

ON THE STRUCTURE OF TIME WITH IMPLICATIONS FOR NURSING

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*The child lives in the minute
The boy in the day
The instinctive man in the year
The man imbued with history lives
in the epoch
The true philosopher lives in eternity.*
Bertrand Russell

ON THE STRUCTURE OF TIME

Introduction

The importance of a person's time structure has barely been explored in nursing. Since periodicity has increasingly been recognized as an important variable in a person's functioning, studies on biorhythms have received greater emphasis in recent years^{1, 2}. But these rhythms do not seem to provide any useful explanation of time experience. The judgment of the passage of time, the subjective importance of differences in emphasis on time among people has hardly been investigated. Like all physiological responses, time judgment must also depend on metabolic reactions. It stands to reason that any condition which affects the metabolic rate and influences perception will alter the subjective estimation of time. The judgment of time passage is a learned skill and is influenced by the qualitative and quantitative aspects of the individual's environmental experiences as well as by the subjective interpretation of the perceived events. To individualize nursing interventions, an effort needs to be made to develop objective measurements for monitoring a patient's progression and eliciting predictable responses. The time structure and the effect it has on a person's behaviour and functioning in a given environment needs to receive greater attention in nursing.

A. The Development of a "Sense of Time"

The concept of time, as far as we can know, is unique to man. An animal may remember past events but the concept of a "past" and even less of a "future" is outside of its experiential knowledge. It follows that a non-human creature experiences only the present and cannot conceive the inevitability of its own death. Probably this realization of finitude, rather than the discovery of fire, separated man from the rest of creation and directed the destiny of civilization. A person's view of life and

perspective of the world, the preferences and values to which he adheres, are essentially a view of time. Primitive man with his magical thinking, lived in a continual "now", the way a child experiences time. His life centered around the seasons, the daily fluctuations of light and darkness and the necessity to provide for his basic needs. Through civilization man learned to look with verifying eyes at both time and space and to create his world through language, history and art³.

The development of the ability to experience and to estimate time occurs gradually as the child matures. Waiting periods between feedings are the culturally determined time-setters and make the infant consciously aware of the flow of time. Although controversy exists on what cues are the most consistently integrated time-setters, there is general agreement that the time sense increases with diminishing egocentricity. A sense of the duration of time is not developed until after the age of five or six years and continues to develop through the 13th and 14th year. This abstract concept of time duration, characteristic of technological societies where goods cost time or money, seems to be absent in many other cultures. Thus the relationship of personal experience of events to conventional units of time is learned and depends upon the cultural setting from which a person originates⁴. "People of the Western world, particularly Americans, tend to think of time as something fixed in nature, something around us and from which we cannot escape..."⁵.

All our intellectual, emotional and perceptual experiences are interwoven with time, and we are usually aware of the continuous passage of time. Thus, although we experience time, "we cannot taste it, see it, smell it, hear it or touch it"⁵ and no time organ has been identified, although we speak of a "sense of time". Some biologists and physiologists have postulated a sort of "time base", that is, a repetitive cumulative pulse dispensing mechanism termed the "biological clock".

To date, no "master-clock", capable of synchronizing all internal, periodic, physiological processes and shorter biological rhythms has been identified. Various experiments have established a correlation between different physiological cycles and time estimation; but in terms of the subjective meaning of time duration, this correlation cannot be made, as "real" time for an individual cannot be equated with the clock time of minutes and seconds⁵. Our clock is but one arbitrary means of defining time.

The literature on time perception centres on two opposing views. One view claims a linear and positive relationship among the presented stimuli⁵. It states that with increased stimulus complexity, estimation of the duration of time increases. The opposing view shows a negative association between the experiential complexity which fills a given interval and assessment of time duration. As a result, a shortened time period is experienced with increased stimulus complexity⁶.

Opposing both views is the common sense observation that the more actively we process environmental stimuli, the more swiftly time seems to pass, while, conversely, time seems to progress more slowly the less actively we experience given stimuli.

Although the twenty-four hour day is our most important social time unit, "real" time does not conform to seconds, minutes and hours and does not progress at a uniform speed. Einstein, when asked about the paradox of the subjective time experience, answered that time is "relative". Whenever he was sitting with a young girl in his arm in an amorous mood, hours flew like minutes, whereas sitting inadvertently on a hot stove, minutes felt like hours. Both views can be reconciled by the hypothesis that time perception is not a linear but rather a U-shaped function of both personality and stimulus complexity⁷.

B. Illness and the Aspect of Time

In recent decades among industrialized nations, we have ignored our biologic vulnerability to geophysical influences, and have come to expect from our bodies the consistent performance of a machine. Whether we are compelled to adhere to strict time tables or whether we exert all efforts to escape from them, the basic need is the same. We cannot do without positions that are fixed in space and repetitive in sequence. During illness, hospitalization or sudden life-threatening events, the usual concept of time undergoes a major shift in orientation. As a result, values change drastically and the focus is narrowed to immediate priorities.

