

Psychosocial Stressors in Inter-human Relationships and Health at Each Life Stage: A Review

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Abstract

Currently, psychosocial stressors' impacts on health are increasing. Among these stressors, this review focused on inter-human relationships. Since social supports could be protective against ill health, consequences contributing to psychosocial stressors are discussed here in relation to social supports for each stage of childhood, adulthood and elderly status.

For childhood, parental divorce/isolation, and child abuse/neglect appeared to be determinants of healthy development at either the initial or later stages. According to prospective studies, such stressors, especially those occurring until around 3 years of age, were associated with later adverse life quality in adulthood. Therefore, nationwide preventive strategies were developed in each country to monitor protective social programs.

For adulthood, job strain was focused on Karasek's job strain model, effort-reward imbalance, employment grade and working hours. These psychosocial stressors were shown to affect not only the physical health but also the mental health of working people. These days, since Karoshi and even suicide related to excessive workloads are taking a toll on workplace organization, stress-coping abilities such as a sense of coherence were introduced from the individual-social interaction aspect.

For elderly status, retirement, caring for the elderly, and spouse bereavement were discussed as psychosocial stressors. Some evidence indicates that these stressors could be determinants of health. Finally, social supports have been demonstrated to promote health and protect the elderly against diseases and death.

Key words: psychosocial stressor, parental divorce, child abuse, job strain, retirement, caring for the elderly, spouse bereavement, social support, sense of coherence

1. Introduction

From the stand point of preventive health, psychosocial stressors requiring proper supportive care in the current society of Japan were reviewed in each life stage. Inter-human relationships playing an important role in supportive care from personal and social aspects in coping against psychosocial stressors will be addressed in this report.

Here, unfavorable care settings relating to parental divorce and abuse in childhood, job strain in adulthood, and retirement, caring for the elderly and spousal bereavement in elderly status were adopted as psychosocial stressors requiring support

resources at each life stage.

2. Major psychosocial stressors in each life stage

1) Childhood

A child's early development substantially depends upon childcare settings. In particular, nurturing, responsive, and supportive caregivers usually have healthier children. The effects of psychosocial stressors in childcare settings on healthy child development were reviewed, generally based on the results from recent studies.

(1) Psychosocial stressors in childhood

① Parental divorce and isolation

In 1991, Amato and Keith (1) published a meta-analysis of 92 studies conducted from the 1950s through the 1980s that compared children residing with divorced and continuously married parents, which indicated that children with divorced

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parents scored significantly lower on a variety of indicators of well-being, including measures of academic achievement, conduct, psychological adjustment, self-concept, social relations, and the quality of relationship with mothers and fathers. The conclusions were reinforced by many of the findings from a recent meta-analysis update covering studies done in the 1990s (2). The rapidly changing nature and demographics of divorce in the United States within the past 30 years has introduced an epidemic that affects more than half of the families there. The past view of divorce as a short-term family crisis must mature into a longitudinal view of the effects of divorce. Divorce affects children according to their coping mechanisms in their own stages of development. Many problems and concerns previously attributed to divorce have their roots in the period of family interaction before the divorce and in the ongoing conflict in many families after the divorce. The loss children feel at divorce is similar to that experienced when a parent dies. Divorce might actually be harder on children because it lacks the concrete cause and finality of death. The immediate reaction of children to divorce does not predict their long-term outcome. Some who seem crushed by the divorce will do well in life, whereas some who seem to take the divorce in stride are severely affected 5 and 10 years later.

Divorce comprises a series of transitions or stages for both children and adults. These stages are similar to the stages Elisabeth Kubler-Ross described for patients with terminal illnesses: denial, anger, bargaining, depression, and acceptance (3). Many studies have shown that children of divorce have more behavioral and conduct problems when compared with children in intact two-parent families (4). They have more aggressive, impulsive, and antisocial behaviors and more problems in their relationships with their mothers and fathers. They exhibit lower academic achievement, with three of four children showing deterioration from their previous school performance. Children who experience divorce at younger ages are more likely to have problems. In the overall population, boys have significantly more externalizing behaviors than girls, regardless of family structure, including being suspended or expelled from school, getting in trouble with police, and running away from home. Depression and anxiety are more common for girls than boys as a result of divorce. Boys living with their divorced fathers and daughters living with their divorced mothers showed fewer effects than children living with the opposite-sex parent (5).

Reactions to divorce in children persist into adulthood. Adults whose parents divorced during childhood are less likely to attend or complete college, are more likely to be unemployed or on welfare, are more likely to have problematic relationships with parents and siblings, and have more trouble forming their own marital relationships (4).

The school dropout rate of children of divorce is more than twice that of children in intact families. While a national survey study found that high levels of marital and family discord prior to divorce accounted for much of the link between parental divorce and measures of educational attainment (6), other research points as well to reduced resources and lowered parental monitoring post-divorce as important factors (7). Children of divorce have poorer school attendance, watch more

television, do less homework, and have less parental supervision of their schoolwork, patterns that are primarily attributable to family disruption (8). Children often experience a substantial decline in their standard of living in the custodial home after divorce, leading to greater economic instability and reduced access to resources that children in intact families are more likely to have, including better schools and neighborhoods. It is estimated that the economic problems of divorced households account for as much as half of the adjustment problems seen in children of divorce (8).

There appear to be significant consequences for some young adults who experienced divorce as children or adolescents (1, 9, 10). Young adults whose parents divorced during childhood, compared with children from intact families, have more pregnancies outside of marriage, earlier marriages (a risk factor for later divorce), poorer marital relationships, increased propensity to divorce, and poorer socioeconomic attainment (7). Parent-child relationships also appear quite vulnerable, in that adults whose parent divorced during childhood show less affection for their parents, have less contact with them, and engage in fewer intergenerational exchanges of assistance compared with adult children from intact families.

② Child abuse/neglect

In recent years, numerous studies have focused on the impact of maltreatment on healthy development in very young children. Gushurst (11) presented a list of more than two dozen behavioral symptoms that have been associated with children who have been physically abused or neglected. In addition, the long-term consequences of child maltreatment in the early years provide a developmental pathway to antisocial behavior unless there is early intervention and disruption of the abuse.

