1405

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR EUROPE

WELTGESUNDHEITSORGANISATION
REGIONALBÜRO FÜR EUROPA

ORGANISATION MONDIALE DE LA SANTÉ
BUREAU RÉGIONAL DE L'EUROPE

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ
ЕВРОПЕЙСКОЕ РЕГИОНАЛЬНОЕ БЮРО

CONSULTATION ON METHODS OF ASSESSMENT OF PSYCHOLOGICAL FACTORS RELATED TO HYPERTENSION CONTROL

Moscow, USSR
20-22 November 1984

ICP/NCD 001/m13/5
ENGLISH ONLY
UNEDITED

CONTENTS

1. Introduction

The participants of the meeting of a WHO Scientific Group on Consultation on Methods of Assessment of Psychosocial Factors related to Hypertension Control were welcomed by Dr I. Glasunov, Head, Division of Preventive Programmes, Institute of Preventive Cardiology, Moscow.

On behalf of the World Health Organization the meeting was opened by Dr V. Zaitsev, Regional Officer for Chronic Diseases. He referred to the Health Care Related Hypertension Research Action Programme (HYRAP). This programme is aimed mainly at the standardization of health care related research methods and the promotion and coordination of health care related research projects, especially in primary prevention of this disease.

A great deal of the activities within HYRAP concerns psychosocial issues of essential arterial hypertension. They cover:

a) psychosocial factors associated with the etiology, pathogenesis and control of hypertension;

b) methods of assessment of those factors;

c) cost-effective and feasible behavioural and psychotherapeutical intervention techniques which can be included into multidimensional programmes for prevention and control of hypertension and

d) psychosocial issues of compliance in hypertension control.

2. Scope and Purpose

Methods for gathering information on hypertension related psychosocial factors are developed on various theoretical traditions and conceptual backgrounds. There is a great diversity of methods applied for personality traits, reaction patterns, coping strategies and other individual environmental conditions, job factors, and life events. Methods applied even within one country and language area vary. The diversity of techniques in international contexts is much greater and only a few methods have been internationally standardized. This unsatisfactory situation is widely recognized, and there is considerable interest among the scientists in the field for standardization of methods. WHO should play a more active coordinating role in such international efforts.

The purpose of the meeting is to critically review currently applied methods on psychosocial factors related to hypertension. On this basis,

a) recommendations will be given for practical applications of those methods which have shown sufficient validity, feasibility, and cost-effectiveness;

b) recommendations will be given for research for the further development of methods and for their standardization.

In both contexts the role of WHO will also be discussed.

3. Review of previous HYRAP meetings

3.1 At the WHO meeting held in Maastricht in May 1984 on psychosocial factors related to hypertension control, a number of issues emerged as salient to this meeting:

a) A number of psychosocial factors, such as hostility, neuroticism and locus of control, were seen as worthy of research at the individual level.

b) However, there was a clear need to clarify the conceptual framework of these individual variables, distinguishing between states and traits and to pay attention to the psychometrics of their measurement.

c) Type A behaviour was seen to be possibly an important factor in the control of hypertension (rather than its etiology).

d) The measurement of life events was best concentrated upon their perception.

e) Interview techniques could be useful in the measurement of life events as possible pathogenic factors in hypertension. However the methods had to be shortened and their psychometric characteristics had to be improved.

f) The interval between tertiary and life events (when measured by scales) should not be longer than one year.

g) Socioeconomic status, education and social mobility are relevant factors especially for hypertension control studies.

h) Family histories must be treated cautiously as data since patients are frequently unaware of them.

i) At the microsocial level it was agreed that social support and social network were important variables in buffering life events.

j) Job characteristics were seen as important as possible influences on the development of hypertension; relationships at work, job demands, work loads, all were worthy of study.

k) Certain other macrosocial variables were also seen to be worthy of study, such as organizational and industrial structures.

3.2 At the WHO meeting held in Kaunas in June 1984 on compliance and hypertension control, a number of points relevant to this meeting emerged:

a) Compliance is a term which involves the behaviour of the patient, of the doctor and other health-care providers and the community.

b) Studies have shown that patients sometimes completely fail to understand the doctor's instructions so that doctors should be careful to make sure that patients can understand what they have said.

c) Compliance is a complete concept implying involvement and active participation by the patient and by his community, e.g., the impact of press-campaigns about smoking. Patients must be encouraged and allowed to take responsibility for their own well-being.

d) Compliance can be understood only within its social context since all depends upon the attitudes to doctors and health within a particular community.

4. Psychometric aspects

4.1 The assessment of psychosocial factors requires adequate measures and the first topic of discussions concerned what constituted a good psychometric test.

a) Tests must be reliable. The term reliable has two separate meanings. The first pertains to its stability over time. A test if given to an individual on more than one occasion, unless that person has changed, should yield the same score each time. Test-retest reliability is measured by the correlation coefficient and suffice to say that a reliable test should have a reliability greater than .7. This is a minimum and many have reliabilities well beyond this figure.

The second meaning of reliability concerns the consistency of the test. Many psychological tests are comprised of a large number of items. It makes sense to anyone that each part of a test should be measuring the same variable hence the demand for high internal consistency. Again the minimum figure is .7.

b) Tests must be valid. A test is said to be valid if it measures what it claims to measure. Clearly, then, validity is a critical characteristic for a satisfactory test. Indeed, as we hope our discussion of reliability made clear, the importance of reliability turns upon its relation to validity. Almost without exception if a test is not reliable it cannot be valid.

How, then, can validity be measured? Unfortunately, unlike reliability, no single validity coefficient can be meaningfully produced. As regards the measurement of psychological factors associated with hypertension, it is construct validity that is the key concept. To demonstrate

construct validity, a set of hypotheses about the test variable is proposed and subjected to empirical verification. Thus, if we had, for example, a type A measure, we would correlate it with other type A measures: there should be positive correlations. This is concurrent validity, an aspect of construct validity. We could predict that a greater proportion of high scorers would require treatment for heart ailments than controls or low scorers. This is predictive validity, another aspect of construct validity. To some extent, therefore, construct validity is a matter of judgement - do the results support the construct or not?

Problems with Personality Inventories. Although personality inventories are usually psychometrically superior to other types of personality test, we need to be aware of certain problems which can lower their validity, although if the norms are appropriate and the evidence for validity satisfactory, it can be argued that these problems are trivial. We refer to response sets. The two most pervasive are social desirability, the tendency to respond to an item in the socially desirable fashion, a feature which can make cross-cultural testing and comparison difficult, and acquiescence the tendency to respond to items in the affirmative, regardless of content. Again, this can affect cross-cultural testing since test-naive groups may be more affected by acquiescence than Western samples. However, the answer to these difficulties is empirical: if a test has good evidence for validity with the intended population, response sets may be ignored.

A final problem resides in deliberate falsification of responses. All that can be said here is that good rapport between tester and subjects, the genuine promise of complete confidentiality, and the clear statement that no consequences to a subject's career or education will occur, all minimize this difficulty.

Cross-Cultural Testing. For a world-wide investigation of the kind which we are discussing, cross-cultural testing is a sine qua non. Now there are considerable problems in the cross-cultural testing of personality and in the cross-cultural use of personality questionnaires. However, these can be overcome and we shall now briefly mention the problems and suggest their remedies.

a) Translation of items. Back-translation is usually used in which a translation is translated back into the original and the two are then compared. This ensures a proper use of idiom. Translation is essential especially when working in countries with relatively undeveloped educational systems.

b) Suitability of items in new cultures. Of course items can be translated but be psychologically meaningless in a culture different from that where the test was developed. For example, an item about smoking used in a study in North India. Since the sample was half Sikh, for whom smoking is forbidden by religion, there were obvious problems. The solution to this profound difficulty lies in the third point

c) Evidence for the validity of the test in the new culture is required

This evidence is obtained in three ways:

i) Item analyses - the items should have the same correlations with the total score (within reason) in each culture. If there are real differences in mean score between cultures, the proportions putting the keyed responses in each culture could not be the same.

ii) Factor analyses of items. The items should have the same factor loadings in all cultures. Any items that fail to meet the criteria in (i) and (ii) should be rejected. Two courses are then possible; either new items for each culture can be written equivalent to the rejected items of the original, or else shortened scales of items working in all cultures can be used. Which is the better design depends upon the particular results. If few items are universal extra items will be required.

iii) Correlations with the scales. Correlations of external criteria and other tests with the scale under consideration should be the same in all cultures. This ensures that the factor on which the items load is culturally comparable. When this is shown, the scale may be regarded as suitable for cross-cultural use. When all these points are met, psychometric assessment of psychological factors across cultures becomes possible.

