Relationship between Social Support, Mental Health and Health Care Consciousness in Developing the Industrial Health Education of Male Employees

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Abstract: Relationship between Social Support, Mental Health and Health Care Consciousness in Developing the Industrial Health Education of Male Employees: Daisuke Fujita, et al. Faculty of Human Development, Kobe University—The purpose of the study is to elucidate the relationship between social support, health care consciousness and mental health in developing the industrial health education aimed at improving the health habits of male employees. A questionnaire survey concerning health practices, mental health based on the General Health Questionnaire, social support from social support networks, and health care consciousness based on the Health Locus of Control was conducted on male employees in three companies in Osaka Prefecture. A total of 1634 questionnaires were collected. Analyses by age group showed that in all age groups, the higher the social support score, the more favorable the mental health became and the stronger the family care in health care consciousness became. The better the mental health, the greater the number of good health practices was and the lower the fortune dependence in health care consciousness tended to be. The results of the study reconfirm the previous findings that it is necessary to put the mental health of male employees in good condition before everything else in effectively developing health education aimed at improving their health habits. This study also indicates that the level of perception of social support and their internal control of self and family in health care consciousness are definitely related to the stability of subjects' mental health. It is therefore presumed that measures to raise the level of perception of social support are important since they may improve the mental health of subjects.

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Key words: Male employee, Health practices, Mental health, Social support, Health Locus of Control, Health education

Since studies by Breslow¹, ²) and other investigators, who indicated that good health practices might improve the health status of people, a number of measures have been taken to improve the lifestyle in communities, schools and offices in Japan also. Nevertheless improvement of the lifestyle has taken place very slowly, and more effective approaches in health education are being investigated³).

It has already been reported that health practices are related to mental health in workers: the better their mental health, the greater the number of health practices they have⁴, ⁵). It is therefore suggested that implementing mental health measures by counseling may play an important role in enhancing the effect of industrial health education aimed at facilitating the formation and improvement of health habits of workers. That is, to develop industrial health education effectively to facilitate the formation and improvement of health habits in the workplace, stabilization of the mental health of subjects is considered necessary for keeping the education environment in good condition. To enable the counseling system to form and improve the health habits of workers, it is considered necessary to not only take measures to improve mental health, covering mainly human relations, of workers in the workplace, but also to investigate the personal environment, especially the support environment, including the family, and the individual consciousness of health promotion. Thus, in preparing the environment of psychological education such as stabilization of individual mental health, it is necessary to make clear the level of perception of the social support provided by families and friends and the consciousness of health care and to investigate the relationship of the social support and consciousness of health care to the stabilization the mental health of the individual.
The effects of social support on the maintenance and promotion of health have been investigated in mortality, ischemic heart disease, diabetes, cerebrovascular disorders, peptic ulcer, and depression. A number of papers have reported that the higher the level of perception of social support provided by families and friends, the less the stress due to disease, leading to good results in secondary and tertiary prevention of the progress and prognosis of symptoms. Nevertheless, the effects of the level of perception of social support on the positive attitude of individuals toward health promotion as primary prevention have not yet been elucidated.

In this study, the relationship between health practices and health care consciousness was investigated on the basis of the Health Locus of Control (HLC) in Rotter’s social learning theory. According to this conception of HLC, internal control in HLC means that the health status is maintained and promoted by one’s own efforts and daily attention. It is considered that the person with stronger internal control has stronger subjective self-care consciousness in health care. But some authors reported that persons with stronger internal control did health-promoting practices more positively, whereas others reported that there was no relation between internal control and health-promoting behavior. No definite conclusion has yet been arrived at on the relationship between health practices and HLC.

In light of the Japanese version of the five-factor Health Locus of Control Scales reported by Horike, five items on each of the four subscales “self”, “family”, “medicine”, and “fortune” were questioned with the four-category system (“Think very much”, “Think a little”, “Think little”, and “Think not at all”). For scoring, 0 to 3 points were given according to the content of choices. The total score for each subscale was counted and regarded as the “self-care score”, “family care score”, “medicine dependence score”, or “fortune dependence score”. The reliability coefficient (Cronbach’s α) for this scale as a whole in this survey was 0.825. The α coefficients for the four subscales “self”, “family”, “medicine”, and “fortune” were 0.864, 0.902, 0.814 and 0.883, respectively. All of these four subscales or a total of 20 items were subjected to a factor analysis by means of principal component analysis to verify the adequacy of component items of the scale in this survey. Four factors were extracted and their cumulative proportion was 66.3%. The first factor consisted of five “family” items, accounting for 26.0% of variance, the second factor consisted of five “fortune” items, accounting for 19.4%, the third factor consisted of five “self” items, accounting for 11.0%, and

Subjects and Methods
The study was performed on all employees working at three general enterprises (machine, transport machine, and textile) or their related companies in Osaka Prefecture, who consented to participating in the study. In this report, the first part of the study, male employees were included in analyses.