In the year 2000, approximately 3 million referrals to Child Protective Services agencies occurred throughout the United States: 62% were screened and investigated. Of this group, about 879,000 children were found to be victims of maltreatment. About two-thirds of this group suffered neglect, 19% were physically abused, 10% were sexually abused, and 8% were psychologically maltreated (12). Even during the preschool years, the groups that had been neglected showed evidence of anxious and insecure attachments, anger frustration, and noncompliance. At school age, children who had been physically abused were rated as extremely inattentive, unpopular, aggressive, and overactive (13). In a study by the University of Georgia Child Maltreatment Project (14), children who had been neglected had the most severe academic delays and absences. The group that had been abused exhibited more aggression, emotional maladjustment, peer maladjustment, delinquency, other problem behaviors, and poorer self-concepts, even when socioeconomic status was taken into account. The four outcome behaviors of aggression, depression, anxiety, and anger were reported as part of the Longitudinal Studies of Child Abuse and Neglect (15). Even children with self-reports of witnessed violence had significant increases in all of the four behaviors. According to the mothers' reports, aggression, anxiety, depression, dissociation, posttraumatic stress disorder, social problems, thought problems, and social withdrawal were significantly higher in the maltreated group (16).

Initial effects of sexual abuse included fear, anger, hostility,

guilt, shame, sleep disturbances, eating disorders, and an array of sexualized behaviors. Later effects included depression, anxiety, negative self-concepts, interpersonal problems, a tendency toward revictimization, and more self-destructive behaviors (17). More recently, sexually inappropriate behaviors have been found to have a correlation with early onset of sexual abuse (18). Emotional, behavioral, and physical symptoms were reported by parents of prepubescent females in a study by Wells et al. (19). The symptoms that were significantly different between the girls who were definitely sexually abused and those who were allegedly sexually abused were difficulty getting to sleep, noticeable changes in behavior, fear of being left with a particular person, fear of males, becoming withdrawn, unusual self-consciousness, changes in school performance, difficulty concentrating, enhanced sexual knowledge, and unusual interest or curiosity about sexual matters. There have been far fewer studies on boys who are sexually abused, but one that reported on this group found far greater consequences for boys than girls regarding the use of alcohol and drugs, aggressive and criminal behavior, truancy, and suicidal attempts after alleged sexual abuse (20).

Yehuda et al. (21) summarized 50 studies that were conducted between 1984 and 2000 examining the relationship between childhood maltreatment and psychologic symptoms in adults. A history of physical and sexual abuse in childhood increased the likelihood of lifetime psychopathology, such as anxiety disorders, alcohol abuse/dependence, and antisocial behavior. A dose-response relationship was found between the number of types of maltreatment reported and mental health scores (22). Everett and Gallop (23) listed self-harm, suicide,

dissociation, and revictimization as some of the signs in adults that are associated with abuse in childhood. Violent crime in adults also seems to be related to abuse and neglect in childhood (24).

The demographic and psychosocial risk factors for child abuse and neglect are summarized in Table 1.

(2) The social support for healthy child development

The social support toward psychosocial stressors in childhood, especially at the early state, is mostly concerned in an aging society with the number of children on the downswing. Here we discuss some preventive strategies in Japan, the UK and the USA.

The extent of developmental deficit and catch-up following adoption after severe global early privation was examined at 4 years in Romanian children who came to UK before the age of 2 years, and compared with respect to their functioning at the same age to adopted children placed before the age of 6 months (25). The catch-up in both physical growth and cognitive level appeared nearly complete at 4 years for those children who came to the UK before the age of 6 months, but not complete in those placed after 6 months of age. It was concluded that the remaining cognitive deficit was likely to be a consequence of gross early privation, with psychological privation probably more important than nutritional privation. A further follow-up at age 6 confirmed a close association between duration of deprivation and severity of attachment disorder behaviors (26). Child development is an important determinant of health over the life course (27). The early years of life are a period of considerable opportunity for growth and vulnerability to harm. The cumulative experience of buffers or burdens is a more powerful determinant of children’s developmental well-being than single risk or protective factors. Early developmental opportunities establish a critical foundation for children’s academic success, health, and general well-being (28). The goal of many early child development programs is to enable the child, with the support of the parents as the primary caregivers and other caregivers, to establish a developmental path that will prepare him or her for long-term success. Hundreds of programs with a variety of specific emphases have sought to achieve this goal. From these many interventions, a picture of the critical ingredients for successful programs has emerged. In short, the effective programs are often characterized by early prenatal services to expectant women; a two-generational focus; family-centered services that address self-sufficiency through the provision of social services and parent education; quality child development services that are coupled with family services; continuity of service delivery for the child and family that ensures the availability of support over a number of years with smooth transitions to other service delivery systems; intensity of service delivery in terms of availability, accessibility, and usage of services; and consolidation or integration of service delivery systems. Further, research tells us that communities have been found to become more responsive to the needs of low-income families as a result of program activities.

① Commencement of child abuse protection strategy in Japan

In terms of welfare, under the Child Welfare Law (issued in 1947) the Japanese government must expand child welfare

Table 1 Demographic and psychosocial risk factors for child abuse and neglect

Demographic risk factors
① Children born to single parents or to teenagers;
② Children who were unwanted pregnancies that continue to be resented;
③ Children born to parents who are chronically in conflict;
④ Adults living in the home who use alcohol and drugs to the point of losing control;
⑤ Children living in homes of lowest socioeconomic status or whose parents have attained only low education levels;
⑥ The family’s life is seriously disorganized and unpredictable (often a result of earlier items mentioned);
⑦ The child is between 3 months and 3 years of age (time of greatest vulnerability);
⑧ Children who appear different from the average, children who cry a lot, and those with handicaps are most likely to be targeted for harsh treatment.
Psychosocial risk factors
① Parents who were raised in abusive or neglectful homes and reenact these behaviors with their children;
② Male partner’s jealousy and fear of losing “first place” because of the woman’s attention and love for the child
③ Inadequate knowledge of child development, both for normal children and developmentally handicapped children. Failure to recognize the wide variability in reaching development milestones and the inability of the very young “to control themselves” may lead to unreasonable parental demands, outrage that they are “not being obeyed,” and, finally, child abuse.