Conclusions

We have described the psychometric characteristics of adequate tests, the demands of high reliability, evidence of validity and good standarization. In addition we have outlined the psychometric necessities of cross-cultural testing, necessities which are all important in the

context of international studies. When as researchers into the determinants of hypertension it becomes necessary to use personality tests or indeed other types of psychosocial tests then it is these points that must be borne in mind.

4.2 Projective tests, rating scales and self-report inventories in relation to hypertension

Projective Tests

There is no single projective study that clearly links high blood pressure with a specific personality pattern. In fact, the only strong evidence is of a completely negative nature. Problems arise because projective tests are difficult to administer and score, and require a skilled interpreter. Yet neither the Rosenzweig P.F., the Rorschach, and the Draw-a-person-test has failed to yield evidence that a "hypertensive personality" exists.

A common feature of projective techniques is that they offer the subject ambiguous and unstructured stimulus materials, upon which he imposes his own structure. Although projective tests may offer a rich source of information to the clinician, their lack of objectivity in scoring, inadequate standardization, and questionnable validity cause problems for the experimentalists (Singer, 1968).

Much of the (early) research has been done with vaguely described experimental groups and faulty controls. It is our impression that even the better controlled studies did not reveal a different behaviour pattern between hypertensives and normotensives. However, an objective technique of scoring projective tests has shown itself to be useful (Kline, 1979).

Rating scales

Some investigators have developed rating scales by which they judge the personality characteristics of their subjects. Since each experimenter has developed a scale for his own purposes, not much is known about the validity of these scales, nor are norms available. In using any scale to judge the behaviour of others, it is essential that the behaviour being observed be clearly defined ahead of time and that a significant degree of reliability exist between ratings made independently by different observers.

Self-report inventories

Basically all these paper and pencil inventories consist of a variety of statement about actions and feelings, to which an individual responds by indicating whether or not these are characteristic of him. Because they are based on self-assessment, the tests are subject to such factors as an individual's memory, intelligence, motivational state, etc. All these can be sources of error.

5. Personality variables: Traits, attitudes and beliefs

Research on the relationship between psychosocial variables and hypertension has been intensively pursued for over 30 years. Reviews of the literature revealed that questions can be put on validity and reliability of most of the studies. Despite many subjective and impressionistic reports to the contrary, no consistent and agreed-upon "hypertensive personality type" has been identified in this work (Syme, 1979).

The question whether a "hypertensive personality" exists, mainly characterized by the suppression of hostility (Alexander 1939), has been an important theme. Even when the first psycho-analytical and highly subjective descriptions were replaced by predefined instruments for measurement, the differences in nomenclature precluded comparison. In addition to the research into evidence for this "repressed-hostility hypotheses", the relation with various psychological factors and traits has been explored, e.g. anxiety, agitation, restlessness, obsessive and compulsive behaviour. These factors and traits were often placed under the denominator "neuroticism". The correlation between high neuroticism score and high blood pressure has been shown several times in clinical studies (Drunkenmölle 1976). Other researchers have not been able to demonstrate this in epidemiological studies (Cochrane 1973, Kornitzer 1983).

Other psychological and behaviour traits that have been investigated in relation with hypertension are for example: internal versus external locus of control, (Wennerholm and Zarle 1976), the degree of assertiveness and social anxiety (Keane 1982, Linden 1981, Svensson 1983).

Psychological characteristics of hypertensives might be either a cause or a consequence of their disorder. Patients who suffer from sustained hypertension mostly have peripheral arteriolar hypertrophy which is the result of a long lasting process. Personality or environmental factors which were involved in the beginning of this process may be absent when a person became a patient.

The assessment of psychosocial variables can be very important for researchers and clinicians who want to design more effective treatments for their hypertensive patient or to make better treatment indications. Since research findings suggest that there is a great diversity of personalities, life styles and life change histories among individuals with essential hypertension, the potential for finding a measurable subject-by-treatment interaction appears promising (Egan 1983).

Health behaviour also depends upon an individual's attitudes and beliefs. So, attitudes and beliefs via unhealthy life style and its somatic consequences may be one of the variables influencing blood pressure elevation and vice versa: changes of attitudes and life style towards health behaviour may have some effect lowering blood pressure (Gostautas, 1984).

The psychosomatic approach, in which psychological and biological factors are studied in their interrelationship, should be advocated (or promoted).

A biobehavioural assessment paradigm could include the following (Weiss, 1984):

1. demographic variables and life circumstances, life events, etc.

2. individual characteristics including cognitive measures as well as personality assessment which would focus upon hostility, anger-in/anger-out, anxiety, depression, coping, in addition to attitudes, beliefs and to health behaviour such as physical activity, smoking, dietary patterns, etc.

3. psychophysiological stress profile which would include (in addition to the traditional "resting state" measures) laboratory studies of cardiovascular, neuroendocrine and lipid metabolism responsivity to physical and psychological stressors under various "challenge" conditions, plus "real-life" ambulatory monitoring of cardiovascular parameters over a 12 or 24 hour period of usual daily activities.

6. Life events

6.1 While there is some evidence for stressful life events preceeding the diagnosis of hypertension, the results are equivocal (Osti, 1980; Shapiro, 1979). Myers (1981) has formulated a model which views life changes as constituting conditional stressors that enhance general susceptibility to disease; high "life stress" along with a subjective appraisal of feeling stressed, would contribute to the appearance or the maintenance of high blood pressure.

Few studies have been concerned with the role of life events in hypertension. An increased prevalence of a transient hypertension has been reported by Ruskin (1948) after life threatening environmental events (Texas city disaster) and by Graham (1945) in soldiers during combat conditions. Kasl and Cobb (1980) have shown an elevation of blood pressure during periods of job loss and unemployment. It is not known whether stressful life events occur more often than expected among hypertensives. A special problem in this regard is the time of onset of the condition of hypertension for this is often unknown.

6.2 Life events scales. The Holme-Rahe technique of measuring life change units utilizes standard weights for each event and is suited for large scale studies. The main difficulty is that a particular event may be perceived differently by different subjects. A number of modifications have been proposed which do take into account the individual perception of events (Rahe 1974).

A different approach is the method of Brown (1974) and the short form of Paykell which focuses on the social context of an event. This interview-method can be very helpful in a small sample study and/or in the clinical setting.

Dohrenwend and Dohrenwend (1974) have summarized a number of dimensions relevant to the study of life event such as intensity, duration, frequency, (un)predictability and (un)controllability as perceived by the individual. In recent years there has been a growing conviction that beliefs about personal control are implicated in stress and coping. Yet how these beliefs influence stress and coping is not clear. In early research it was assumed that believing one has control over

aversive outcomes is stress-reducing and believing that one has little or no control over them is stress inducing. It turned out to be not so simple. Believing that an event is controllable does not always lead to a reduction in stress and believing that an event is uncontrollable does not always lead to an increase in stress.

7. Locus of control

Evidence suggests that locus of control acts as a mediator influencing the relation between life stressors and impairment of mental and physical well-being (see Parkes, 1984). It seems that external locus of control subjects show a stronger positive relation between measures of life events and symptomatology and feelings of distress than do internals. Kobasa (1982) suggested that this finding can be explained by the fact that they use particular types of coping strategies, specifically more task-centered behaviour and fewer emotion-centered behaviours. Locus of control has also been found to influence the coping strategies used to manage everyday problems and tensions (Tanck, 1979).

