (35%) and 11 males (65%) in the sample. The age range of the sample was 42-75 years with a mean (±SD) age of 62±10. Ten of the subjects (59%) had been in some type of critical care unit at another time in their lives.

The length of time the subjects were in the CCU prior to interview ranged from 32-79.5 hours with a mean stay of 47 hours and a median stay of 46 hours. The subject who was in the CCU for only 32 hours had been transferred from another facility and had a combined length of CCU stay of 63 hours before interview. Three other subjects had been in other hospitals for one or two days prior to admission to this CCU. One subject had been in two other hospitals before transferring to this CCU, giving him a total hospitalization of nine days prior to his interview for this study. For these five subjects, their length of stay in this CCU was the time used to determine the above length of stay data. The subject with the 79.5 hour stay felt too ill to be interviewed earlier.

Information regarding occupation gathered by the investigator was not complete enough on five subjects, making it difficult to determine socioeconomic status (Featherman & Stevens, 1982). For this reason, socioeconomic status will not be considered in the data analysis.

Morningness-eveningness (ME) was considered clearly differentiated only if the subjects' answers to questions 13-18 on the Patient Profile (PP) were consistent. The sample consisted of three evening people (18%) and 10 morning people (59%). The four subjects (24%) who gave inconsistent answers on the PP were considered neither morning nor evening people and were eliminated from the analysis of the third and fourth hypotheses.

Two subjects refused to participate in the study. One was a 46-year-old male who was told on the day of interview that he needed a heart transplant. Although he felt too ill to think about rating the activities, he expressed interest in helping with the study. The second refusal was from a patient who was withdrawing from alcohol and having a difficult time accepting the fact that his cardiomyopathy was of alcoholic origin.

Patient Control Questionnaire Scores

Each section of the PCQ was scored separately with descriptive statistics calculated, using StatWorks, in the form of composite scores and individual activity scores. The statistics are displayed in Table 2. Frequency distributions for all four scores revealed continuous data.

In the similarity scores, sleep and wake time means were considerably higher than the mean of the composite score and the means of the other activities. As noted in Table 2, sleep and wake time similarity scores were combined for both morning and evening people and these scores were used to analyze hypotheses 3 and 4.

The scores on the feeling section showed little variability. They were predominantly positive with a composite mean of 35 and subscale means ranging from 8.2-9.3. The range of scores on the composite feeling scale was only 15.5 out of a possible range of 40 and only five out of a possible range of 10 on three of the four subscales.

Hypotheses

Due to the complementary nature of the first six hypotheses, they will be discussed in pairs and followed by the seventh hypothesis.

Hypotheses 1 and 2.

Hypotheses 1 and 2 proposed a relationship between the subjects' perceived control and similarity of CCU routines to the subjects' usual routines. Since both the control and

Table 2

Descriptive Statistics for Patient Control Questionnaire

	MEAN	STANDARD DEVIATION	STANDARD ERROR	MEDIAN	RANGE MINIMUM	RANGE MAXIMUM
CONTROL YOU HAVE						
SLEEP TIME	8.5	2.58	0.6	10.0	0.0	10.0
WAKE TIME	5.9	3.58	0.8	8.0	0.0	10.0
BATH TIME	5.1	4.25	1.0	5.5	0.0	10.0
EAT TIME	3.5	4.07	0.9	1.0	0.0	10.0
COMPOSITE	23.2	10.72	2.6	24.0	0.0	39.0
DESIRED CONTROL						
SLEEP TIME	7.0	3.57	0.8	8.5	0.0	10.0
WAKE TIME	5.9	3.85	0.9	8.0	0.0	10.0
BATH TIME	4.3	3.71	0.9	5.0	0.0	10.0
EAT TIME	5.5	3.47	0.8	5.0	0.0	10.0
COMPOSITE	22.8	11.70	2.8	25.0	5.0	40.0
SIMILARITY						
SLEEP TIME	6.4	4.03	0.9	8.0	0.0	10.0
WAKE TIME	6.7	3.80	0.9	8.0	0.0	10.0
BATH TIME	2.9	3.75	0.9	0.0	0.0	10.0
EAT TIME	4.0	3.69	0.9	5.0	0.0	9.5
COMPOSITE	20.1	10.45	2.5	20.0	0.0	38.0
AMSLEEPWAKE	16.0	4.19	1.3	17.0	8.0	20.0
PMSLEEPWAKE	7.0	6.08	3.5	10.0	0.0	11.0
FEELINGS						
SATISFACTION	9.3	1.42	0.3	10.0	5.0	10.0
HAPPINESS	8.8	1.46	0.3	9.0	5.0	10.0
CONTENTMENT	8.2	1.67	0.4	8.0	5.0	10.0
FRUSTRATION	8.5	2.37	0.5	10.0	2.0	10.0
COMPOSITE	35.0	4.90	1.1	35.0	24.5	40.0
DIFFERENCE						
SLEEP	-1.47	4.54	1.10	0.0	-10.0	10.0
WAKE	-0.03	4.55	1.10	0.0	-8.0	10.0
BATH	-0.76	4.61	1.12	0.0	-8.0	5.0
EAT	1.19	4.98	1.21	0.5	-6.0	10.0
MEAN	-0.09	3.39	0.82	0.0	-7.6	4.5

similarity scores were continuous, Pearson's r was computed. The correlation between perceived control and similarity scores was 0.47 with p=0.058. With the small sample size of 17, there was a 50% power of detecting a relationship of this magnitude at a significance level of 0.05 (Cohen, 1988).

Hypotheses 3 and 4.

Hypotheses 3 and 4 addressed the relationship between ME and similarity of CCU routines to the subjects' usual routines. The sample consisted of three evening and 10 morning people; as noted above, four subjects were eliminated from analysis of hypotheses 3 and 4 because of inconsistent answers on the PP.

Since it is conceptually most appropriate to relate ME to sleep-wake cycles, similarity scores for bath and eat time were eliminated from this analysis. Composite scores were derived for similarity of wake and sleep time; their descriptive statistics are noted on Table 2 as "amsleepwake" and "pmsleepwake".

Morningness-eveningness is a dichotomous variable and similarity is a continuous variable, justifying the use of one-tailed t-tests to analyze their relationship. The morning subjects had a wake-sleep similarity mean of 17.3 with a standard deviation of 3.67 on their similarity scores; while the evening subjects had a wake-sleep similarity mean of 7.0 with a standard deviation of 6.08 on their similarity scores. A one-tailed t-test supported the hypotheses with $\underline{p}<0.01$.