facilities such as Child Guidance Centers, nursing facilities and day-care centers, enhance the protection of children and assist households. Moreover, under the Maternal and Child Health Law (issued in 1965), which aims to maintain and promote maternal and child health, the government must provide various maternal and child health services such as health guidance for pregnant women, infants and toddlers; health examination of three-year-olds; nutrition improvement assistance; nursing and medical assistance of premature babies; and issuing of the Maternal and Child Health Handbook. To assist child rearing, furthermore, it must provide allowances, under the Child Allowance Law (issued in 1992) and other relevant laws, which contribute to the promotion of child welfare. In recent years, however, the environment surrounding children has been changing due to the falling number of children per family and the ever-increasing participation of women in society, making it indispensable to consolidate measures in view of such changes. The government, nonetheless, has always aimed to enhance policies to promote child welfare. In addition, recently, father's involvement in child caring was officially recommended.

Children are the most vulnerable individuals in society. They are also the most precious commodity that the world has and have a right to be protected from all forms of abuse. The sexual abuse of children by adults to satisfy their own perversions is a global problem. It has always taken place, and with modern methods of travel and communication, and since the introduction of the Internet, it is now possible to network child pornography exchange and information in vast quantities and in very short periods of time. In 1989, the United Nations Convention on the Rights of the Child passed the most popular resolution ever, which has now been adopted by more than 190 countries, declaring that all children must be protected from all forms of abuse. In May 1999, a new law was adopted by the Japanese Diet regarding child prostitution, child pornography and sexual abuse committed by Japanese nationals abroad.

Recently, cases in which child abuse assistance is needed are rapidly increasing in Japan. Given the serious effects that child abuse can have on the mental and physical growth of children as well as their character formation, the Child Abuse Protection Law was adopted in May 2000. This law aims to set forth the responsibilities of central and local government agencies for the prohibition and prevention of child abuse as well as measures for the protection of the children involved as a means to prevent such abuse.

② The Children Act 1989 of the United Kingdom of Great Britain

A team based at the University of York reviewed the available data and found that (29): 1) Child poverty in the UK has increased threefold in the last 20 years. 2) Four million children (one in three) live in poverty in the UK. 3) The UK has the highest child poverty rate of any major industrialized country apart from the US. 4) Fifty thousand children (8–10 yrs.) have nothing to eat or drink before going to school in the morning. 5) In the UK, at least one child a week dies of parental abuse or neglect.

Despite these alarming statistics, in global terms, British children are relatively privileged in that very few are seriously malnourished and all go to school. Nonetheless, children in the

UK are not a highly regarded social group. Although the rate of child poverty has increased, the outcomes of child poverty have decreased. Research has shown a definite relationship between child poverty outcomes, such as mortality and birth weight, and children's economic status and ethnicity (29). For example, although the general rate of mortality from accidents has decreased, accidental deaths are still the main cause of child deaths. More importantly, poor children are most likely to die on the roads and from accidents at home. For a long time, children's social well-being has been overlooked by British society. Today, the country is working to improve children's social status by first improving children's lives.

Attempts to protect child welfare began with those concerned with ensuring the child's physical and mental health and safety in the family. For example, children's lives are drastically changed by their parents' divorce cases. As a result of these parental dispute cases, children are often forced to switch schools or be removed from their own homes and placed in foster care. The UK recognizes that children need to be protected in all circumstances and the government has attempted to ensure child welfare through the Children Act 1989.

Thereafter, a unifying legislative document which created a law regarding caring for, bringing up, and protecting children, has greatly affected services for children. The act rests on the belief that children are generally best cared for under the guidance of both parents being fully present. Thus, the concept of parental responsibility is central to the Children Act. In cases in which parents fail to exercise their parental responsibilities, social workers are urged to help parents retain their parental duties and restore the family dynamic. Furthermore, this act, for the first time in English law, attempts to place children in a system which allows for protecting the continuity of family diversity and culture outside the family institution itself. For example, the government encourages social workers to preserve the continuity of schools if children are placed into the foster care system, even if this demands that the social worker arrange transportation for the child. The Children Act 1989 is critical to protecting child welfare in that it considers the importance of school life in the child's intellectual and social development, and recognizes the stability children find in school as opposed to their often unstable family structure.

Evidence collected during the British Government's 2002 review of childcare showed that childcare can make a positive difference to children, parents and communities—helping to tackle child poverty, improve children's achievements at school, enable parents to choose work as a route out of poverty, improve health and reduce crime; that children, parents and communities gain when childcare, early education and health and family support are offered together. There are significant pay-offs in offering these services to disadvantaged young children. The review concluded that: 1) there is a strong case for the government to invest in new, good-quality childcare; 2) existing services should be expanded and should place more emphasis on health and family support; and 3) new investment in childcare services needs to be backed by strengthening the role of local authorities in ensuring delivery.

Based partially on this review, Sure Start (<http://www.surestart.gov.uk>) has been started as a government program

which aims to achieve better outcomes for children, parents and communities by: 1) increasing the availability of childcare for all children; 2) improving the health, education and emotional development of young children; and 3) supporting parents as parents and in their aspirations towards employment.

Children’s early years should be enjoyable and secure, but full of fun and challenge. They are a vital time when children develop rapidly—physically, intellectually, emotionally and socially. Children need the best possible start in life, so they can flourish when they go to school and in later years. To this end, Sure Start’s overall aim is to help provide the best possible start in life for all children. It plays a part in the British government’s ambition to halve child poverty by 2010. It is also a significant contributor to the government’s aim of delivering opportunity and security for all. Sure Start supports families from pregnancy right through until children are 14, including those with special educational needs, and for those with disabilities, up to age 16.

③ Early Head Start Project and Early Childhood Development Programs in the USA

Head Start and Early Head Start are comprehensive child development programs which serve children from birth to age 5, pregnant women, and their families. They are child-focused programs and have the overall goal of increasing the school readiness of young children in low-income families. The Head Start program is administered by the Head Start Bureau, the Administration on Children, Youth and Families (ACYF), the Administration for Children and Families (ACF), and the Department of Health and Human Services (DHHS).