So the concept of locus of control may be relevant in studying the etiology of hypertension and can also be used in hypertension-control studies. However, we must keep in mind that the concept is very broad, multifactorial and unsatisfactorily defined and operationalized. That is reflected also in the several scales which are available to measure this concept, which have only moderate intercorrelations.

8. Coping

8.1 Appraisal, coping and hypertension

There are indications that hypertension is more prevalent in some occupational groups such as air traffic controllers (Cobb, 1973), telephone operators (Myasnikov, in Kagan, 1974), bus and tramdrivers (Holme, 1977) and prison personnel (Kalimo, 1980). These studies suggest that the blood pressure of those who have to work under permanent (mental) stress might be elevated. It is possible that jobs which require permanent mental load or overload influence the blood pressure. Hypertensives are often described as people who feel threatened most of the time and that they are on their guard for unexpected and unpleasant events (Graham, 1972). This observation is in accordance with the finding of Obrist (1976, 1979). He concludes that adrenergic influences (increased cardiac output and higher systolic blood pressure) are more evoked or more sustained, when subjects actively attempt to cope with the stressor, or when they believe they can cope with a stressor.

The domain of effort-dependent coping activity cited by Obrist (1976) would subsume many of the components of the type A behaviour pattern. Studies of Shekelle (1976) and Rosenman (1966) provided only limited support for the hypothesis that type A patterns will be associated with elevated blood pressure, whereas Manuck (1978), Howard (1976), Scherwitz (1978), Dembroski (1978) reported findings more favourable to this hypothesis. Types A have a predisposition towards excessive cardiovascular reactivity during stress. However, it is not sure that this excessive cardiovascular reactivity is an important etiological factor for essential hypertension.

In a follow-up study of air traffic controllers, Jenkins (1984) showed that persons who remained normotensive reported the greatest amount of life change stress. Prevalence cases of hypertension reported the lowest life change distress and future cases reported intermediate level. In another prospective study of Jenkins (1983) he showed that elevated scores on the Reeder Stress Scale are associated with a lower increase of blood pressure over time. These unexpected findings are to some extent corroborated by an experimental social psychological study by Linden and Feuerstein (1983) in which they found that hypertensives perceive less stress in role-play situations. These data suggest that acknowledgement of stress and distress may be a protective factor against increasing blood pressure.

Weiner, Singer and Reiser (1962) reported that hypertensives tended to defend themselves against a potentially emotional clinical interview by insulating themselves, that is, by becoming detached or uninvolved. From research by Zimmerman (1979) and Minsky (1978) it appeared that hypertensives use more "passive" coping strategies in varying situations, whereas normotensives use more "active" strategies. Handkins and Munz (1978) showed that people with essential hypertension systematically perceive certain situation differently from normotensives. Situations considered by normotensives as stress-inducing (at issue were problematic interpersonal relations), were not observed and assessed as such by hypertensives, in other words, they denied the threatening nature of the situation.

This was also the case in the experiment of Sapira (1971). So, there is evidence that hypertensives may misperceive or deny the aversive qualities inherent in threatening and "potentially hostile" interpersonal encounters: "a defensive style that may promote submissive, deferential and inhibited behaviour in hypertensives by permitting a more benign appraisal of situation typically calling for assertive responding" (Manuck 1984).

The description from Julius and Cottier (1983) of the personality of people with borderline or mild hypertension comes very close to these observations. They characterized hypertensives by submissiveness to other people's views, by a motivation for contact with other people by an attempt to control behaviour so as to be socially acceptable and by difficulties in expressing hostile feelings.

Miller (1980) and Miller and Dworkin (1977) speculated that essential hypertension may develop when elevations in blood pressure serve as coping responses. Miller suggested that individuals who are unable to manage stress psychologically may learn to cope physiologically; that is by elevating blood pressure so as to produce the sedative like effects that accompany baroreceptor stimulation. These elevations in blood pressure would then continue to occur in stressful situation because they are reinforced by immediate reductions in stress emotions. However, over the long run they could be expected to contribute to the hemodynamic disregulation (Schwartz, 1977) that occurs in the early stages of essential hypertension.

Let us finally go back to the study of Jenkins (1984) of the air traffic controllers. Persons who remained normotensive reported the greatest amount of life change stress. Prevalence cases of hypertension reported the lowest life change distress and future cases recorded intermediate levels. Future hypertensives showed clearly the highest average on work satisfaction and satisfaction with co-workers. Normotensives had the lowest averages on both these scales. These findings are thus in conflict with the usual stress theory, but they are consistent with the hypothesis that hypertensives perceive their world in a quite different way from normotensives in that they deny the negatively toned aspects of circumstances around them. If psychosocial variables do not provide much help in understanding differences between hypertensives and normotensives, perhaps greater insights can be obtained from considering the ways in which people cope with the problems which confront them.

It is necessary to involve the process of appraisal and coping when psychosocial and bioclinical variables are studied in relation to the development of essential hypertension.

8.2 Coping: definition and conceptualizations

"Coping refers to cognitive and behavioural efforts to master, reduce or tolerate the internal and/or external demands that are created by the stressful transaction" (Lazarus and Launier, 1978). An important feature of this definition is that coping is defined independently of its outcome. The effectiveness of any given coping strategy is not inherent in the strategy. This approach differs from psychodynamic conceptualizations in which certain intrapsychic defense processes such as denial, are considered inherently poorer than others, such as suppression, or in which a strategy is labeled coping only if it satisfies certain criteria, such as adhering to reality.

The definition of Lazarus (1978) of coping is extraordinarily broad and refers to a process. Coping is not a static activity, it is a process that consists of many separate patterns of behaviour, a process that continually changes in quality and intensity, depending on information, recently perceived, consequences of responses and the results of earlier responses. It is a complex system of thoughts and behaviour in which different forms of coping interact. As a situation changes, no strategies change in importance and adequacy.

Pearlin and Schooler (1978) identify three major types of coping that are distinguished from one another by their functions:

1. responses which change the situation out of which strainful experience arises,
2. responses that control the meaning of the strainful experience after it occurs but before the emergence of stress, and
3. responses that function more for the control of stress itself after it has emerged (one tries to reduce or eliminate the experienced arousal).

In practice it turns out to be difficult to distinguish between the different forms of coping and their functions. Most patterns of behaviour do not exclusively influence either the situation, the perception or the tension, but they can influence each other simultaneously or sequentially.

The effectiveness of coping

It has been acknowledged now that health is a product of effective coping rather than simply a consequence of the presence or absence of stress. One of the most intriguing questions in stress and coping research concerns the adaptational consequences of forms of coping; are certain forms of coping more effective, more adequate, than others, in terms of positive effects on health and social functioning? When such a question is asked, first of all a distinction must be made between short term and long term effects. Forms of coping may have a favourable effect in the short term but are not necessarily favourable in the long term. Using a form of coping such as avoidance behaviour can be effective because it reduces the physiological and emotional tension. If the source of the conflict remains present, the same form can, however, in the long run, lead to somatic disorders.

Secondly, it is necessary that the nature of the event, the way in which it is perceived and the context in which the event takes place, are included in the research model in order to answer the question of effectiveness of coping. As already mentioned, Dohrenwend and Dohrenwend (1974) suggest that situational factors such as intensity, duration, frequency and unpredictability and uncontrollability of stressful events are important dimensions in this regard. The evaluation of coping options are influenced by these factors but also the previous experiences in similar situations, the perceived availability of personal (skills) and environmental resources (social support).

Approaches to measure coping

The different forms of coping must be specified and classified in order to make it possible to study the determinants and consequences of the coping behaviour.