A discrepancy is apparent between the patient concerned with his present status and the staff who fail to take the patient's time orientation into consideration and are more concerned with future health goals; hence, the patient may feel his concerns and problems minimized or negated by the members of the health team. Because of the shift in emphasis of orientation from a future to a present time basis, and the resultant change in values and goals, people who lose track of time often experience panic and disorientation.

Fogel proposes a hypothesis for studying the whole patient. In it, man is defined basically as a total concept of self in relation to the environment⁸. The components of Fogel's "Total-Self" are body image, environment image and the time concept. Any changes in one component alter the whole organism and have to be considered. Studies of psychiatric patients and experimentation with psychomimetic drugs have documented many uncanny temporal experiences (eg., the experience of timelessness, coincidence, déjà vu, precognition)⁹, with accompanying alterations in behaviour, supporting the view that the orientation to time is necessary for a person to function coherently.

Assessment of time distortion has been found as an easily administered test of clinical significance when monitoring patients following some drugs induced psychosis¹⁰. Physical factors related to the illness seem to be the most important aspects in psychological adjustment. It has been suggested that mild intellectual impairments are associated with a better adaptation and prolonged survival time in illness. These mildly impaired patients possibly experience a diminution of interests and concerns and an altered time sense, all of which help to reduce their anxiety and despair over future difficulties¹¹.

Here a patient's flight into a different time frame as a survival and coping mechanism may be interpreted as therapeutic. Whether the patient experiences the present as valueless, feels a sense of liberation in escaping the rigidity of time schedules, or becomes confused as environmental cues conflict with his subjective experience, the importance of a person's time structure needs further investigation.

There can be little disagreement that failing physical power and the loss of mobility have a profound effect on individual experience, including the person's experience of his time¹². However, whether this alteration of human structure and consequent variation in time perception universally occur in disease have not been answered in previous studies.

C. Time as Adjunct to Tailoring Nursing Actions

In nursing, concerned as it is with the care of people, we try to individualize the therapeutic relationship and find ourselves puzzled that often our best efforts are not appreciated as such by the clientele we serve. Increasingly, we hear about the "quality of care" and about the consumer's concern regarding the cost of health care delivery. The assessment of the quality of nursing care has been recognized as a critical problem in the profession for a long time. What is under dispute is the definition of the components of the "quality of care". Basically, no two people see eye to eye on this topic. There has been a tendency to treat all variables as though they were equally important although, at the present stage of knowledge, there is no universal criterion that fit all situations and all frames of reference. Relevant and unbiased criterion variables which can be used in the care of patients are not available. A valid evaluation of patient care, and subsequent nursing intervention, must take into account the person's time perception. It is with this view on how the patient experiences nursing care, and what may sway his evaluation, that time perception becomes an issue.

Of all cultures, that of the present-day Western world is most frantically time-conscious. This hardly seems a coincidence. Yet, one of the most overlooked dimensions in human interactions is the aspect of time. This applies to ingrained views regarding our daily habits or, more importantly, to the way we treat people who are sick³.

The idea that there could be such a thing as temporal vulnerability may sound speculative, due mainly to our lack of knowledge and research in human timing¹². However, once it is possible to obtain data comprehensive enough to understand a person's time structure, it may become possible for nurses to individualize their interventions. A preschool child has visions that an event will take place within the next few minutes when told it will be "soon". A teenager may interpret the same time frame, depending upon the circumstances, to mean hours or days. An old person may think in terms of weeks. In the nursing assessment, we ask patients about the expectations they hold regarding their hospitalization and illness. We identify the discrepancy between the reality of the situation and the patient's view, but have not tuned in to the importance of a patient's time frame. This is particularly relevant when interacting with different cultural groups or people for whom time is of no particular economic importance. In cultures where time is a process reflecting the seasons, man is part of that change. Considering transience to be part of the universe, mortality is not perceived as a threat to the ego, as it is in Western societies. Thus, the cultural concepts of time have a prominent influence on individuals and on major social developments, such as health care delivery.

Increasingly, nursing has to identify the variables which the nurse can influence, and how these factors can be utilized to measure the effectiveness of nursing actions. Quality of nursing care is, however, a multidimensional entity which cannot be evaluated by a single overall index. This aspect of the criteria for quality and the apparent independence of these dimensions make a total score for quality meaningless¹³. Before an evaluation of patient outcomes can be undertaken, relevant criterion variables must be identified and methods of appraising these variables developed. One major group of variables manipulated by the nurse is that of behaviour. Even when seemingly simple modification of patient behaviour occurs, methods which allow accurate prediction of the given intervention may be lacking.