Findings from more than three decades of research in child and family development support the vision and goals set forth for support to families with infants and toddlers. The time from conception to age 3 is recognized as a critical period of human development, as change occurs more rapidly than in any other period of the life span. Growth in these early years establishes the basic foundation for future development. For infants and toddlers to develop optimally, they must have healthy beginnings and the continuity of responsive and caring relationships. Together, these supports help promote optimal cognitive, social, emotional, physical, and language development. When these supports are missing, the immediate and future development of the child may be compromised. The child-caregiver relation-

Table 2 Childcare guideline summarized from The Statement of the Advisory Committee on Services for Families with Infants and Toddlers of the Early Head Start program

- Emotional nourishment
- Skills and Incentives for social turn-taking, Reciprocity and Cooperation
- Initiative and Self-directedness.
- Self-control, Emotional regulation, Negotiation
- Empathy, Pro-social tendencies, Emotions of pride and shame

ships with the mother, father, grandparents and other caregivers are critical for providing infants and toddlers support, engagement, continuity and emotional nourishment necessary for healthy development, and the development of healthy attachments.

The child-caring guideline from The Statement of the Advisory Committee on Services for Families with Infants and Toddlers of the Early Head Start program is summarized in Table 2.

In summary, parental divorce/isolation, and child physical and sexual abuse/neglect, among other adverse factors, appeared to be determinants of healthy development at either the initial or later stages. According to prospective studies, such stressors, especially those occurring until around 3 years of age were associated with later adverse life quality in adulthood. In studies to decrease such adverse effects with socio-medical procedures, preventive pathways will be illustrated to us.

2) Adulthood

As a psychosocial stressor, job strain has raised concerns in adulthood due to its adverse effects on health (30–32). A model identifying stressful components of the workplace, and recent substantial psychosocial stressors, are listed and discussed here. The author focused on prospective cohort studies showing the association between job strain and health status in different countries. In addition, aspects of coping with these psychosocial stressors were discussed.

(1) Psychosocial stressors

① Karasek’s job strain:

In Karasek’s Demand-Control model (33), job strain is conceptualized as the combination of a high degree of workload demands and low decision latitude. Job demands include how fast and how hard one must perform the necessary tasks, the

Table 3 Studies of psychosocial work characteristics and quality of life

Author, year, country	Total sample (% women)	Exposure	Follow-up (years)	Outcome	Summary of results
Stansfeld 1998 UK	10308 (33)	Karasek’s job strain model	3	SF-36	Low job control and low emotional support in men and women and high job demand in women predicted poor physical and psychological functioning
Martikainen 1999, UK	7177 (30)	Job control	3	SF-36	Job control accounted for decline in employment grade differences in mental and physical functioning
Cheng 2000 USA	21290 (100)	Karasek’s job strain model plus social support	4	SF-36	Low job control, high job demands and low work-related social support were associated with poor health at baseline as well as greater functional decline over the follow-up period.
Nasermoaddeli 2003 Japan	1392 (45)	Karasek’s job demand-control model	1	WHO/QOL-BREF	Job control and demand were associated positively and negatively, respectively, in moderate strength with the physical health and psychological domains

hectic nature of the job, whether there is enough time to perform job tasks, the proportion of work performed under time pressure, the amount of work, the level of concentration required, the presence of conflicting demands, and how often tasks are interrupted or work is slowed by having to wait for others. Decision latitude refers to employees' control over their tasks and conduct during the working day. This dimension has two main components: 1) skill discretion (the degree to which the job involves learning new things, lacks repetitiveness, encourages creativity, includes a variety of tasks, and develops the individual's special abilities), and 2) decision authority (the individual's ability to make decisions about his/her own job and to influence the work group).

To show the Karasek model's availability, articles for review were identified by Medline search (1966–2003), and the studies included had a prospective cohort design, which is the best observational design for questions of etiology and prognosis: a population-based sample of the working people.

Table 3 shows prospective cohort studies that have examined the relationship between job strain or its components (job control and demand) and health status. On the basis of these studies (34–37) on the working population, job strain was associated with poor health-related quality of life, which shows that these methods give reasonably consistent results and suggests that they are complementary, regardless of the workplace condition in each research field.

However, there is some debate about whether the job demand dimension predicts health. Several substudies from the Whitehall II study of British civil servants showed that poor health was associated with lower job control but not with high job demands (32, 34, 38).

Job strain has also been shown to relate to a variety of medical conditions, including increased prevalence of premature death from cardiovascular disease (39). Workplace stress can have detrimental personal and professional effects. Burnout is associated with a broad range of negative health symptoms, including physical and emotional exhaustion. This results in a lack of energy and enthusiasm, feelings of depression, frustration, hopelessness, and a sense of entrapment (40, 41).

Job strain has also been associated with sleep problems. We have already presented data regarding the association between higher job strain (high demand, low control) and lower sleep quality in Japanese civil servants (42). Landsbergis (43) also showed a similar association in hospital and nursing home employees in the US.

High job strain was also associated with greater prevalence of major depressive episodes, depressive syndrome and dysphoria in a follow-up interview study in a group of females (but not males) from randomly designated workers (44).

Work characteristics may independently influence functioning and ill health in several different ways. First, there may be direct effects. Positive aspects of work (high levels of control, skill discretion, work support and high reward) and personal social support may increase self-esteem, self-efficiency and perceptions of control over the environment. In turn, these positive psychosocial states may reduce chronic physiological arousal (45) and boost immune responsiveness (46). This may lead to good health and functioning and greater resistance to the

impact of life events and chronic stressors on health. However, lack of these positive environmental characteristics and, in addition, the presence of negative aspects of work (high job demand) and negative characteristics of close inter-human relationships may increase physiological arousal either through activation of the hypothalamic-pituitary-adrenal axis or through the hormones (47). In both cases, there may be chronic metabolic disturbance that may eventually lead to the development of impaired functioning and disease.