Due to the small number of subjects, a Fisher's exact test based on a 2x2 table was also used to examine the relationship between ME and similarity of routines. To do this, similarity was considered present when a subject had a composite score of 14-20 on the wake and sleep variables. In the morning group, there were eight subjects (80%) with a score of 14-20 and two (20%) with a score of 0-13; in the evening group, all three subjects had scores in the 0-13 range. The Fisher's exact test revealed that similarity was significantly related to ME with a $\underline{p}<0.035$.

Hypotheses 5 and 6.

Hypotheses 5 and 6 focused on the relationship between desired control and feelings about the amount of control the subjects had. A difference score was calculated for each subject by subtracting the control the subjects reported they had from the amount they desired over each daily living activity in the CCU. Next, a mean difference score for each subject and for the group was calculated and used for the analysis.

A positive difference score means the subject desired more control than they had and a negative difference score means the subject had more control than they desired. A score of zero means the subject had the amount of control desired. Two subjects (12% of the sample) had the amount of control they desired (difference score of zero), eight subjects (47%) desired more control than they had (positive difference score), and seven subjects (41%) had more control than they desired (negative difference score).

No correlation was found between the mean difference scores and the composite feeling scores ($\underline{r}=0.13$; $\underline{p}=0.665$). However, when the composite perceived control scores themselves were correlated with the feelings scores, a significant correlation was found ($\underline{r}=0.55$; $\underline{p}=0.035$).

Hypothesis 7.

Hypothesis 7 stated that subjects whose temperature rhythms had peaks within the expected time interval for healthy subjects would perceive the CCU routine as similar to their usual routine. Due to the conceptual relationship of the sleep-wake cycle to entrained biological rhythms (Minors & Waterhouse, 1981, 1986), sleep and wake similarity scores were combined and used to test this hypothesis.

Six subjects (35%) had peak times in the expected interval by visual inspection of the subjects' temperature graphs.

Two subjects (11%) had statistically significant 24-hour rhythms and peak times in the expected interval by cosinor analysis. Subjects 1 and 4 had peaks in the expected time interval by both visual inspection and cosinor analysis (See Table 3). Figure 3 displays Subject 4's temperature data with the appropriate fitted cosine curve superimposed on the graph. Subject 14 had a significant cosinor rhythm ($\underline{p}<0.008$) but the acrophase and visual peaks occurred during midsleep. Subject 15 had temperature peaks

Table 3

Cosinor Analysis Statistics for Subjects with Significant Body Temperature Rhythms

	p Value	R^2	Mesor ± Standard Error	Peak Time	11-15 Hours After Mid-Sleep	Amplitude (peak to trough) °C
Subject 1	0.083	46.3%	36.9 ±0.1	15:12	11:52-15:52	0.6
Subject 4	0.018	55.4%	36.9 ±0.1	19:12	14:07-18:07	0.7

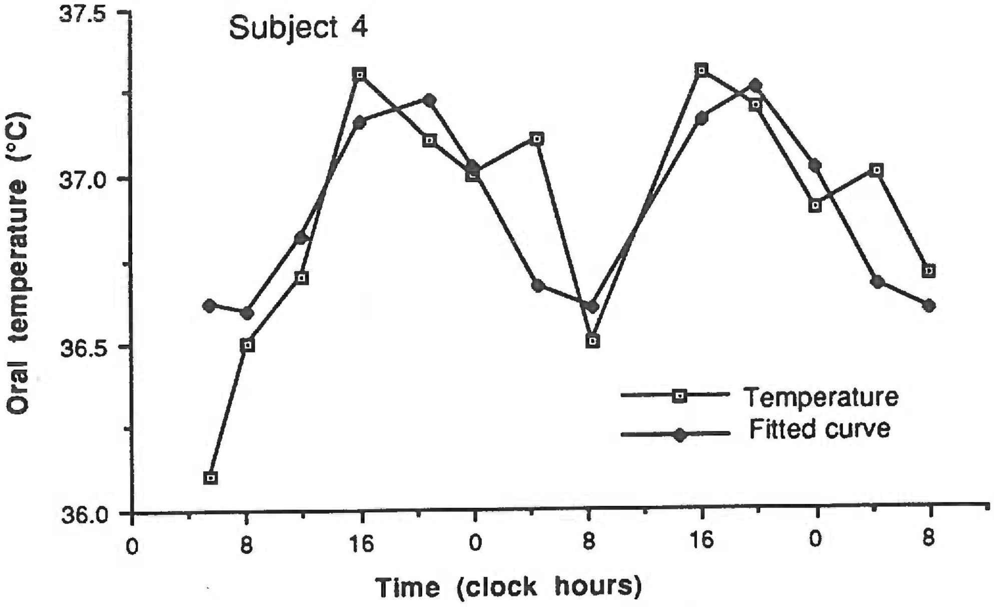

Figure 3. Temperature graph for Subject 4.

18 hours after midsleep by visual inspection. Subjects 14 and 15 were eliminated from the analysis of this hypothesis because their temperature peaks did not fall in the expected interval of 11-15 hours after midsleep.

Since the classification of the timing of the subjects' temperature peaks is a dichotomous variable (in or not in the expected time interval) and the similarity scores are continuous, Fisher's exact tests were used to test this hypothesis for this small sample. Separate one-tailed Fisher's exact tests were done for the cosinor-determined ($p<0.40$) and visually-determined ($p<0.16$) groups. Neither method showed a relationship between similarity scores and those subjects whose temperature peaks were in the expected time interval.

Of note, is the fact that both subjects with significant 24-hour rhythms and peak temperatures in the expected interval by cosinor analysis reported that CCU routines were similar to their usual routines. In addition, 83% of the subjects with visual peaks in the expected time intervals reported similarity scores in the 14-20 range.

CHAPTER FIVE

Discussion

In this section, the findings of the present study will be discussed in terms of their significance, reliability, and contribution to the development of the concept of control. The discussion will begin by reviewing sample and setting implications and recommendations for improving the Patient Profile (PP). It continues with an analysis of the results of each set of hypotheses which includes a critique of the Patient Control Questionnaire (PCQ).

Sample and Setting

The sample of 17 subjects was obtained during a period of 18 days. During that time period, 12 patients were transferred from the CCU before 48 hours eliminating them from the study; nine of these were transferred to the telemetry floor and three to the angioplasty rooms. In addition, many of the patients in the study were interviewed just prior to transfer, indicating the short length of stay patients are experiencing in that CCU.