The importance of physiological cycles has been recognized within the past decade. Periodicity is a common phenomenon in nature. The diurnal rhythms which humans develop and maintain evolve from being born into, and living in, a family and community oriented to alterations of light and darkness which in turn, result from the period of rotation of the earth around its axis¹⁴. Our distant forebears observed the seasons and used a readily available model for time, namely the moon, with its observable, regular and recurring cycles. Within our era of Western industrialized society, the prevailing perception tends to see man no longer as part of nature, but as a machine facilitated by our own artificial sun, electricity. These normal physiological cycles are disrupted by various

changes in a person's condition such as illness, prolonged immobilization, or drug therapy. Under such circumstances, persons are less able to accurately judge the passage of time and will often exhibit related behavioural aberrations. The occurrence of disorderly events will be found at the psychological level of behaviour as well¹⁴. Conversely, some patient-care environments, immobility, and unaccustomed daily schedules with nothing to do may be adding stress to a person's already precarious adaptation to his illness¹⁵. That a change in one physiological parameter affects the whole organism is recognized, but rarely is this utilized to gauge nursing intervention. For example, an elevation in body temperature changes subjective time perception¹⁶, but nursing care which does not capitalize on this information may unwittingly add to the stress imposed by illness.

For the Western mind, time is such a common attribute of all natural phenomena, that its consideration is generally assumed to be self-evident. By observing the changes in the environment we learn about the estimation of the duration and sequence of events. The individual has the ability to quantitatively estimate the duration of perceived events and to remember their temporal sequence. Both the degree of distortion of this ability and the importance of the experience of time to an individual as he moves along the well-sick continuum in either direction are largely nebulous at this point. In one study, temporal orientation was found to be inversely related with the level of education and of clinical significance¹⁷. However, most of our textbooks do not indicate that the time structure is sensitive to socio-economic variables. Although changes in time perception have been alluded to in the aged¹⁸, the assessment of orientation to time has been presented as uniformly significant.

The nurse as mediator between the patient and his environment can assume a pivotal role by monitoring psychomotor performance in addition to the usual vital signs. One easily introduced method for determining discrepancies could be to ask the patient to estimate the duration of one minute and compare the result with objective or clock time.

Although it is a truism that a nurse cannot practice beyond the boundaries of her vision, nursing is as broad as life, since it deals with people and hence necessitates sensitivity to the time and place when intervention will be most constructive. Recognition of individual differences in time structure and the diverse circumstances which affect it is but one of the many variables warranting consideration in the care of people¹⁹.

REFERENCES

1. O'Dell, Margaret L. "Human Biorhythmology Implications for Nursing Practice", *Nursing Forum* XIV:1: 43-47, 1975.
2. Millar-Craig, M.W. et al. "Circadian Variation of Blood Pressure", *Lancet*, 1:8068: 797-798, April 15, 1978.
3. Ornstein, R.E. "On the Experience of Time", Harmondworth, England: Penguin Books Ltd., 1969.
4. Luce, Gay G. "Body Time", New York: Random House, 1971.
5. Hall, Edward T. "The Silent Language", Greenwich, Conn.: Fawcett Publications, Inc. 1959.
6. Priesly, J.B. "Man and Time", New York: Dell, 1968.
7. Hogan, W.H. "A Theoretical Reconciliation of Competing Views of Time Perception", *American Journal of Psychology*, 91:3: 417-428, 1978.
8. Fogel, Sidney. "Muscular Spasm Diseases and Body Image Distortions", *The American Journal of Clinical Hypnosis*, 14:1: 16-23, 1971.
9. Wallace, Melbin and Albert, I. Rabin. "Temporal Experience", *Psychological Bulletin*, 57:3: 213-236, 1960.
10. Yesavage, J.A., A.M. Freeman, and M.L. Bourgeois. "Time Distortion in Acute Phencyclidine (CPC) Psychosis", *L'Encephale*, 4:3: 281-285, 1978.
11. Davies, Robert K. et al. "Organic Factors and Psychological Adjustment in Advanced Cancer Patients", *Psychosomatic Medicine*, 35:6: 464-471, 1973.
12. Stephens, Gwen J. "Time Factor, Should It Control the Patient's Care", *American Journal of Nursing*, 65: 77-82, 1965.
13. Hagen, Elizabeth. "Appraising the Quality of Nursing Care", *American Nurses Association Eighth Nursing Research Conference*, 1-8, March 15-17, 1972.
14. Kleitman, Nathaniel. "Sleep and Wakefulness", Chicago: University of Chicago Press, 1939.
15. Stephens, Gwen J. and Franz Halberg. "Human Time Estimation", *Nursing Research*, 14: 310-317, 1965.
16. Hoagland, H. "The Physiological Control of Judgment of Duration: Evidence for a Chemical Clock", *Journal of General Psychology*, 9: 267-287, 1933.
17. Natelson, B.H. et al. "Temporal Orientation and Education", *Archives of Neurology*, 36: 444-446, 1979.
18. Sorenson, K.C. and J. Luckmann. "Basic Nursing: A Psychophysiologic Approach", Toronto: W.B. Saunders Co., 1979, p. 1233.
19. Levy, Sandra, M. "Temporal Experience in The Aged: Body Integrity and Social Milieu", *International Journal of Aging and Human Development*, 9:4: 313-344, 1978-79.