Secondly, there may be indirect effects. For example, positive aspects of work and support may encourage the individual to adopt healthy behaviors, such as healthy eating and exercise, whereas negative aspects of work and inter-human relationships may mean that the individual seeks solace in smoking or over-eating (48). Thus, any effects on health or functioning might be mediated through these health-related behaviors.

An important issue concerns the validity and reliability of self-reported measures. Since job strain is assessed by self-reporting, reverse causation should also be taken into consideration as it has been argued that unhealthy or less socially competent people may drift to worse jobs with lower levels of control over decision-making (49). These sources of bias may partially account for the observed associations in these studies and therefore, objective measures are needed to clarify these issues.

If healthy functioning of people in stable jobs is somehow related to being healthy at work, then symptoms of illness or sickness absence indicate some lack of correct functioning, whether the causes are psychosocial or physical. Sickness absence is a composite outcome, comprising health and social behavior. It is primarily a proxy measure of ill health implying reduced occupational functioning and a form of illness behavior leading to withdrawal from work, which may be linked to a wide range of life stressors. Previous reports have indicated that low levels of work demands, control and support were associated with higher rates of short and long spells of sickness absence in men, and to a lesser extent, in women (50). The differences were similar in the self-reports and external assessments.

② Effort-reward imbalance:

Recently research has also focused on other forms of work-related stress. One model views work stress as the outcome of high effort and low reward (51), which has been correlated with progression of carotid atherosclerosis (52). Lack of reciprocity between costs and gains defines a state of emotional distress with a special propensity to autonomic nervous arousal and cardiovascular risk. High efforts were defined by competitiveness and work-related overcommitment, while low rewards were defined by poor promotion prospects or a blocked career. Effort-reward imbalance also predicted lower health functioning in terms of physical and psychosocial health in the longitudinal cohort (34).

The construction of the effort-reward questions may be both a strength and a weakness; they are devised to incorporate both the environmental conditions and the individual's needs and responses to the environment. Thus, the questions tackle the issue of person-environment interactions and take into account potential mismatches between environment and personality that are missed by traditional instruments measuring work. This

potentially makes a more powerful instrument, but has the disadvantage that the individual characteristics, which are part of the measure, may also be linked to the functional outcomes independently of the working environment.

③ Employment grade:

It has already been shown that manual workers have higher mortality rates than non-manual workers (53). Among those in non-manual employment, the lower the social class, the higher the mortality rates (54). The shorter life expectancy among lower socioeconomic groups may be accompanied by a longer period in poor health. Marmot et al. (55) suggested that the use of Registrar-General social classes instead of employment grade might lead to underestimation of the extent of mortality and morbidity differentials. He also considered that employment grade with the civil service, with its strong relation to income, was a more precise classification of socioeconomic position than Registrar-General's social classes, based on occupation. Marmot et al. (55) reported that the differences between grades in self-perceived ill health and in health risk behaviors including smoking, diet and exercise were substantial.

④ Working hours:

Japan seems to have problems with setting standards for an adequate number of working hours. Compared with the number of annual working hours of the manufacturing industry in Western, industrialized countries, the number of hours in Japan are higher. The Japanese worked 300 to nearly 500 hours longer than the Germans and the French in 1997 (56). Sokejima and Kagamimori (57) found a U-shape relationship between the mean working hours and the risk of acute myocardial infarction. Therefore, long working hours in Japanese society should be taken into consideration from a public health point of view. Shimomitsu and Haratani (58) also reported that the percentage of those experiencing occupational stress increased as the actual number of hours worked increased.

According to data from Ministry of Health and Welfare, Japan, the mortality rate due to suicide grew by more than 50% among men in their 50s between 1997 and 1998. It is speculated that the severe economic situation and physical and mental overload are the main reasons for the high suicide rate.

Longer working hours need more metabolic demands. Higher metabolic demands at work (exceeding one-third of a person's aerobic capacity) were characterized in a study by Karlqvist et al. (59) as awkward work posture, heavy manual materials handling, high circulatory strain, noise levels, much routine work, and obstacles to job performance.

(2) Stress coping measures

① Social support:

Low work-related social support (support from coworkers and supervisors) was associated with health functioning decline in two of the cohorts (34, 36). It has been suggested that social support has two major mechanisms of action: either a direct influence on health or a buffering influence on health moderating the impact of psychosocial stressors (60, 61), while there was not enough evidence that personal social support moderates the influence of work characteristics on functioning (34, 62). However, in our sample of Japanese civil servants, work-related social support was not associated with the follow-up health

status (37).

This may be due to some ceiling effects in Japanese society, in which social ties and relationships are still rich.

② Sense of coherence (SOC):

There have been few discussions of the shaping of personality characteristics or coping behaviors assumed to moderate the stressor-strain relationship. Kobasa et al. (63) provided evidence that high life-stress/low illness individuals reported more hardiness (commitment, involvement, internal locus of control and challenge) but only suggested it may have developed in early life. Sense of coherence (SOC) has been proposed as a construct that predicts effective coping measures and good health as a buffer or moderator (64). SOC has been defined as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that is affected by i) Comprehensibility: the stimuli deriving from one's internal and external environments in the course of living are structured, predictable and explicable; ii) Manageability: the resources are available to one to meet the demands posed by these stimuli; and iii) Meaningfulness: these demands are challenges, worthy of investment and engagement.

To moderate the stressor-strain relationship, Caplan (65) included 'coping' and defined it as changes in environmental mastery or adaptation ability. In our study on Japanese civil servants, the stress-coping measure of higher SOC positively predicted better quality of life (37). Furthermore, we showed that higher SOC could also reduce the likelihood of long spells of sickness absence in men (66).

This indicates that those subjects who see their life as having some purpose and believe that their life tasks are worthy investments, in terms of energy and commitment, as well as seeing themselves as having the personal resources to cope with the difficulties and demands that they may encounter, have better quality of life. Suominen et al. (67) also reported from a longitudinal study on a random Finnish sample that the initial level of SOC was significantly associated with the subjective state of health four years later when adjustment was made for the initial subjective state of health.