The character of the sample deserves comment. As noted in the results section, 71% of the subjects underwent angiogram and/or angioplasty before their interview with another 12% scheduled for studies post-interview. The growth of interventional cardiology being seen in the 90's may change the character of CCUs significantly enough to warrant a different approach to studying the impact of this environment on patients. It may be necessary to study short-term CCU patients from a more appropriate perspective and to confine the study of control to those patients who remain in the critical care environment long enough to become familiar with the environment.

Age greater than 75 was one of the exclusion criteria for this study. One patient who had turned 75 two months prior to the study was retained in the study because he was the only subject that had additional diagnoses of ventricular ectopy although he had not experienced sudden cardiac death. This subject's perceived control, similarity, and feeling scores were 25.5, 26.0, and 32.0, respectively, all within one standard deviation of the mean composite scores. His desire score of six was considerably lower than the mean of 22.8 but he had a great deal of difficulty responding to the control subscale.

Finally, generalizability of the results of this study is limited due to the small size of the sample and the use of only one CCU. Further studies of this nature should include more diverse cardiac diagnoses and should have a large enough sample to compare long and short term CCU patients. Comparing different CCUs may reveal longer stays and/or different therapeutic approaches which may impact the results of studies on patient perceived control in CCUs.

Patient Profile

The PP was developed to gain demographic and morningness-eveningness (ME) information about the subjects. Due to the investigator's lack of experience with the scale that was to be used to classify socioeconomic status (Featherman & Stevens,1982), insufficient descriptions of occupations was obtained making it difficult to use the scale. The investigator found it more comfortable and useful to ask what the patient's "spouse or partner's" occupation was. Only one subject had no insurance; all of her scores were within one standard deviation of the mean scores.

In addition, the ME questions should be adjusted for ease in interviewing. The order should be changed to ask question 13 after 14, 15, and 16 have been asked. Question 13 should be reworded to read, "For the week before you came to the hospital, were you awakening during the night more than usual?" This allows the subject time to think in terms of pre-hospitalization before hearing the question. Question 16 should be changed to read "Have you been on this sleep-wake cycle during the last week?" If the answer is negative, the interviewer can ask for a description of the subjects' last week's sleep-wake cycle.

Hypotheses

The results of each set of hypotheses will be discussed in terms of the PCQ and their implications for the concept of control.

Hypotheses 1 and 2.

Hypotheses 1 and 2 proposed that cardiac patients who reported CCU routines as being similar to their usual routines would report more control over their daily living activities and that those who reported dissimilar routines would report less control. A definite trend is noted in this relationship based on an r=0.47 with a close-to-significant p value of 0.058. This occurred despite the fact that the small sample size reduced the power of detecting a large effect size difference to 50%. The study was discontinued with a sample size of 17 due to problems with other portions of the PCQ which will be discussed later. Increasing the sample size to 30 would have increased the power to 80%; it would have required a sample of 50 subjects to reach the desired power of 95%.

The trend shown in the correlation between perceived control and similarity of routines definitely supports the usefulness of further study of this relationship. Anecdotally, several subjects commented on similarity of routine during the control questions which were presented before the similarity questions. It may be that dissimilarity of hospital routines from an individual's usual routine promotes a perceived loss of control. Consequently, dissimilarity of routines may be a risk factor in the development of powerlessness in the clinical setting.

Validity of the PCQ in measuring perceived control warrants comment. Anecdotally, several of the subjects related perceived control to quality of care. Questions then arise about whether control and quality of care are similar from the patient perspective or if the tool was not sensitive enough to distinguish between the two.

The other issue that enters into an assessment of patient control is that of the nurse's approach to patient care. Several writers have discussed the impact of nursing style on perceived control (Colling, 1985; Roberts, 1986; Ryden, 1984). This study would have been strengthened by a measure of nursing styles differentiating those who encourage patient control from those who do not. Since the nursing staff was aware of the nature of the study, it is possible they altered their approach to patient care during the study. On the other hand, this CCU was chosen because the researcher observed nurse behaviors in this unit that foster patient control; a study that includes more than one unit would need to include an assessment of nursing approach.

Finally, the issue of whether control over the timing of daily living activities is a valid measure of control in a CCU is of concern. Are there other issues that are more important to CCU patients? One study that examined control in the cardiac patient did so from the perspective of causation of MI (Affleck et al, 1987). Dennis (1987) found patients more concerned with diagnostic and treatment issues than daily living activities. Other factors not evaluated in this study that may impact patients' perceptions of control in the CCU are length and acuity of illness, physician style and communication, nursing care delivery system, visiting hours, and the individual's social support system. Content validity of the PCQ is addressed further in the discussion of hypotheses 5 and 6.

The short CCU stays may limit the impact of daily living activities on patient control levels. The only study found that looked at this relationship did so after the patients had been in the CCU for at least 48 hours (Kallio & Sime,1980). It may be more useful to examine cardiac patients over the length of their hospitalization or after discharge to obtain a complete picture of the impact of control on their lives.

Hypotheses 3 and 4.

Hypothesis 3 proposed that morning people would report CCU routines similar to their usual routine. This hypothesis is supported by a $\underline{p}<0.035$ on the Fisher's exact test and by a $p<0.01$ on the one-tailed t-test. This is inconsistent with the Floyd (1984) study that showed that neither morning or evening people had routines similar to the routines of a hospital psychiatric unit.

Hypothesis 4 is supported indirectly by noting that none of the evening people had scores that indicated similarity of routines. A larger sample of evening people would strengthen this observation.

If further study of hypotheses 1 and 2 continues to show a relationship between control and similarity of routines, it could be extrapolated that morning people have more perceived control in CCU than evening people have. Nursing assessment and interventions could then be developed that help evening people gain more control of their environment. The disparity between prehospitalization and CCU schedules for evening persons may be one of the factors contributing to loss of control in CCU. Therefore, eveningness may be a risk factor for powerlessness.

Hypotheses 5 and 6.

In hypotheses 5 and 6, desire for control was examined in relation to the subjects' feelings about the control they had over daily living activities in the CCU. Difference scores were not related to feeling scores. On the other hand, composite perceived control scores correlated significantly with feelings scores. This may be related to problems with the PCQ that are discussed below. The finding is not consistent with the studies that found adding desire of control to a measure of control increased predictability (Mullins, 1982; Reid, 1984; Reid et al., 1977).

Fisher's exact tests were used to test the relationship between gender and control and between gender and desire for control. No relationship was found, which is not consistent with the literature (Hickson et al., 1988; Reid et al., 1977). This may be related to the small sample size and/or the younger ages of the subjects in the present study.