The attempts made up to now to measure coping are mainly based on the following three approaches:

a. Coping conceptualized in terms of ego or defence processes

The psychoanalytical view of defence is that of unconsciously operating mechanisms which protect the ego from conflict and do so by means of self-deception and the distortion of reality (Freud, 1946). According to Vaillant (1971) they moderate levels of emotion produced by stress, they help keep awareness of certain drives at a minimum level, they provide time to help an individual deal with life traumas, and they help deal with unresolvable loss. Haan (1977) started from the psychoanalytical frame of reference when compiling her questionnaire, in which both defence mechanisms and coping mechanisms were differentiated. She suggested a triple system of ego processes, in which she differentiates between coping, defence and fragmentation.

Lazarus (1982) objects to such an equation, because the starting point is an a priori judgment on the value of different processes. A judgment which is given, separate from the context in which the process takes place. This conceptualization places also a one-sided emphasis on reducing tension, and recovering the physiological balance. Another function of coping, namely to face the problem situation, should also have attention. Plutchik (1979) signalized the need for a coherent model of defences and noted that there exists an extensive overlap of meanings of the ego-defences. They also inventorised self-report measures of defence mechanisms. The measures were often restricted to only a few defences, e.g. denial, rationalization, and projection (Gleser and Ihilevich, 1969; Little and Fisher, 1958; Kreitler and Kreitler, 1972; Sarason, Ganzer and Singer, 1972; Sweney and May, 1970). Several of the scales are simply a rearrangement of items from the MMPI (Byrne, 1961; Little and Fisher, 1956; Millemet, 1970; Sarason, 1958). In half of the studies references to internal reliability are absent and in some no reference is made to validity issues, or only restricted to correlations with MMPI scales.

Plutchik (1979) developed the Life Style Index of 138 items measuring 16 defence mechanisms. Several studies of the similarity structure of ego defences provided empirical support for the theoretical model. The following 8 scales were finally constructed:

- Displacement, projection, compensation
- Identification, regression
- Fantasy

- Acting out, repression
- Introjection
- Isolation, denial, reaction formation, intellectualization
- Rationalization
- Undoing, sublimation

A possible measure to assess coping was suggested - the Defence Mechanisms Test (Kragh, 1969) which examines subjects' responses to a series of stimuli presented tachistoscopically. This subliminal technique has high reliability and some evidence for its validity as a measure of how subjects react to threat.

b. Coping conceptualized as a personality trait

In this approach the starting point is that people are behaviourally and cognitively consistent about different problematic situations. For this reaction pattern we can use the term "coping style". Individual differences in style are the result of earlier learning experiences, personality traits and behaviour patterns, such as Type A behaviour, an internal versus external locus of control, the degree of assertiveness etc. The use of the concept "style" is seen in a broad sense and is not seen as a static quality, just as it is seen in the concept "personality trait" not static. A style is characterized by a certain stability, but is changeable. Two illustrations of this approach are the Coping Scale of Westbrook (1979) and the Scale of Robbins and Tanck (1978).

The Westbrook Scale is a list of 30 items of coping strategies. Via multidimensional scaling of similarity ratings she compiled 6 clusters of strategies: 1) action/confrontation, 2) escape/avoidance, 3) seeking interpersonal help, 4) optimism, 5) fatalism, 6) control over the situation. Values of reliability and validity are not published so far as we know. The experience with a Dutch version of this scale yields only four strategies but also low reliabilities. Further empirical data are necessary.

Robbins and Tanck (1978) arrived at 7 factors after analysis of their questionnaire of 22 items, namely: 1) seeking social support, 2) disfunctional behaviour, 3) narcotizing anxiety, 4) problem solving, 5) seeking professional help, 6) acceptance or hanging on until the tension passes, 7) and a final factor that has a connotation of escape but can better be interpreted as seeking distraction. The same remark as for the Westbrook Scale can be made on this scale: further research is necessary in order to evaluate the psychometric aspects.

c. Coping as a transactional process

Coping conceived as a transactional process between the situation and the person is worked out by Lazarus and his group. In order to measure these complex interactions adequately, it is important to specify the situation. The inventorised coping strategies are grouped according to their function. Although these functions often include defences they are not described from the defence theory, but rather in terms of the function they fulfill in a specific situation.

Lazarus and his group developed a checklist "The ways of coping". It is a list of 68 items containing a wide range of thoughts and actions that people use in a specific stressful event. Usually the event is described by the subject in an interview. At the end of the checklist there are four questions designed to elicit information about how the situation was appraised with respect to whether it was an event where something could be done, which had to be accepted, where more information was needed, or where it was necessary to hold back. The checklist includes items from the domain of defence coping (e.g. avoidance, intellectualization, isolation, suppression), information seeking, problem-solving, palliation, inhibition of action, direct action, and magical thinking. Originally there were two scales: one to measure problem-focused coping and one to measure emotion-focused coping. Research is going on with principal factor analyses to devise several subscales. This scale is not designed to assess coping styles as traits. It is designed as a process measure. It is possible, however, to look for consistency (style) across occasions by administering the measure repeatedly and then doing intra-individual analysis.

9. Social support

The current emphasis in stress and illness research is on moderating variables. The low correlations between life events and mental and physical symptomatology has prompted attempts to specify the variables responsible for buffering the illness-provoking effects of stress. The list of variables includes physiological or constitutional strengths, several psychological characteristics, coping behaviour and social support.

Social support has been defined as "support accessible to an individual through social ties to other individuals, groups and the large community" (Lin 1979). Social support creates feelings of being loved and cared for and of being approved and regarded favourably in social groups (Cobb, 1976).

While social support has been conceptualized as a mediator or buffer between the occurence of stressful life events and subsequent physical or psychological symptoms, as well as an independent contributor to health, it has typically been measured and interpreted as a global unidimensional construct. Most studies on social support and the relation with physical illness and social psychopathology use a different conceptualization and measurement of social support. The concept is not well formulated and the instruments are not cross-validated. Most of the studies treat social network, psychosocial assets, and perceived social support as interchangeable concepts. This limits the extent to which existing findings can be integrated. Careful distinctions have to be drawn among possible conceptions of social support and these must be explored in suitable designs and assessments. The most important distinction to be made is between the number of relationships a person has and the person's perception of the supportive value of social interactions. The former is usually referred to as the social network; the latter, as perceived social support.

When structural measures of social network size are used to indicate the benefits of social relationship, two questionable assumptions are made, namely, that any benefits are directly proportional to the size and range of the network and that having a relationship is equivalent to getting support. The latter assumption also applies when a single social connection such as marriage or having a confidant is used.

Perceived social support involves an evaluation or appraisal of whether and to what extent an interaction, pattern of interactions, or relationships is helpful.

The major reason to distinguish between perceived social support and social network is that they might have different effects on health, morale and psychological functioning.

Social network measures encompass many psychological processes within the same measure, not all of which may be positive in their adaptational consequences. Positive processes include being embedded in a network of persons who could provide diverse types of support when needed in specific stressful encounters or who provide meaning to one's life in general. Negative processes include the stressful demands made by others, the constraints they exercise over one's choices, the efforts required to sustain the network and the disappointments often inherent in such relationship when help is needed but not provided.

Types or functions of social support

Most investigators of social support have assumed that it is the emotional support or feelings of intimacy derived from social ties which are important to health and well-being. Yet social support can have a number of independent components servicing a variety of supportive functions. Weiss (1974) discussed six dimensions of social relationship to maintain psychological well-being:

- attachment
- social integration
- opportunity for nurturance
- reassurance of worth
- a sense of reliable alliance
- obtaining guidance

Kaplan (1977), Gore (1978), made similar suggestions. Virtually all studies of social support emphasize the attachment and affiliative functions of support over the instrumental, material, or social integration functions.

We support the opinion of Schaefer, Coyne and Lazarus (1981) that it is useful to assess the emotional, tangible and informational support functions separately and to assess their interrelationships. Emotional support includes intimacy and attachment, reassurance, and being able to confide in and rely on another - all of which contribute to the feeling that one is loved or cared about, or even that one is a member of the group. Tangible support involves direct aid or services and can include loans, gifts of money or goods, and provision of services such as taking care of needy persons or doing a chore for them. Informational support includes giving information and advice which could help a person solve a problem and providing feedback about how a person is doing.