A strong SOC alone or together with sufficient and appropriately coordinated resources might lighten the burden of life by diminishing experiences of overwhelming and, therefore, negative stress. A low SOC does not, by definition, imply a depressive mood, but it has been associated with depression in empirical studies (68). For this reason, it should be considered whether, in fact, the present findings are spurious, exclusively reflecting the operation of depression. Kivimaki et al. (69) reported that such a bias is not likely since they found a stronger effect of low SOC on poor health than that of depressive symptoms.

The strength of one's SOC is shaped by three kinds of life experiences: consistency, underload-overload balance and participation in socially valued decision-making (64), therefore, measures which are assumed to enhance an individual's SOC, such as participating in social activities, could also improve the status of well-being from a health promotion point of view. Some reports have even suggested that improving exercise habits could enhance natural killer cell activity through increased SOC in Japanese male office workers who never smoked cigarettes (70).

③ Type A behavior pattern:

Previously, the relationship between the Type A behavior pattern and a variety of organizationally relevant variables was frequently addressed in the literature. As an example, Baron et al. (71) showed that the higher individuals score on a measure of the Type A behavior pattern, the greater their reported frequency of engaging in various forms of workplace aggression. Type A behavior is an action-emotion construct originally formulated and described by Friedman and Rosenman (72). The individual exhibiting Type A behavior is characterized in part as being extremely hard-driving and competitive, highly achievement-oriented and work-involved, and engrossed in a chronic struggle to accomplish more and more in less and less time. There have been reports that Type A Japanese males perceived a lower subjective stress level (73), and that working more than 10 hours per day was a significant predictor of job satisfaction among Type A white-collar Japanese workers (74), which suggests better handling of stress in Type A individuals.

Behavioral characteristics could interact with Type A behavior in predicting health status. Sumi et al. (75) reported a significant interaction of scores on optimism and Type A behavior in Japanese women; those who reported higher optimism and a higher Type A behavior score had a lower mean for anxiety than those who reported lower optimism and a higher Type A behavior score, while no differences were found between those having low Type A score with higher and lower optimism.

In summary, management of stress at the workplace could improve the health and well-being of employees and therefore increase the productivity of the organization. Management of job stress can be viewed from two aspects: A) From the work view-point: Job redesign by introducing either implemental or emotional support to the employees. B) From the individual's viewpoint: Changing the lifestyle patterns in order to manipulate the coping ability of the employees in facing job strain. Studies on the association between such managements to job stress and health will provide knowledge for preventive medicine to working people.

3) Elderly status

Previous research has already indicated that low levels of social support increase the risk of not only ill health but also mortality, especially for the elderly. Unless there is enough social support, psychosocial stressors among the elderly could decrease their resistance to pathogenic agents. On the other hand, social support appears to promote health and protect the elderly against diseases and death.

(1) Later-life psychosocial stressors

① Retirement

Retirement is the most anticipated event in later life. Changes in financial matters, social and individual roles, relationships, self-esteem, use of time, etc., follow retirement. However, many people are not prepared for these changes. For instance, Vinick and Ekaerd (76) emphasized the need for pre-retired people to assess their current lifestyles and plan for life after retirement. This is mostly the case for women. Although many women expect that they will be cared for in later life, and have a fear of growing old, many do not plan aggressively for

retirement (77). Since retirement is likely to relate to a sort of social isolation from implemental and spiritual aspects, it is a complex risk factor for morbidity at the initial stage of elderly status. Therefore, social support should be concerned with life after retirement. Field and Minkler (78) examined the continuity and change in social support in a sample of old-old (74–84 years) or very-old (85 and over) participants. They focused on network disruptions resulting from such stresses as retirement, relocation, etc. Considerable continuity in the extent of contact with family relationships for the whole group was found. There were differences among age groups or genders in involvement with family. In beyond-family or friend contacts, declines were observed for men but not for women, and for the very-old but not for the old-old. For both genders, but particularly among the men, there was a significant decline in more intimate, one-to-one activities, in favor of group activities. Among the men, however, they observed a significant decline in the importance of friendship, while no change appeared for women. Attendance at clubs and participation in other organizations remained high. The study demonstrated relationships within the family to remain relatively stable in old age, and changes to tend to involve supportive ties beyond the family or friends.

Rosenkoetter and Carris (79) have demonstrated four factors of problem adjustment areas identified by the factor analysis based on a retiree population survey on psychosocial status after retirement: (i) satisfaction with retirement, (ii) retirement concerns, (iii) spousal relationship, and (iv) pre-retirement preparation outcomes.

Strategies on such adjustment factors in retirement are important in preventing not only physical but also psychosocial health problems in the elderly.

② Caring for the elderly

In an advancing-age society, the number of elderly who need care due to morbidity and disability will increase. According to previous research on caregiving, in contrast to positive experiences such as feeling of mutuality, gratification and finding meaning in the care, negative experiences such as burden, strain, depression and health deterioration were predominantly reported by caregivers. These psychosocial stressors influenced the caregivers' health and lifestyle including rest, sleep, leisure time and social connection, and the continuation of caregiving at home (80, 81).

Recently, Kesselring et al. (82) analyzed caregiving conditions as independent variables to caregiver burden, tolerance ratio, mutuality and closeness as dependent variables in home care to the elderly. According to predictive models, contributors to variance were for burden (35%); impact of care on caregivers' mental health, social relations and leisure time, patients' gender, accumulation of patients' symptoms and behaviors, for caregivers' tolerance toward patients' symptoms and behaviors (17%); caregivers' physical health, patients' level of confusion, feelings of mutuality, for mutuality (22%), and for closeness (19%); caregivers' mental health, and patients' accumulation of symptoms and behaviors.

With the aging of the population, the number of frail and incapacitated elderly performing as caregivers is increasing. In addition, since social burden for caregiving of patients with dementia is substantially appearing in aging society, this setting

of caregiving for the elderly poses the most extreme challenges to the caregiver (83). So far, results of caring for patients with Alzheimer’s disease or a related disorder have suggested that across most indicators of mental and physical health, caregivers were more depressed, and expressed higher prevalence of chronic diseases such as diabetes, arthritis, ulcer, anemia, etc. (84).

In terms of caregiver’s burdens of caregiving in home, family relationships, economy burden, secondary caregiver, professional consultation, and physical functioning, the mental health and pain of caregivers have been observed to be independently associated (85).