Two problems with the PCQ, which may have been averted with more extensive preliminary testing, affect the interpretation of the results of these hypotheses. The first is with section 2 of the PCQ that asked subjects how much control they would like to have over their daily living activities in the CCU. This wording was chosen because of studies that showed that adding desire to control measures improved predictability (Mullins, 1982; Reid, 1984; Reid et al., 1977).

Two of the last four subjects were unable to rate the daily living activities until the investigator prompted them to think about the importance of having control over the activity in question. Anecdotally, other subjects had difficulty with this part of the questionnaire but the investigator did not document this completely until a trend was beginning to show. For this reason, it is recommended that the question be reworded to ask how important control is to the subject. This is based on the general notion in the literature review that the importance of an event impacts one's perception of control (Averill, 1973; Thompson, 1981). It is also recommended that detailed anecdotal notes be maintained by investigators from the beginning of any study, even if that necessitates taping interviews for qualitative analysis later.

Furthermore, several subjects verbalized, without prompting from the investigator, their appraisal of control in the situation of the CCU. Seven subjects (41%) had negative difference scores indicating they had more control than they desired. This is consistent with several writers who noted that people choose to give up their control of a situation because it is less threatening and/or more beneficial for them to do so (Bandura, 1982; Rothbaum et al., 1982; S. M. Miller, 1979; Burger,1989). Cognitive restructuring of a situation may make the individual feel in control of the situation (Reid, 1984; Taylor, 1983). Therefore, it may improve predictability to differentiate the importance of control of daily living activities, in general, and in the specific situation of the CCU.

The second part of the PCQ that is problematic to the interpretation of the results of hypotheses 5 and 6 is the feelings score. As noted, the scores were heavily clustered on the positive end of the rating scales. One issue is whether the tool was sensitive enough to find variability in this measure if there was any. The subjects had difficulty separating feelings about control from quality of care, as noted by frequent comments to this effect. This raises the issue of the relationship between quality of care and perceived control.

Another consideration regarding the feelings score is that of social desirability. At the request of the institution, the bedside nurse served as an interface between the investigator and the subjects, asking the subjects if they would be interested in talking to the investigator about participating in the study. The nurses were not given a specific script to use in asking the patients about this. Some of them described the investigator as a nurse who works at the hospital and is doing a study. In retrospect, this may have caused the subjects to relate the investigator to their bedside nurse and restrict their comments to positive ones.

Furthermore, being in the threatening situation of a CCU may have influenced the subjects' appraisals of the quality of their care. It would be unacceptable to think that one is receiving less than satisfactory care if one is in a threatening situation. Likewise, dependency on nursing staff for care may cause patients to feel less free to express negative feelings about their care or the staff.

Finally, the feelings score was being used to measure patient outcomes. In light of the literature that describes the reactant and withdrawn behaviors that may result from a lack of perceived control (Perlmuter & Monty, 1977; Taylor, 1979; Mikulincer, 1988; Mullins, 1982; Sulman & Verhaeghe, 1985), a behavioral measure might be conceptually more appropriate for evaluating the outcomes of perceived control.

Interestingly enough, one of the two patients who refused to be in the study was acting out at the staff and the other had withdrawn into a world of pain relieving narcotics. Other research methods may be needed to study these kinds of patients. One suggestion is that clinical experts working closely with reactant and helpless patients use clinical ethnographies as a qualitative measure of behavior. Following analysis of several ethnographies, it may be possible to develop a measure of behavior that could be used quickly at the bedside to evaluate responses to loss of control.

Hypothesis 7.

The findings of this study showed no statistical relationship between similarity of sleep-wake scores to subjects whose temperature rhythms peaked in the expected time interval for healthy adults. This is not consistent with the literature that describes the sleep-wake cycle as the most influential zeitgeber (Minors & Waterhouse, 1981, 1986). This raises concern about the information recorded on the Biological Rhythm Assessment Form (BRAF) from two perspectives.

The first issue is related to studies that show that morning people are less adaptable than evening people (Ishihara et al., 1987; Lavie & Segal, 1989). Of the 11 subjects that had no demonstrable peaks in the expected interval, seven (64%) were morning people. Only one of these subjects had a hospital stay greater than 48 hours, which is less than the amount of time needed to complete a phase-shift of the temperature rhythm (Minors & Waterhouse, 1981). The subject with the length of stay greater than 48 hours had a total hospitalization of nine days. However, two environmental factors noted below may have influenced this subject's temperature rhythms; he had an angiogram done shortly before one of his expected peak intervals and he had two slight 8:00 temperature dips which may be related to bath times.

Of the three evening people, one had peak temperatures in the expected interval by visual inspection, one had peak temperatures 18 hours after midsleep by visual inspection, and one had no identifiable temperature rhythm. The sample is too small to warrant any conclusion.

The second issue concerns the temperature data itself, about which several observations can be made. The abnormal timing of temperature peaks noted in Subject 15's data is consistent with the Tweedie et al. study (1989) that showed varied peak times in ICU patients. Subjects 11 and 16 had visual evidence of body temperature rhythms shorter than 24 hours which is consistent with Felver's (in review) study of critically ill patients. Tylenol was given frequently to these subjects due to headaches or back pain but it impacted only temperature recordings that were above normal. All but one subject had at least one temperature recorded exactly on the hour; 51 (26%) of the 196 temperature measurements were recorded exactly on the hour. This raises concerns that the times recorded on the BRAF were not consistently accurate.

Since there were 10 temperature dips at 8:00 in seven subjects, the routine in this CCU of giving baths from 5-7:00 may have influenced the subjects' temperature rhythms. Figure 4 provides an example of possible bath-related temperature decreases. Documentation of baths was not included in the influencing factors suggested or recorded on the BRAF.