As with the distinction between social networks and perceived social support, the importance of distinguishing among different types of support lies in the possibility that they may have independent effects on health and psychological functioning. Emotional support may encourage a person to sustain, redouble, or renew coping efforts that increase the likelihood of stress management or mastery. Informational support may affect adaptational outcomes by suggesting alternative solutions to a problem or help a person reappraise a situation in the direction of stress reduction.

In work, social support from superiors, subordinates, and peers improves the ability of people to cope with job stress. Support from supervisors, co-workers and subordinates has been found to modify the effects of work stressors on various psychophysiological and behavioural symptoms of stress (Caplan, 1972; French, 1972). Good relations in the workplace, especially with one's subordinates, were found to act as a buffer against the stressful effects of too heavy a quantitative work load. The effect was especially seen in the physiological stress reactions and less in the measures of psychological stress responses (French, 1973).

Social support from family members and supervisors has been found to be especially effective in mitigating the effects of perceived work stress on health. The effect of the support from co-workers and relatives seems less effective (McMichael, 1972).

In a study of men forced to change jobs, psychophysiological stress reactions were measured only in those men who reported receiving low support from other people in their private life (Cobb, 1976; Gore, 1978).

The mechanism by which social support mediates its buffering effects is not known. This action may take place on at least four levels. It may reduce the objective environmental stress factors, affect only the perceived stress factors, perceived stress reactions, or increase the coping resources of an individual (French, 1973).

In a study of 1246 employees in 13 different industrial organizations in the Netherlands (Winnubst 1982), analysis based on a (moderate) regression technique showed a strong buffering effect against high blood pressure (SBP and DBP) of social support given by the supervisor in case of psychological problems.

Measurement of Social Support

The conceptualizations and operationalizations of social support vary to a great extent (Sarason, 1983). Social support has been measured with a multitude of indicators and techniques ranging from single questions to inventories that include a number of multi-item scales. This diversity indicates that the data on social support, derived from various reports, must be interpreted with great caution and with a reference to the actually applied instruments. There is some empirical evidence that social support can buffer and protect against stressful experiences (Thoits, 1982). One of the best documented social support inventories is developed by McFarlane (1981). This is a questionnaire method that has been applied as a part of a home interview. The interviewee is first presented with six categories of potential areas of life stress: work, money and finances, personal health, and issues that relate to society in general. The questionnaire requires the subjects to list those persons (initials only), noting also the type of relationship (co-worker, relatives, etc.) with whom they have had discussions concerning each of the above problem areas. Subjects are asked to rate the helpfulness of the discussions they had with each person mentioned. For the clarification of the reciprocity of the relationship the subject is asked to mark those individuals who contact the subject for similar discussions. As a second measure, the subjects are requested to mention the key persons to whom they would turn for support in times of severe stress. It is also asked if these relations are reciprocal. The authors report a number of scale statistics based on a field trial of the interview. The validity and the test-retest reliability of the method indicate that it can be regarded as an appropriate instrument for measuring social support based on the interpersonal relations.

10. Work-related factors

A great body of literature has demonstrated that psychosocial factors at work contribute to a wide range of workers' health disorders. Much evidence has accumulated on the relation of unspecific psychological, behavioural, and somatic syndromes to stressful or strongly unrewarding job conditions. Positive psychosocial job factors can, in turn, act as health maintaining and enhancing agents. The link between concrete job conditions, either positive or negative, to health outcomes is by no means a linear two-factor interrelationship. On the contrary, it is processed through many internal characteristics of the individuals and their life circumstances outside work. Time factor adds to the complexity of the process.

The most common approach in dealing with the linkages between psychosocial work environment and workers' health has been the application of the stress research paradigm. Consecutively the process has been seen as a combination of three major conceptual domains: sources of stress, moderators of stress, and stress manifestations and outcomes. Each of these extended components of the process covers a variety of subparts.

Physical work environment

In the surveys concerning the working conditions of various occupational groups, workers' complaints often emphasize noise and thermal conditions. Moreover, vibration and chemical factors are frequently reported as the most harmful perceived stressors. In a survey of blue-collar workers in Finland, noise was reported as a moderately harmful hazard by 52% of the respondents, and 47% of them rated thermal conditions in the same manner (Koskela, 1973).

Numerous studies have been reported which confirm that physical health is adversely affected by a dehumanizing combination of physical and mental hazards in the work environment (Cox, 1980). Such are, for example, noisy factories where repetitive work is done in paced assembly lines with minimum amount of social interaction between the workers.

Physical insecurity. Certain occupations have been identified as being high risk in terms of danger, e.g. police, mine workers, soldiers, prison personnel and firemen (Davidson and Veno, 1980; Kalimo, 1980; Kasl, 1973). However, stress induced by the uncertainty of physical danger events is often substantially relieved if the employee feels adequately trained and equipped to cope with emergency situations.

Factors intrinsic to job:

- Overload. Work overload is characterized as being either quantitative (i.e., having too much to do) or qualitative (i.e., work being too difficult). Various types of behavioural malfunctions and perceived symptoms have been associated with job overload (Cooper and Marshall, 1976; Kasl, 1973).

- Underload. Repetitive, routine, and understimulating work environments typical for mass production (e.g., paced assembly lines) and some clerical tasks have been associated with various types of organizational and health complaints, physiological disturbances and ill-health (Cox, 1980). The effects of underload are often aggravated by a lack of control over the work situation (Gardell, 1976). Underload may also be a problem related to application of high modern technology.

- Shift work. Shift work is known to affect biological rhythms, such as body temperature, metabolic rate, blood sugar levels, and mental efficiency and work motivation. A study by Cobb and Rose (1973) on air traffic controllers showed four times the prevalence of hypertension and also more mild diabetes and peptic ulcers than in their control group of second class airmen.

- Workers' Role. A person's role at work has been shown as a major source of occupational stress when it involves role ambiguity (a lack of clarity about the tasks) and role conflict (conflicting job demands) (Kahn, 1973), and conflicts stemming from organizational boundaries (Cooper and Marshall, 1976). It has been indicated that organizational stressors stemming from role ambiguity and conflict can be associated with a risk of cardiovascular disorders (e.g. Eden, 1973). Managerial, clerical and professional occupations are especially prone to occupational stress related to role conflict.

- Workers' Participation

Organizational structure and climate, which include such factors as office politics, lack of effective consultation, lack of participation in the decision-making process and restrictions on behaviour comprise a complex of factors which to a great extent affect workers' well-being.

- Relationships at Work

Relationship at work, which refer to the nature of relationships and social support from one's colleagues, supervisors and subordinates, have been related to job stress (Payne, 1980).

Introduction of New Technologies

Psychological stress and related health problems associated with the automated information processing and the application of video display terminals at work are currently a great concern of labour parties and occupational health professionals in the 1980s. Scientific investigations have been made on the ergonomic and hygienic work conditions in the automated work processes (Cakir 1979). These investigations have already pointed out a basis for criteria of the hygienic and ergonomic conditions of work in computerized work designs.

A detailed review of 46 job satisfaction measures was recently made by Cook (1981). This is an excellent source of reference for selection of job satisfaction measures for various purposes. See also validation data on the "Worker Opinion Survey" (Soutar and Weaver, 1982).

For gathering data on the work characteristics as possible health hazards and health promoting factors two basic types of methods are applied:

(1) analysis of work with observation techniques, measurements, statistics and theoretical analysis, and
(2) asking the workers directly how they perceive in work and work conditions. In this approach questionnaire and interview techniques are applied.

Questionnaire Techniques

A properly planned and administered questionnaire which has a sound theoretical basis is a quick and economic methodological tool, especially in the study of large population groups and wide surveys of various workplaces. Additionally, a questionnaire offers a possibility for gathering data about the workers' expectations in regard to their work conditions. This approach is especially relevant in the research based on the person-environment fit approach.

Observation methods

Observation of work conditions is an alternative method for gathering data on the possible psychosocial hazards and the health promoting factors at work. Two main approaches are applied. If the impact of the work characteristics on the worker is considered in the assessment the approach is called evaluative. In a descriptive assessment the work characteristics are merely recorded according to certain criteria. These results are evaluated later from the view point of their possible impact on the worker.