Comprehensive home care policies are clearly needed to prevent deterioration of caregivers’ health and break-down of family structures, and to maintain autonomy and optimal quality of life for the patient and family (86).

③ Spousal bereavement

Many studies have systematically assessed the response to

loss in older adults. Gorer (87) has already argued that mourners typically pass through three stages: (i) a short period of shock, usually lasting from death until the disposal of the body; (ii) a period of intense mourning accompanied by withdrawal of attention and effects from the external world and by physiological changes like disturbed sleep, vivid dreams, failure of appetite and loss of weight; and (iii) a final period of re-established social and physical homeostasis, with sleep and weight stabilized and interest again directed outwards.

Concerning psychosocial mechanisms, these are commonly suggested: (i) emotional stress caused by bereavement, which is a major stressful life event, could have an effect on health, (ii) loss of social support maintained by the deceased spouse, and (iii) loss of material or task support. These changes may be associated with a fall in income or loss of care and support in daily life, which can easily cause ill health among bereaved elderly.

As health consequences, the effects of loss on mortality,

Table 4 Effects of bereavement on health

Concerns	Findings	Authors
Mortality	<ul style="list-style-type: none"> • Greater excess risk compared with non-bereaved control • Higher mortality rates for widowers than for widows • A peak risk period in the first few months following loss • Greater vulnerability of suicide death in men 	Jones DR ⁸⁹⁾ (1987) Martikainen P & Volkonen T ⁹¹⁾ (1996) Cox PR et al. ⁹²⁾ (1964), Kaprio J et al. ⁹⁰⁾ (1987) Li G ⁹³⁾ (1995)
Mental	<ul style="list-style-type: none"> • Delayed recovery from grief, and greater emotional deterioration in men • Effective grief resolution leads to higher hope • Cognitive processing/disclosure increases natural killer cell activity • Increase in psychiatric morbidity after sudden unexpected bereavement 	Hitomi H et al. ⁹⁶⁾ (2000), Lund D et al. ⁹⁷⁾ (1986) Herth K ⁹⁸⁾ (1990) Bower J et al. ⁹⁹⁾ (2003) Lundin T ⁹⁴⁾ (1984)
Physical	<ul style="list-style-type: none"> • Accelerating or exacerbating a preexisting health problem • Excess risk for chronic ischemic heart disease rather than acute disease • Minimal long-term effects on physical health • More medical problems in widowers 	Parkes CM et al. ¹⁰¹⁾ (1969), Mellstrom D et al. ⁸⁸⁾ (1982) Martikainen P & Volkonen T ⁹¹⁾ (1996) Murrell SA et al. ¹⁰³⁾ (1988) Gerber I et al. ¹⁰²⁾ (1975)
Socio-behavioral aspects	<ul style="list-style-type: none"> • Increase in stress-alleviating behaviors (Especially drinking & smoking) • Women likely to be widowed and to live alone • More unfavorable lifestyles of the widowed • The social isolation of bereaved men 	Martikainen P & Valkonen T ¹⁰⁵⁾ (1996) U.S. Bureau of the Census ¹⁰⁴⁾ (1982) Umezaki K et al. ¹⁰⁶⁾ (2003) Berardo ¹⁰⁷⁾ (1970)

Table 5 Mortality (per 10⁵) among the elderly after a spouse death by causes of death: (); ratio, coupled=1.0

		Men				Women			
		65–69 y	70–74 y	75–79 y	80 y~	65–69 y	70–74 y	75–79 y	80 y~
All causes	Coupled	2362 (1.0)	4058 (1.0)	6934 (1.0)	12681 (1.0)	1173 (1.0)	2131 (1.0)	4030 (1.0)	7446 (1.0)
	Bereaved	3484 (1.5)	5488 (1.4)	9161 (1.3)	17705 (1.4)	1451 (1.2)	2633 (1.2)	4920 (1.2)	12441 (1.7)
All cancer	Coupled	833 (1.0)	1210 (1.0)	1575 (1.0)	1747 (1.0)	385 (1.0)	556 (1.0)	746 (1.0)	803 (1.0)
	Bereaved	961 (1.2)	1376 (1.1)	1789 (1.1)	1864 (1.1)	444 (1.2)	634 (1.1)	827 (1.1)	950 (1.2)
Stroke	Coupled	506 (1.0)	981 (1.0)	1920 (1.0)	3376 (1.0)	281 (1.0)	592 (1.0)	1261 (1.0)	2290 (1.0)
	Bereaved	783 (1.5)	1410 (1.4)	2438 (1.3)	4465 (1.3)	358 (1.3)	714 (1.2)	1495 (1.2)	3414 (1.5)
Ischemic heart disease	Coupled	188 (1.0)	338 (1.0)	549 (1.0)	959 (1.0)	88 (1.0)	178 (1.0)	341 (1.0)	579 (1.0)
	Bereaved	285 (1.5)	438 (1.3)	738 (1.3)	1256 (1.3)	102 (1.2)	214 (1.2)	408 (1.2)	862 (1.5)
Suicide	Coupled	29 (1.0)	37 (1.0)	44 (1.0)	50 (1.0)	24 (1.0)	32 (1.0)	38 (1.0)	35 (1.0)
	Bereaved	82 (2.8)	107 (2.9)	111 (2.5)	138 (2.8)	37 (1.5)	47 (1.5)	62 (1.6)	69 (2.0)
Accidents	Coupled	70 (1.0)	96 (1.0)	117 (1.0)	188 (1.0)	21 (1.0)	36 (1.0)	60 (1.0)	88 (1.0)
	Bereaved	131 (1.9)	139 (1.4)	194 (1.7)	280 (1.5)	26 (1.2)	47 (1.3)	79 (1.3)	175 (2.0)

mental health, physical health, and socio-behavioral aspects were focused on, and are summarized in Table 4.