Finally, 70% of the subjects underwent invasive procedures in the cardiac catheterization laboratory during, or just prior to, their stay in the CCU. One BRAF had a

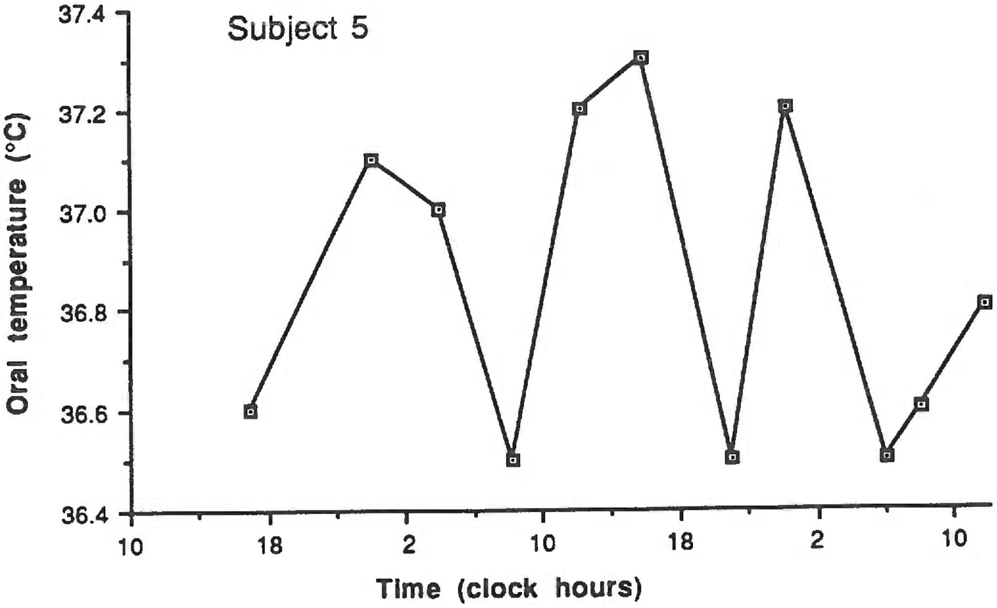

Figure 4. Temperature graph for Subject 5.

nursing notation reporting the subject felt "cold" on return from the lab and eight subjects had their lowest temperatures recorded on return from the lab. This may be related to the ambient room temperature in the lab. In addition, body temperature may be affected by the stress of the procedure and by the dye used for the exams. Future biological rhythm studies in this population should consider the impact that nursing and diagnostic procedures have on body temperature rhythms.

Conclusion

Despite the limited statistical significance of the findings of this study, two clinically important notions are supported. First, a clinical measurement tool was piloted and, with the proposed revisions, has potential for clinical use because of the ease with which it was used for interviewing critically ill patients in this study.

Second, the concept of control is more complex than examined in previous clinical studies. Previous literature assumes the critical care environment promotes loss of control; this was not consistently supported by this study. Appraisal of the situation appears to be an intervening factor in determining an individual's perception of control in a CCU. This study showed a tendency for similarity of CCU routines to an individual's usual routine to impact perceived control scores; this supports the need for further analysis of dissimilarity of CCU routines as a risk factor for loss of control in an acute care setting.

CHAPTER SIX

Summary

The purpose of this study was to explore patient perceptions of loss of control in a critical care unit by focusing on loss of control of daily living activities as experienced by CCU patients. The literature review realized the need for further clarification of the concept of control in general and in relation to specific clinical situations. It also pointed to the impact hospital settings can have on loss of control and on biological rhythms and mood.

The conceptual framework for this study evolved from the literature review and the investigator's clinical experience with perceived loss of control in refractory ventricular tachycardia patients. The definition of control used for this study was that of perceived control which is defined as the perception that an individual has the ability to influence the outcomes of a given situation. When an individual is confronted with aversive situations, the perception of that situation impacts how the situation is viewed and how an individual responds. Desirability of control was assessed to determine the importance of control in the situation of the CCU experience.

The Patient Control Questionnaire (PCQ) was used for subjects to rate, in regard to four daily living activities, the amount of control they had in the CCU, the amount of control they desired, how they felt about the amount of control they had, and the similarity of their usual routines to the CCU routines. The Patient Profile (PP) was used for demographic screening and as an assessment of morningness-eveningness (ME). The Biological Rhythm Assessment Form (BRAF) was used by nursing staff to document body temperature measurements and factors that may have influenced the accuracy of the temperature measurements.

The findings tended to support the hypotheses that proposed a relationship between perceived control and similarity of routines. Data showed a significant relationship between morningness and similarity of CCU routines to the individual's usual routines; eveningness was indirectly related to dissimilarity in that none of three evening subjects reported similar routines.

The data did not support the notion that those who have the amount of control they desire will report positive feelings about that control and that those who do not have the amount of control they desire will report negative feelings about that control. In the analysis, difference scores, calculated by subtracting perceived control scores from desire scores, were not related to feelings scores. However, control scores were related significantly to feelings scores despite the positively skewed feelings scores.

Finally, those subjects whose temperature rhythms had peaks in the expected time interval for healthy adults did not show a statistically significant relationship to similarity of routines. However, a tendency towards this relationship was noted. In addition, several situational variables that may have influenced the subjects' body temperature rhythms were observed.

The limitations of this study are summarized below. Recommendations for future research and practice are then presented and followed by final comments on the implications of this study for nursing.

Limitations

The limitations of this study are summarized on the basis of reliability, validity, and generalizability issues.

Reliability.

The BRAF was completed by the nursing staff in the CCU. Due to the variety of staff participating in the data collection, interrater reliability was questionable. Nursing staff were instructed in the use of the BRAF before the study began but float and on-call staff were not included in the inservices.

Despite follow-up by the investigator, the frequent (26%) use of exact hourly times and the limited documentation of influencing factors reduce the reliability of this data. In addition, the investigator had no way of assessing the placement of the thermometer in the patient's mouth. It has been the investigator's clinical experience that some people have difficulty placing a thermometer in the lateral sublingual pockets and the tool did not include a place for the nurse to document thermometer location. Anecdotally, there was better quality of documentation on the BRAF from the CCU staff who had attended an inservices. Despite this, the investigator chose this mechanism of data collection for convenience and because of the learning experience derived from working with nursing staff on a research project.

On four occasions, nurses noted factors that adversely affected the accuracy of a temperature reading and these values were eliminated from analysis. Environmental factors that may have influenced the temperature data were early morning baths and procedures done in the cardiac catheterization laboratory.

Validity.

Validity is discussed in terms of content and construct validity.

The first validity issue is that social desirability may have biased responses on the PCQ, especially the feelings questions which showed little variability, calling into question the sensitivity of this measure. Social desirability bias may have resulted from the fact the investigator did not specify the approach the bedside nurse should use to ask the subjects about participation in the study. Some nurses said the investigator was a nurse at that institution and others said the investigator was a nurse researcher. Either approach may have influenced subjects to answer in a way that would please their bedside nurse.

In addition, it may have been too risky in the life-threatening situation of a CCU for the subjects to think that their care was anything better than very satisfactory. Subjects verbalized positive comments about their care when the feelings questions were asked, indicating they were not able to separate quality of care issues from how they felt about control of daily living activities.