In general, the application of rating methods for gathering data on stressors and mental load factors can be reliably performed only by experienced raters. The rater can hardly, in all circumstances, be considered to possess the knowledge and expertise. Opinions and preferences of the rater tend to affect the ratings.

11. Social factors

A reasonable conclusion from the literature on primary hypertension is that overweight, salt intake, certain toxic occupational factors and excessive alcohol consumption are known or at least probably risk factors for essential hypertension, that could be influenced in public health actions. Psychosocial factors may influence eating and drinking habits and risk taking behaviour at work, and thus they could be an important target for action on several levels. Psychosocial factors may also be successfully influenced in public health programmes, and therefore they deserve attention in the creation of such a programme.

The role of social and psychic factors in the pathogenesis of obesity has been studied extensively. Stunkard (1975) has reviewed the literature, concluding that there is a strong social factor (low socioeconomic status is associated with high pressure) and a weaker neurotic factor in obesity.

The role of psychic factors in salt intake is unknown. It is quite conceivable that psychic factors may influence salt hunger. Many cultures that go through a process or urbanization increase their salt intake and it is also possible that low socioeconomic status in urbanized countries is associated with a high sodium intake. Furthermore, psychophysiological activation increases salt retention. Therefore the effects of salt intake may be aggravated by psychosocial factors.

Alcohol habits are influenced by a number of social factors. It has been shown that alcohol intake increases in the recently unemployed and in other periods of crisis.

The conclusion is that public health programmes against hypertension should be differently organized for different groups of the population. This is true both when we talk about diet and psychosocial factors. The health counsellor's understanding of people's reasons for eating the wrong food, drinking too much alcohol, etc., will be one of the most important determinants of the programme's success.

No international comparative analysis is available on connections between the blood pressure of the population and national economic and social characteristics that is based on sufficient statistical data. This is certainly not due to the fact that no attention is being paid to this question, but rather to the fact that no conceptual frameworks have been worked out and there is a lack of adequate collection of data.

12. Conclusions

Assessment of individual characteristics, attitudes and coping

1. In using tests in countries other than that where the test was developed it was noted that new norms, new factor analyses, new item analyses and item-rewriting were necessary.

2. In assessing personality, multifactorial tests and inventories were likely to be the most useful. Personality traits and states should be distinguished.

3. Projective tests in general have low reliability and usually little evidence for validity. They should only be used with great caution.

Assessment of stressful experiences

1. Frequency, intensity, duration, unpredictability and uncontrollability of stressful events are important dimensions in the etiology of psychosomatic disorders.

2. Life event scales can be useful in a therapeutic setting in order to make adequate behaviour analysis.

3. Various methods to construct inventories of life events are available. It is valuable to measure the impact of the event by investigating, for example, the perceived positive and/or negative aspects and pleasantness/unpleasantness. How such items should be weighed remains uncertain.

Social network and social support

1. Social network size and amount of social support are not necessarily correlated. To assume a positive correlation ignores the demands, constraints and conflicts already associated with social relationships.

2. Social support can take a number of forms, for example emotional, tangible and informational support. Each of these can have a different effect on health outcome.

Assessment of work-related factors

1. There is inconclusive evidence relating inappropriate job demands and lack of control to hypertension.

2. Workers' perceptions of working conditions measured by questionnaire, have higher correlations with health outcomes than does 'objective' assessment of work through job descriptions. However, in the first case there are measurement artefacts (the same subjects complete both tests) and questionnaires and 'objective' assessments should be used.

3. Retailed job description is a valuable technique of measurement for better understanding of work-related factors in the etiology of hypertension.

The relation of Macro-social indices and hypertension

1. The relationship between macro-social indices, such as social organization and structure and hypertension remains to be elucidated.

Community based approaches to hypertension

1. The study of psychosocial variables is important in examining the efficacy of different kinds of treatment in hypertension. For example, beliefs about and attitudes towards medication or therapy can all affect hypertension control and should be measured. Different measures may be required for population screening and intensive clinical testing.

2. The study of such variables is also important in assessing the impact of health education schemes on prevention of hypertension

The psychometrics of psychosocial measurement

1. The type "A" behaviour pattern which may be important in the control of hypertension is better measured by interview than by using a questionnaire, e.g. Jenkins Activity Scale, Sales Scale, Bortner Scale.

2. However, the three factors of the JAS should be disentangled and the notion of type should be dropped since A or B behaviour patterns are the ends of a continuum.

3. The dangers of multiple regression and discriminant functions unless replications on new samples or on report samples were noted. Canonical analysis was suggested as a possible alternative procedure.

13. Recommendations

Assessment of individual characteristics, attitudes and coping

1. The MMPI can be useful for example by discriminating depressives and those with hypochondriacal tendencies in rehabilitation. However, some scales have low reliability and validity. The names of the subscales have little psychological meaning but merely reflect the way the scales were constructed.

2. Statistical methods, especially factor analytic procedures, should be specified in sufficient detail for replication.

3. Attitudes and beliefs are important in the control of hypertension and these should be measured using scales with as high reliability and validity as possible.

4. In clinical settings rating scales especially when tied to the observation of specific behaviour patterns can be valuable.

5. There are various instruments for the assessment of coping. However, further research is required to develop these into instruments with acceptable reliability and validity.

Assessment of stressful experiences

1. The measurement of change in life events is important. However, problematic circumstances, chronic, long lasting life events and daily difficulties and pleasures also deserve measurement. Good scales need to be developed for this.

Social network and social support

1. It is important to distinguish between social network (the number of relationships which a person has) and perceived social support.

2. The measurement of social support and networks requires further research to produce reliable and valid techniques of assessment, although some instruments have been constructed.

Assessment of work related factors

1. Research should be undertaken to discover whether the casual (temporary) elevations in blood pressure to work load result in sustained hypertension

Community based approaches to hypertension

1. Prospective studies are relevant in assessing the role of psychosocial variables in the development of hypertension. However, the duration of the study must not be too long unless there is further measurement during this period. This prevents confounding by variables such as changing life styles, changing habits and information about health related factors.

The psychometrics of psychosocial measurement

1. The importance of high reliability, high validity and relevant standardisation of all tests was emphasised. These characteristics have to be demonstrated when a test is used in a new country.

2. High priority was given to improving the psychometric characteristics of those tests already found useful in the study of hypertension.

14. General recommendations

It is recommended that WHO should foster international contact between researchers into hypertension for two purposes:

(a) to develop psychosocial measures of high psychometric quality and true cross-cultural equivalence. This will allow for real international comparison.

(b) To enable a clear conceptual framework to be developed which will be equally applicable and relevant in all countries involved in the study of hypertension.

Research recommendation

It is clear that an important area of research is to determine whether temporary elevations in blood pressure in response to environmental stimuli lead to sustained hypertension.

Annex

LIST OF PARTICIPANTS

TEMPORARY ADVISERS

Dr R. Kalimo
Institute of Occupational Health, Vantaa, Finland

Dr P. Makara
MTA Szociologiai Intezet, Budapest, Hungary

Dr B.G.G. Schrsurs
Department of Clinical Psychology, University of Utrecht, Netherlands, (Rapporteur)

Dr T. Ayvazyan
Laboratory of Clinical Psychology, Myasnikov Institute of Cardiology, All Union Cardiology Research Centre, Moscow, USSR

Dr A. Gostautas
Head, Laboratory of Psychology and Sociologic Investigation, Kaunas Medical Institute, Lithuanian SSR

Dr V. Khramelashvili
Laboratory of Clinical Psychology, Myasnikov Institute of Cardiology, All Union Cardiology Research Centre, Moscow, USSR

Dr R. Rojanetz
Head, Laboratory of Psychological Investigations, Institute of Preventive Cardiology, All Union Cardiology Research Centre, Moscow, USSR

Professor P. Kline
Department of Psychology, University of Exeter, United Kingdom

Dr I. Glasunov
Chief, Laboratory of Multifactorial Prophylaxis, All-Union Scientific Centre for Cardiology, Moscow, USSR

WORLD HEALTH ORGANIZATION

Professor Vadim P. Zaitsev
Regional Officer for Chronic Diseases

Ms A. Andkjaer
Secretary

References

Alexander, F. Emotional factors in essential hypertension: presentation of a tentative hypothesis. Psychosomatic Medicine, 1 (1939), pp. 173-179.