With regard to mortality, in general, the findings (89–93) have been remarkably consistent; the risk among the widowed exceeds that among married persons, and is also higher for widowers than for widows by either cross-sectional or follow-up studies. Furthermore, follow-up studies have shown the mortality rates of the widowed are higher during the first six months of bereavement than those for the married, and this increase gradually fell thereafter to the level of the control. In Japan, the Ministry of Health and Welfare (issued in 1983) published formal data on differences in mortality rates by marital status, as shown in Table 5, in which all specific causes were stronger for the widowed, with the greatest risk being suicide. Gender differences, especially for suicide mortality rates, were widely recognized (93).

With regard to mental health, emotional preparation is supposed to moderate the intensity of grief after the bereavement or enhance the ability to cope with it. Therefore, the survivor might be less vulnerable to psychological reaction than physical reaction. In addition, the elderly who are bereaved because of a chronic illness death should adjust better emotionally than those with sudden death.

In fact, an increase in psychiatric morbidity after sudden or unexpected bereavement has been observed (94). On the other hand, Clayton et al. (95) found among the elderly, that, when there is a comparatively short chronic illness death, the bereaved did not differ in psychological adjustment from those whose loss was related to a longer-term fatal illness.

Furthermore, gender differences in recovery from bereavement have often been reported (95–97). Some intervention studies have indicated mental care for the bereaved was in favor of recovery from grief; Herth (98) for effective grief resolution to higher hope, and Bower et al. (99) for cognitive processing/disclosure of grief to enhancement in natural killer cell cytotoxicity. However, Scruby and Sloan (100) proposed that further work is required regarding the timing of bereavement intervention and tool development for the bereaved population because bereavement counseling is not necessarily effective in improving satisfaction, frustration and synthesis.

With regard to physical health, bereavement may affect the endocrine system, and lead to changes in the immune, autonomic nervous and cardiovascular systems, and account for increased vulnerability to external agents as a health consequence of spouse death. These responses could be related to the acceleration or exacerbation of a preexisting health problem (101). Regarding common diseases, for instance, an excess risk for chronic ischemic heart disease rather than acute disease was observed in relation to bereavement (91). After spousal death, while widowers have more medical problems (102), long-term effects on physical health were demonstrated to be the most minimal (103).

With regard to socio-behavioral aspects, because most of the widowed are women, the majority of this field has focused on women. For instance, according to the US. Bureau of the Census (104), more than 50% of all women 65 years and over and 12% of all men that age have become widowed. Social and economic difficulties are associated with spouse bereavement,

and a wider range of social problems confronts widows after the loss of their husbands. They are likely to remain withdrawn, and to cut social ties. These settings might lead to an increase in stress-alleviating behaviors including drinking and smoking (105). Furthermore, bereaved elderly women are more likely to show irregular meal patterns, physical inactivity, and sleeplessness compared to the non-bereaved (106).

On the other hand, as Berardo (107) emphasized, elderly widowers might be less capable of caring for themselves, and might have developed fewer social networks, which could worsen their quality of life. Therefore, bereavement studies should also draw attention to the social isolation of widowers.

(2) Coping strategy

As pointed out earlier in articles of psychosocial stressors in adulthood, social support is an important factor in the coping process. Since supportive relationships can be sources of information and problem-solving skills, they can have a positive effect on the course of any psychosocial strain as well as increase the likelihood that the individual will return to effective functioning. On the other hand, lack of social support is thought to be a stronger predictor of psychological distress than a supportive relationship (108). The preceding analyses have shown that social and community ties are associated with risk of mortality independently of the self-reported physical health status at the baseline survey, year of death, socioeconomic status, and health items such as smoking, alcoholic consumption, obesity, physical activity, and utilization of preventive health services as well as a cumulative index of health practice. Concerning these ties, four sources of social relationships, marriage, making contacts with close friends or relatives, church membership and informal and formal group associations were examined. In each instance, people with social ties and relationships had lower mortality rates than people without such ties. Each of the four sources was found to predict mortality independently of the other three; the more intimate ties of marriage and contact with friends and relatives were stronger predictors than were ties of church and group membership (109). In general, low levels of social network and social support increased the risk of mortality, especially for elderly men (110). Hanson et al. (111) reported from a follow-up study that a higher mortality risk was found among elderly men with low availability of emotional support and low adequacy of social participation and among those living alone, after adjustments for social class, health status at baseline, cardiovascular risk factors, alcohol intake, physical activity, and body mass index.

These articles demonstrated that only a part of the association between social network and social support, and mortality in later life is mediated through lifestyle and disease-specific risk factors. In the later-life stage, social support can preserve well-being against psychosocial stressors such as retirement, caring for the elderly and spouse bereavement. Nevertheless, for some elderly, each of these psychosocial stressors could be a stimulus to social participation, for instance, informal relationships with neighbors. In fact, the number of social contacts has been observed to increase rather than decrease during bereavement (112).

In summary, in the aging society, isolation associated with

later-life events increases, hence, studies on the health effects from the stand point of preventive medicine could provide evidence-based supportive care to the elderly.

3. Conclusion

Recently, the attention has moved away from “one psychosocial factor affects health” to a broader view of “the interactions of psychosocial factors affect health”.

The psychosocial stressors mentioned above may not by themselves have any direct effects on disease processes. These risk factors affect disease processes via two biobehavioral pathways: 1) unhealthy behaviors like smoking, increased caloric intake, increased alcohol intake (113, 114) and 2) biological characteristics like increased cardiovascular/neuroendocrine reactivity to stress (115) or increased inflammatory cytokines (116).

There is probably no single biobehavioral pathway whereby psychosocial factors always influence the development and course of major diseases. A more accurate conceptualization may be one that considers as an influence gene-environment interaction, which among the many potential biobehavioral pathways link psychosocial factors with disease processes. It is worth noting that since the well-being of individuals may be affected by other variables including diet, material problems, life events, etc., the reviewed articles which focused mainly on

psychosocial characteristics only partially illustrate the factors contributing to changes in health status in the period of the studies.

This review article, as a complementary report, views the strong association between psychosocial stressors, health, and social support as a preventive strategy, from different aspects. These findings, which are probably etiological, are independent of baseline functioning and seem to be similar in different cultural backgrounds. This systematic review should be updated and expanded to include other observational and interventional study designs and other endpoints in order to focus future research and policy.

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