The second validity issue that may have impacted patient control and responses to the PCQ is the general approach of nursing care in this unit. The researcher chose this CCU because the approach to care supports patient decision-making. In doing so, patient perceptions of loss of control may be diminished. Likewise, since the nursing staff knew the nature of this study, the nursing approach during the study may have supported patient control even more than usual.

Content validity may be questioned in this study by its focus limited to daily living activities. The researcher chose this approach because of personal experiences with refractory ventricular tachycardia patients and studies in elderly persons that showed increased morale with control of daily living activities (Chang, 1978; Colling, 1985; Ryden, 1984).

This study does support the addition of similarity of CCU routine to an individual's usual routine to the list of factors that influence the development of perceived loss of control. However, the scope of control issues in a CCU may be broader than daily living activities, as indicated by studies that address cause (Affleck, Tennen, & Croog, 1987), symptom control (Affleck, Tennen, Pfeiffer, & Fifield, 1987; Dennis, 1987) and adjustment to MI (Johnson, J. L., & Morse, 1990) in relation to control.

In addition, the scope of the concept of control is not consistently discussed in the literature reviewed for this study. Powerlessness, as a nursing diagnosis (Carpenito, 1984; Roy,1984), is related to the helplessness Seligman (1973, 1975) discusses as the end result of multiple loss of control situations. The earlier phase of reactance as a response to helpless situations proposed by some (Mikulincer,1988) has not been addressed in nursing research or nursing diagnosis. The present study lacked a behavior measure which would be needed to identify reactance in a clinical setting. The two patients who refused to participate in the study were described by nursing staff as challenging to care which may have been due to reactance.

Finally, the conceptual point that the meaning of a situation impacts an individual's response to a given situation was weakened by the fact that several subjects had difficulty with evaluating how much control they would like to have over their daily living activities in the CCU. Subjects voiced appraisal of their situation in connection with answering this question. The subjects may have reported high control levels because they had chosen to give the nurse control of some of their situation. It is quite possible that the diagnostic and prognostic uncertainties many of these patients were facing took priority over the importance of daily living activities. On the other hand, any study done with critically ill patients needs to be as simple and concise as possible due to the limited energy levels these patients have.

Generalizability.

Generalizability of this study is limited by several characteristics of the sample, especially the small size (N=17). Another limitation is the use of one CCU which does a high volume of invasive procedures. In addition, although most cardiologists permitted their patients to be in this study, nine patients were eliminated from the study because their physicians had not given permission for their inclusion. Finally, nine other patients were eliminated from the study because they were in the unit less than 48 hours. Longer lengths of stay in a critical care unit may produce more of an impact on control by exposing patients to more loss of control situations.

Recommendations for Future Research

Recommendations for future research involve broadening the sample, refining the instruments, including influencing variables, improving study implementation, and increasing validity of the study.

A larger sample that includes patients from more than one CCU would increase generalizability of this type of study. It would also be beneficial to include patients with varied lengths of stay and cardiac diagnoses. In addition, a larger sample would allow comparison of a cardiac procedure group with a group of patients who did not have a procedure done during their CCU stay.

The PCQ should be changed in two respects. The first change would be to ask subjects to rate the importance of control instead of the desire for control. It may be conceptually necessary to ask this question in a general context as well as the specific context of the CCU setting. The second change involves revision of the feelings score which may not be a sensitive outcome measure in this circumstance. In order to steer subjects away from quality of care and focus them on perceived control of daily living activities, it may be more appropriate to ask subjects how they feel about the amount of control they have over a specific activity.

Two areas of the study were impacted by influencing variables that were not accounted for in the measurements. The first is the BRAF which needs to include additional factors that may affect body temperature, specifically cardiac catheterization procedures and actual bath times.

The second influencing variable that was not measured in the study was that of nursing care approach. This could be addressed by a large sample that includes more than one CCU or by relating individual nursing approaches to each subject's answers on the PCQ.

Implementation of further study would need more inclusive nursing staff inservices and close follow-up at the bedside of temperature measuring techniques. This may require additional investigators or close supervision from the operational managers in the nursing units being studied. In addition, the use of a planned script for the bedside nurses to use when talking to patients about the study would help control for the social desirability factor.

Finally, content and construct validity could be improved by the addition of another method of study. Suggestions include clinical ethnographies, precise recordings of comments made during interviews, and the addition of open-ended questions regarding perceived control. Any of these could be analyzed qualitatively to add to the knowledge base about perceived control. It should be remembered that the intent of this investigator to keep this study simple, in light of the acuity of these patients, is valid.

Significance for Nursing

This study is significant to nursing for three reasons. First, it contributes to nursing research by developing a measurement tool that has potential for use in clinical nursing research. This instrument was used successfully on patients in a CCU, indicating that its simplicity is appropriate for this patient population.

Second, the study contributes to nursing practice by examining the human response to illness and hospitalization in a CCU by focusing on control of daily living activities which are completely nursing's responsibility. The practitioner could incorporate similarity of routines and ME in assessments and interventions; this could be followed by evaluating the impact of these assessments and interventions anecdotally and in clinical ethnographies.

Finally, this study contributes to the development of the concept of perceived control by identifying dissimilarity of routines and eveningness as potential risk factors contributing to the development of powerlessness or a perceived loss of control. The study does not support the general notion that critical care units promote powerlessness. Further studies of perceived control in clinical situations need to include a measure of patient appraisal of the situation so that the perception of control can be evaluated in terms of the importance the individual gives to the present situation.

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APPENDIX A

Patient Profile

Patient Profile

Code #:_________

Obtained from medical record:
1. Age:___ 2.Gender:___ 3.Insured: Y__ N__ 4.Employed: Y__ N__
5. Primary Diagnosis:____
6. Secondary diagnosis:____

____

7. Day of present hospitalization:______________________________
8. How many days in CCU:______________________________________

Obtained from patient interview:
9. Occupation:_______________10.Partner's Occupation__________
11. How many other times have you been in the hospital?_______
12. Have you ever been in a coronary care unit or other type of critical care or intensive care unit before? _____________

____

13. Were you awakening during the night more frequently than usual for the week before you came to the hospital?

____

14. What is your usual bedtime at home? __________________

15. What is your usual awakening time at home? _____________

16. What has been your sleep-wake cycle for the last week?

____

17. Some people get up early in the morning, feel energetic soon after they get up, and like to go to bed early. Other people prefer to get up later, are most energetic later in the day, and like to stay up late. Do you consider yourself an early person, a late person, or do you have no preference?____