Brown, G.W. Meaning, measurement and stress of life-events. In: B.S. Dohrenwend. B.P. Dohrenwend (Eds).Stressful life events: Their nature and effects. New York, Wiley, (1974).

Byrne, D. The repression-sensitization scale: rationale, reliability and validity. Journal of Personality, 29 (1961), pp. 334-349.

Cakir, A. et al. Visual display terminals. New York, John Wiley & Sons, (1979)

Caplan, R.D., J.R.P. French, Organizational stress and individual stra- In: A.J. Marrow (Ed.) The failure of success. New York, Amacom, (1972).

Cobb, S., R.M. Rose. Hypertension, peptic ulcer and diabetes in air traffic controllers. Journal of the American Medical Association, 224 (4), (1973) pp. 489-492.

Cobb, S.,Social support as a moderator of life stresses. Psychosomatic Medicine, 38 (1976), pp. 300-314.

Cochrane, R. Hostility and neurotisism among unselected essential hypertensives. Journal of Psychosomatic Research, 17 (1973), pp. 215-218.

Cook, J.D. et al. The experience of work. A compendium and review of 249 measures and their use. London, Academic Press, (1981).

Cooper, C.L., J. Marshall, Occupational sources of stress. A review of the literature relating to coronary heart disease and mental ill health. Journal of occupational psychology, 49 (1976), pp. 11-28.

Cox, T. Repetitive work. In: C.L. Cooper, R. Payne, (Eds). Current concerns in occupational stress. Chichester, NY, John Wiley & Sons, (1980) pp. 23-42.

Davidson, M.J., A. Veno. Stress and the policeman. In: C.L. Cooper, J. Marshall (eds). White collar and professional stress. London, John Wiley & Sons, (1980)

Dembroski, T. et al. Components of the type A coronary-prone behaviour pattern and cardiovascular responses to psychomotor performance challenge. Journal of Behavioral Medicine, 1 (1978), pp. 159-176.

Dohrenwend, B.S., B.P. Dohrenwend. Stressful life events. Their nature and their effects. New York, Wiley and Sons, (1974).

Drunkenmolle, C. Psychologische Untersuchungen bei der Essentiellen Hypertonie. Z. Gesamt. Inn. Med. 31 (1976), pp. 289-291.

Eden, D. et al. Job stresses and risk factors in coronary heart disease among five occupational categories in kibbutzim. Social science and medicine, 7 (1973), pp. 875-892.

Egan, K.J., H. Kogan, A. Garber, M. Jarrett. The impact of psychological distress on the control of hypertension. Journal of Human Stress, december (1983), pp. 4-11.

French, J.R., R.D. Caplan. Organizational stress and individual strain. In: A.J. Marrow (ed.).The Failure of Stress. New York, Amacom, (1972).

Freud, A. The ego and the mechanisms of defence. New York, International University Press, (1946).

Gardell, B. Technology, alienation and mental health. Acta sociologica, 19 (1976), pp. 83-94.

Gleser,G.C., D.Ihilevich. An objective instrument for measuring defense mechanisms. Journal of Consult. and Clin. Psychology, 33, (1969),pp.51-60.

Gore, S. The effect of social support in moderating the health consequences of unemployment. Journal of Health and Soc. Behaviour, 19 (1978), pp. 157-165.

Gostautas, A.A., I.S. Glasunov, A.S. Leonavitchus, A.V. Baubiniene, V.I. Grabauskas. Attitude of Men Aged 45-59 Years to Health and Disease Prevention (Preventive Study in Kaunas). Cor. Vasa 26 (3) (1984), pp. 182-189.

Graham, J.D.P. High blood pressure after battle. Lancet, 1 (1945), p. 239.

Graham, D.T. Psychosomatic Medicine. In: Handbook of Psychophysiology. N.S. Greenfield, R.A. Sternback. New York, Holt, Rinehart and Winston, (1972).

Haan, N. Coping and defending. New York, Academic Press, (1977).

Handkins, R.E., D.C. Munz. Essential hypertension and self-disclosure. Journal of Clinical Psychology, 34 (1978), pp. 870-875.

Holme, I. et al. Coronary risk factors in various occupational groups. The Oslo Study. B.J. Prev. Soc. M., 31 (1977), pp. 96-100.

Howard, J.H., D.A. Cunningham, P.A. Rechnitzer. Health patterns associated with type A behaviour: a managerial population. J. Human Stress, 2 (1976), pp. 24-31.

Jenkins, C.D. et al. Does blood pressure rise with age?..., or with stress? Journal of Human Stress, 9 (1983), pp. 4-12.

Jenkins, C.D., M.W. Hurst, R.M. Rose, L. Anderson, B.E. Kreger. Biomedical and psychosocial predictors of hypertension in air traffic controllers. In: Stress and Anxiety. Vol. 9. C. Spielberger, E.G. Sarason, P. Defares. New York, Hemisphere, (1984).

Julius, S., C. Cottier. Behaviour and hypertension. In: Dembroski et al. (eds.) Biobehavioral bases of coronary heart disease. Karger, (1983).

Kagan, A.R., L. Levi. Health and environment - psychosocial stimuli: a review Soc. Sci. Med., 8 (1974), pp. 225-241.

Kahn R.L. et al. Organizational stress: Studies in role conflict and ambiguity. New York, Wiley (1964)

Kalimo, R. Stress in work: conceptual analysis and a study on prison personnel. Scandinavian journal of work environment health, 6 (suppl. 3) (1980), p. 148.

Kaplan, B.H., J. Cassel, S. Gore. Social support and health. Medical Care 15 (5) (1979), pp. 47-58.

Kasl, S. Mental health and work environment: an examination of the evidence. Journal of occupational medicine, 15 (6) (1973), pp. 509-518.

Kasl, S.V., S. Cobb. The experience of losing a job: some effects on cardiovascular functioning. Psychotherapy and Psychosomatics, 34 (1980), pp. 88-110.

Keane, T.M. et al. Are hypertensives less assertive? A controlled evaluation. Journal of Consulting and Clinical Psychology, 50 (1982) pp. 499-508.

Kline, P. Psychometrics and Psychology. London, Academic Press, (1979).

Kobasa , S.C., S.R. Maddi, S. Kahn. Hardiness and health: a prospective study. Journal of Pers. and Social Psychology, 42 (1982), pp. 168-177.

Kornitzer M. et al. Invloed van psycho-sociale faktoren op arteriele hypertensie en coronaire aandoeningen. In: D.L. Clement (ed.). Cardiologie. Gent, Omega Editions, (1983).

Koskela, R.S. et al. Tvontekijoiden mielipiteet tyopaikkojen terveydellisista oloista. Helsinki, Institute of Occupational Health, (1973).

Kragh, V. The Defence Mechanism Test. Colytographic Foundation, Lund, (1969).

Kreitler, H., S. Kreitler. The cognitive determinants of defensive behavior. British Journal of Social and Clinical Psychology, 11 (1972), pp. 359-273.

Lazarus, R.S., R. Launier. Stress related transactions between person and environment. In: L.A. Pervin, M. Lewis (Eds.): Perspectives in interactional psychology. New York, Plenum, (1978).

Lazarus, R.S., S. Folkman. Coping and adaptation. In: W.D.Gentry (ed.), The handbook of Behavioral Medicine. New York, Guilford, (1982).

Lin, N., R. Simenone, W. Ensel, W. Kuo. Social support, stressful life events and illness: A model and empirical test. Journal of Health and Soc. Behaviour, 20 (1979), pp.108-119.