____

18. What do you consider the best time of day for you, that is, the time when you feel the most energetic? _____________

APPENDIX B

Biological Rhythm Assessment Form

Research study: Relationship of Perceived Control and Daily Living Activities in a Coronary Care Unit
Principal Investigator: Janyce Lundstedt, R.N., BSN, CCRN

BIOLOGICAL RHYTHM ASSESSMENT FORM
INSTRUCTIONS FOR CCU BEDSIDE NURSE

1. Begin data collection on admission for any and all patients who meet the study criteria which are the following:

   A. Inclusion criteria:
      1. Alert and oriented
      2. Less than 75 years old
      3. English-speaking
      4. Expected to be in the CCU at least 48 hours
      5. Be in a private room

   B. Exclusion Criteria:
      1. Endotracheal intubation
      2. Cardiac arrest with residual neurological effects
      3. Cardiogenic shock
      4. Presence of intra-aortic balloon pump
      5. Blindness

2. Make a notation on the kardex if you exclude someone from the study. Please include the reason. If a patient is excluded, remove the Biological Rhythm Assessment Form from the clipboard and leave it with the secretary for recycling.

3. If the patient is a potential subject, enter the medical record number and date and time of admission on the Biological Rhythm Assessment Form. The investigator will assign the code number.

4. Please continue data collection until the patient has declined to participate in the study or until the investigator has completed the rest of the data collection. Either case will be noted on the kardex by the investigator, who will remove the Biological Rhythm Assessment Form from the clipboard.

5. The nurse researcher, Janyce Lundstedt, will be in the unit daily to recruit and interview patients; she will be asking the bedside nurse if the timing is appropriate for the patient to be interviewed and if the bedside nurse would ask patients if they would mind talking with the researcher about the study.

6. The researcher will be interviewing patients for the remainder of the data needed for the study. Each interview will take approximately 15 minutes.

7. The researcher will also be available for any questions you may have concerning the study. Home phone: 629-5349.

8. Staff involvement in this study is greatly appreciated! Please do NOT change anything you are presently doing for the patients; this unit has been chosen by the investigator because of the quality nursing care given in this CCU! The researcher will present the results of the study to interested staff following analysis of the data collected.

Research Study: Relationship of Perceived Control and Daily Living
Activities in a Coronary Care Unit
Principal Investigator: Janyce Lundstedt, R.N., BSN, CCRN

BIOLOGICAL RHYTHM ASSESSMENT FORM

MR#__________ CODE #______ ADMISSION DATE:___________ ADMISSION TIME:___________

Measure oral temperature using the thermometer routinely used in the CCU (IVAC Model 2080A) every four hours according to CCU standards. Please continue this through the night. It is not critical that the temperature measurements be done exactly four hours apart. It is critical that the exact time you take the temperature be documented on the Biological Rhythm Assessment Form. It is also important that the thermometer be placed on the right or left sublingual pocket. (NOT under the front of the tongue) because this has been shown to be more accurate especially with this type of thermometer.

			Place a "Y" for yes and an "N" for no in the following: DURING THE LAST HOUR THE PATIENT WAS:		List here any factors that may have inadvertently influenced accuracy of this temperature measurement (e.g. hot or cold drinks, ice chips, mouth care, etc.)
DATE	EXACT TIME	ORAL TEMP	ASLEEP >20"	CONTINUALLY AWAKE	INFLUENCING FACTORS

*Note the use of any antipyretics (date, drug, route, and time) in the space provided below:

ANTIPYRETICS

DATE	DRUG	DOSE	ROUTE	EXACT TIME OF ADMIN.

ANTIPYRETICS

DATE	DRUG	DOSE	ROUTE	EXACT TIME OF ADMIN.

APPENDIX C

Perceived Control Questionnaire

LUNDSTEDT PERCEIVED CONTROL QUESTIONNAIRE

ACTIVITIES	Please give me a number between 0 and 10 that best describes how much control you ***have*** over activities in this unit. A 0 would mean you have "no control" and a 10 would mean you have "complete control".	Please give me a number between 0 and 10 that best describes how much control you ***would like to have*** over activities in this unit. A 0 would mean you would like "no control" and a 10 would mean you would like "complete control".	Please give me a number between 0 and 10 that best describes ***how similar or dissimilar*** these activities in this unit are to your usual routine. A 0 would mean your usual routine is "not at all similar" to the CCU routine and a 10 would mean your usual routine is "very similar" to the CCU routine.
The time you go to sleep at night.	________	________	________
The time you awaken in the morning	________	________	________
When you bathe	________	________	________
When you eat	________	________	________
What you eat	________	________	________

PERCEIVED CONTROL QUESTIONNAIRE—Part Two

Using the same scale, please give me a number indicating how you FEEL about the amount of control you have over your daily living activities in this unit?	A 0 would mean you are "not satisfied at all" with the amount of control and a 10 would mean you are "satisfied".	A 0 would mean you are "not happy at all" with the amount of control and a 10 would mean you are "happy".	A 0 would mean you are "not contented at all" with the amount of control and a 10 would mean you are "contented".	A 0 would mean you are "very frustrated"with the amount of control and a 10 would mean you are "not frustrated at all".
	________	________	________	________

Code #: ________

Date (yy/mm/dd) ________

Time ________

APPENDIX D

Consent Forms

OREGON HEALTH SCIENCES UNIVERSITY
Consent Form

TITLE: Relationship Between Perceived Control and Daily Living Activities in a Coronary Care Unit
PRINCIPAL INVESTIGATOR: Janyce Lundstedt, (503) 629-5349

PURPOSE: The purpose of this research study is to look at your awareness of the control you have over your daily living activities in the coronary care unit. Participation in this study will take about 15 minutes.

PROCEDURES: You will be asked to participate in a brief interview about your usual daily schedule and your schedule in the CCU. The interview will take about 15 minutes. The investigator will copy some information from your medical records.

RISKS AND DISCOMFORTS: The only risk to you is the inconvenience of the 15 minutes it takes to participate.

BENEFITS: There will be no direct benefit to you; however, future coronary care unit patients may benefit from your contribution to this study.

CONFIDENTIALITY: Information you give the investigator will be kept strictly confidential. A code number, rather than your name, will be used on the questionnaire. Neither your name nor your identity will be used for publication or publicity purposes.

COST: There will be no cost to you for participating in this study.

LIABILITY: Because the investigator is a graduate student from Oregon Health Sciences University, the following statement is required. The Oregon Health Sciences University, as an agency of the State, is covered by the State Liability Fund. If you suffer any injury from the research project, compensation would be available to you only if you establish that the injury occurred through the fault of the University, its officers or employees. If you have further questions, please call Dr. Michael Baird at (503) 494-8014.