Linden, W., M. Feuerstein, Essential hypertension and social coping behaviour. Journal of Human Stress, 7 (1981), pp. 28-34.

Little, K.B., J.Fisher. Two new experimental scales of the MMPI. Journal of Consulting Psychology, 22 (1958), pp.305-306.

MacFarlane, A.H. et al. Methodological issues in developing a scale to measure social support. Schizophrenia bulletin, 7 (1) (1981), pp. 90-100.

MacMichael, A.J. Personality, behavioural and situational modifiers of work stressors. In: Stress at work. Eds. C.L. Cooper, R. Payne. New York, Wiley & Sons, (1979).

Manuck, S.B., R.L. Morrison, A.S. Bellack. Behavioral factors in hypertension: cardiovascular responsivity, anger, and social competence. In: Chesney et al. (eds.).: Anger, hostility and behavioral medicine. New York, Hemisphere, (1984).

Miller, N.E. Effects of learning on physical symptoms produced by psychological stress. In: H. Selye (ed.): Selye's guide to stress research, vol. 1. New York, Van Nostrand, (1980).

Miller, N.E., B.R. Dworkin. Critical issues in therapeutic applications of biofeedback. In: Schwartz, Beatty (eds.), Biofeedback. New York, Academic, (1977).

Millimet, C.R. Manifest anxiety-defensiveness scale: First factor of the MMPI revisited. Psychological Reports, 27 (1970), pp. 603-616.

Minsky, P.J. High blood-pressure and interpersonal "disengagement": a study of maladaptive coping styles and ameliorative treatments. Dissertation Abstracts International, 38 (1978), pp. 11-13.

Myers, H.F. et al. Life events stress, subjective appraisal and somatization in hypertension: a pilot study. Journal of Human Stress, 4 (1981), pp. 17-27.

Obrist, P.A. The cardiovascular-behavioral interactions as it appears today. Psychophysiology, 13 (1976), pp. 95-107.

Obrist, P.A. Blood pressure control mechanisms and stress implications for the etiology of hypertension. In: Onesti et al.(eds). Hypertension, physiopathology and treatment. New York, Mac-Graw Hill, (1979).

Osti, R.M. et al. Stress and distress in essential hypertension. Psychotherapy and Psychosomatics, 33 (1980), pp. 193-197.

Parkes, K.R. Locus of control, cognitive appraisal and coping in stressful episodes. Journal of Personality and Social Psychology, 46 (1984) pp. 655-668.

Payne, R. Organizational stress and social support. In: C.L. Cooper, R. Payne (eds.). Current concerns in occupational stress. Chichester, New York, John Wiley & Sons, (1980).

Pearlin, L.T., K. Schooler. The structure of coping. Journal of Health and Social Behaviour, 19 (1978), pp. 2-21.

Plutchik, R., H. Kellerman, H.R. Conte. A structural theory of ego defences and emotions. In: C. Izard, Emotions in personality and psychopathology. New York, Plenum, (1979).

Rahe, R.H. The pathway between subjects' recent life changes and their near-future illness reports. In: Stressful life events. Eds: B.S. Dohrenwend, B.P. Dohrenwend. New York, Wiley, (1974).

Robbins, P.R., H.H. Tanck. A factor analysis of coping behaviours. Journal of Clinical Psychology, 34 (1978), pp. 379-380.

Rosenman, R.H. et al. Western Collaborative group study: a follow-up experience of two years. Journal of the American Medical Association, 195 (1966), pp. 86-95.

Ruskin, A., O. Beard, R. Schaffer. Blast hypertension: Elevated arterial pressure in victims of the Texas City Disaster. American Journal of Medicine, 4 (1948), pp. 228-236.

Sapira, J.D., E. Scheib, R. Moriarty, A.P. Shapiro. Differences in perception between hypertensive and normotensive populations. Psychosomatic Medicine, 33 (1971), pp. 239-250.

Sarason, I.G. Interrelationships among individual difference variables, behavior in psychotherapy, and verbal conditioning. Journal of Abnormal and Social Psychology, 56 (1958), pp. 339-344.

Sarason, I.G., H.M. Levine, R.B. Basham, B.R. Sarason. Assessing Social Support The Social Support Questionnaire. Journal of Personality and Social Psychology, 44 (1) (1983), pp. 127-139.

Sarason, I.G., N.J. Ganzer, M. Singer. Effects of modeled self-disclosure on the verbal behavior of persons differing in defensiveness. Journal of Consulting and Clinical Psychology, 39 (1972), pp. 483-490.

Schaefer, C., J.C. Coyne, R.S. Lazarus. The health-related functions of social support. Journal of Behavioral Medicine, 4 (1981), pp. 381-405.

Scherwitz, L., K. Berton, H. Leventhal. Type A behaviour, self-involvement and cardiovascular response. Psychosomatic Medicine, 40 (1978), pp. 593-610.

Schwartz, G.E. Psychosomatic disorders and biofeedback: a psychobiological model of disregulation. In: Maser, Seligman (eds.): Psychopathology: experimental models, San Francisco, Freeman, (1977).

Shapiro A.P. et al. The role of stress in hypertension. Journal of Human Stress 5 (1979), pp. 7-48.

Shekelle, R.B., J.A. Schoenberger, J. Stamler. Correlates of the JAS type A behaviour pattern score. Journal of Chronic Diseases, 29 (1976), pp. 381-394.

Singer, J.L. Research applications of projective methods. In: A.I. Rabin (ed.) Projective techniques in personality assessment. New York, Springer Publishing Co. (1968).

Soutar, G.N., J.R. Weaver. The measurement of shop-floor job satisfaction: the convergent and discriminant validity of the worker opinion survey. Journal of occupational psychology, 55 (1982), pp. 27-33.

Stunkard, A.J. Presidential address 1974: From explanation to action in psychosomatic medicine: The case of obesity. Psychosomatic Medicine, 37 (1975), pp. 195-236.

Svensson, J. Early Stages of Essential Hypertension in a Psychosomatic Perspective - epidemiological, clinical, psychophysiological and psychological studies of 18-year-old men. Thesis from Dep. of Psychology, University of Stockholm, (1983).

Sweney, A., J.M. May. The defense mechanism index: Handbook and interpretation manual. Kansas Test Systems, (1979).

Syme, S.L. Psychosocial determinants of hypertension. In: G. Onesti, K. Kim (eds). Hypertension - Physiopathology and treatment. New York, Mc Graw Hill, (1979)

Tanck, R.H., P.R. Robbins. Assertiveness, locus of control and coping behaviors used to diminish tension. Journal of personality assessment 43:4 (1979), pp. 396-400.

Thoits, P.A. Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. Journal of health and social behaviour, 23 (1982), pp. 145-159.

Vaillant, G.E. Theoretical hierarchy of adaptive ego mechanisms. Archives of general psychiatry, 24 (1971), pp. 107-118.

Weiner, H., M.T. Singer, M.F. Reiser. Cardiovascular responses and their psychological correlates: A study in healthy young adults and patients with peptic ulcer and hypertension. Psychosomatic Medicine, 24 (1962), pp. 477

Weiss, S.M. Individual differences and hypertension control. Paper presented at the meeting on psychosocial factors related to hypertension control, Maastricht, WHO, (1984).

Wennerholm, M.A., T.H. Zarle. Internal-external control defensiveness and anxiety in hypertensive patients. Journal of Clinical Psychology, 32 (1976), pp. 643-648.

Westbrook, M.T. A classification of coping behaviour based on multi-dimensional scaling of similarity ratings. Journal of Clinical Psychology 35 (1979), pp. 407-410.

Winnubst, J.A.M., F.H.G. Marcelissen, R.J. Kleber. Effects of social support in the stressor-strain relationship: A Dutch sample. Social Science and Medicine, 16 (4) (1982), pp. 475-482.

Zimmerman, M.K. Perceived stress and coping behaviour: a social psychologic comparison of hypertensive and normotensive employees. Preventive Medicine, 8 (1979).