OTHER: Janyce Lundstedt will answer any questions you might have about this study. She can be reached at (503) 629-5349.

You will receive a copy of this consent form.

I understand that I am free to refuse to participate or to withdraw from participation in this study at any time without effect on my relationship or treatment at St. Vincent Hospital and Medical Center.

I have carefully read and understand the foregoing. I hereby voluntarily consent to my participation in the experimental procedures as described above.

Subject:______________________ Date:______________

Witness:______________________ Date:______________

Investigator:__________________ Date:______________

APPENDIX E

CCU Patient Control Study Protocol

Research Study: Relationship of Perceived Control and Daily
Living Activities in a Coronary care Unit
Principal Investigator: Janyce Lundstedt, R.N., BSN, CCRN

CCU Patient Control Data Collection Protocol

1. Prior to the beginning of the study, the investigator will meet with the nursing staff of the coronary care unit (CCU) to inform them about the study and to give them instructions in the use of the Biological Rhythm Assessment Form. In addition, each cardiologist who admits to the CCU will be asked to give a general consent permitting the investigator to approach his patients about participation in the study.

2. The investigator will bring the Biological Rhythm Assessment Forms and the instructions that accompany each form to the secretary who compiles the admission packets presently being used in the CCU. The investigator will request that a Biological Rhythm Assessment Form be included in each admission packet.

3. When a patient is admitted to the CCU, the admitting nurse or the investigator will use the following criteria to determine if the patient would be appropriate for the CCU Patient Control Study:

A. To be included in the study patients will be:
   1. Alert and oriented
   2. Less than 75 years old
   3. English-speaking
   4. Expected to be in the CCU for at least 48 hours
   5. In a private room

B. Exclusion criteria:
   1. Endotracheal intubation
   2. Cardiac arrest with residual neurological effects
   3. Cardiogenic shock
   4. Presence of intra-aortic balloon pump
   5. Blindness

The admitting nurse or the investigator will make a notation on the patient's Kardex if the patient has been eliminated from the study.

4. If the patient is a potential subject for the study, the admitting nurse or the investigator will place the Biological Rhythm Assessment Form on the patient's clipboard where it will remain throughout data collection.

5. On admission, the staff nurse will begin data collection on the Biological Rhythm Assessment Form for all patients who are potential candidates for the study. The staff nurse will measure oral temperatures with the IVAC Model #2080A using the right or left sublingual pockets. The staff nurse will document all temperatures, date, and exact time taken along with factors that may have influenced the accuracy of the temperature, such as, recent (within 20 minutes) hot or cold drinks, ice chips, meals, mouth care, sleep, and antipyretics (date, name, dose, time, and route).

6. Each day the investigator will approach potential subjects about the study only after the bedside nurse deems the timing appropriate medically and asks the patient if he or she would be interested in discussing participation in the study with the investigator. The study will be briefly described by the investigator and the patient will be given sufficient time to read the consent form and decide about participation. Once a subject is admitted into the study the investigator will give the patient a code number for the study. Only the investigator will know the code numbers. The investigator will not have access to a patient's medical record until the patient has consented to participate in the study.

7. The staff nurse will continue data collection until the patient has refused participation in the study or the investigator has completed data collection. Once either one of these conditions has been met, it will be noted on the patient's Kardex by the investigator. Data collected on any patient who is eliminated from the study or who declines to participate in the study will be destroyed by the investigator.

8. Each day the investigator will be present in the unit to recruit patients for the study, administer questionnaires, complete profiles, evaluate data collection, and address any problems the nursing staff may be having with the study. The investigator will visit the unit periodically on all three shifts to facilitate reliable use of the Biological Rhythm Assessment Form. The investigator is available at the following phone number: (503) 629-5349.

9. The investigator will administer the Perceived Control Questionnaire at least 48 hours after admission to the CCU and before discharge or transfer out of the CCU. Patients will be asked to answer four questions evaluating five daily living activities using a verbal rating scale. The researcher will read each question to the subject who will be given as much time as necessary to respond.

ABSTRACT

Title: Relationship of Perceived Control and Daily Living Activities in a CCU.
Author: Janyce Lundstedt
Approved by: ______________________________
Linda Felver, Ph.D., R.N., Advisor

Multiple factors influence the loss of control patients feel as a result of a sudden, unplanned admission to a critical care unit. The purpose of this study was to identify the contribution of daily living activities to the perception of loss of control for patients in the CCU.

The study sample was 17 CCU patients (11 males and 6 females, ages 42-75) from a 420-bed medical center in the northwest United States. Body temperature measurements were collected on a Biological Rhythm Assessment Form by the CCU nursing staff as part of their usual clinical assessment and were used to assess the stability of the patients' body temperature rhythms. After the patients had been in the CCU for 48 hours, the investigator administered a Patient Control Questionnaire (PCQ) and Patient Profile (PP) in a short interview. The PCQ uses verbal numerical rating scales to ask subjects how much control they have over their daily living activities in the CCU, how much control they would like, how similar the CCU routines are to their usual routines, and how they feel about the amount of control they have. The PP includes demographics and questions that classify subjects as morning or evening people.

The results showed the following: (a) Perceived control over daily living activities in the CCU was correlated with similarity of CCU routines to the patients'

usual routines ($r=0.47$; $p=0.058$). (b) Morning subjects reported CCU sleep-wake routines as similar to their usual sleep-wake routines ($p<0.01$, one-tailed t-test), while evening subjects did not report CCU sleep-wake routines as similar to their usual sleep-wake routines. (c) Desired amounts of control of daily living activities in the CCU were not associated with positive feelings about control ($r=0.13$; $p=0.67$), but perceived control scores were significantly associated with positive feeling scores ($r=0.55$; $p=0.03$). (d) The two subjects (11% of the sample) whose body temperature rhythms had peaks in the expected interval for healthy adults by cosinor analysis reported that CCU routines were similar to their usual sleep-wake routines. (e) Of the six subjects (53% of the sample) whose body temperature rhythms had peaks in the expected interval by visual analysis, 83% reported that CCU routines were similar to their usual daily sleep-wake routines.

This study contributes to nursing research by developing a measurement tool with potential clinical use; to nursing practice by supporting the inclusion of morningness-eveningness and similarity of hospital routines to patients' usual routines in assessments and interventions; and to nursing concept development by examining the perception of control in a CCU.