A signed self-administered questionnaire entitled “Survey on Health Practices and Health Consciousness” was constructed. Questionnaires were distributed and collected by internal mail, etc. in November and December, 1998. The questionnaire consisted of questions about health practices, health care consciousness, mental health and social support. Among “seven health practices” reported by Berkman and Breslow, five health practices (hours of sleep, regularity of exercise, moderate alcohol consumption, smoking abstinence, and appropriate body weight) which were specially related to health status were surveyed. The appropriate body weight was defined as a body mass index (BMI) of “18.5 to less than 25.0” according to the Japan Society for the Study of Obesity criteria. BMI was calculated from the height and weight at a regular physical examination. Answers “7–8 h on the average” for sleeping, “do exercise regularly” for exercise, “have two or more alcohol holidays/wk” for drinking, and “have never smoked or have been off cigarettes” for smoking were regarded as good health practices. The total number of good practices among the five health practices was determined and regarded as the health practice score.

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the fourth factor consisted of five “medicine” items, accounting for 9.9%.

For mental health, the Japanese version of the 12-item General Health Questionnaire (GHQ) the validity of which was assessed by Fukunishi was used. Scoring was done by using the GHQ scoring method (0–0–1–1) and the total score was used a mental health score. The reliability coefficient (Cronbach’s $\alpha$) for this scale was 0.884.

Regarding social support, the “support network” scale consisting of “emotional support network (8 items)” and “instrumental support network (5 items)” as reported by Munakata was used. A total of 13 questions were scored according to the method of scoring proposed for each question and the total score was regarded as a social support score. The reliability coefficient (Cronbach’s $\alpha$) for this scale in this survey was 0.906.

For statistical analyses, the subjects were classified by age into four groups (29 and under, 30 to 39, 40 to 49, and 50 and over). The relationship between health practices and the age group was analyzed by the $\chi^2$ test.

The relationships between social support, each of four HLC scores and mental health and the age group were analyzed by the one-way analysis of variance. The correlation coefficients for the relationships among the four items studied (number of health practices, social support score, four HLC factors, mental health) were determined in each age group. For determining the association of social support score with four HLC factors and mental health, stepwise multiple regression analysis was performed with mental health as an independent variable. In addition, the social support score was subjected to two-way analysis of variance taking the age group and the presence of a family to live with as variables. These analyses were performed with SPSS 10.0J for Windows. The level of significance was 0.05.

Results

1. Age, marital status and occupation of respondents

Usable questionnaires were received from 1,634 persons. The response rate was about 70%. The respondents ranged in age from 18 to 65 yr, with the mean ± standard deviation (SD) being 37.5 ±10.6 yr. For data analysis, they were classified into four age groups: “29-and-under” age group, “30–39” age group, “40–49” age group, and “50-and-over” age group. The number of respondents was 482 in the “29-and-under” age group, 400 in the “30–39” age group, 492 in the “40–49” age group, and 260 in the “50-and-over” age group.

By marital status, there were 1,187 married persons and 447 unmarried persons, 72.6% of the respondents being married. 1,318 respondents (81.0%) lived with their families and 310 respondents lived singly.

By occupation, 706 persons (47.6%), the greatest percentage of the respondents, were blue-collar workers, 376 designers/research workers (25.4%), 319 office workers (21.5%), and 82 in management (5.5%) in decreasing order.

2. Five health practices

The percentages of good health practices were compared among the age groups for the five lifestyle patterns surveyed (hours of sleep, exercise, drinking, smoking, and body weight). The results are shown in Table 1. With regard to hours of sleep, the percentage of persons who answered that they had “an average of 7 h or more of sleep” increased with increasing age. Regarding physical exercise, the percentage of persons who answered that they did “regular exercise” for health increased with increasing age. As to the habit of drinking, however, the percentage of persons who answered that they did “not drink daily” decreased with increasing age as opposed to the sleep and exercise patterns. As to the habit of smoking, the percentage of persons who answered that they “had never smoked or had been off cigarettes” was about 40% in each age group. There was no significant association between the smoking habit and the age group. The percentage of persons in the appropriate body weight range with a BMI of “18.5 to less than 25.0” was about 70% in each age group. There was no significant association between body weight and the age group.

The mean total number of good health practices out of the five health habits was $2.3 \pm 1.1$ (SD) for all respondents. By age group, the corresponding figures were $2.4 \pm 1.0$ in the “29-and-under” age group, $2.2 \pm$
1.1 in the “30–39” age group, 2.3 ± 1.1 in the “40–49” age group, and 2.3 ± 1.1 in the “50-and-over” age group. No significant difference was found in the mean number of “good health practices” among the age groups (F=1.007, not significant).

3. Mental health
The mean score ± SD of “mental health” based on the 12-item version of GHQ was 5.1 ± 3.8 for all respondents. As shown in Table 2, the “mental health” score was higher in the “29-and-under” and “30–39” age groups and lower in the “50-and-over” age group. The mental health status was favorable in the “50-and-over” age group.

4. Social support
The mean score ± SD of “social support” on the support network scale was 7.7 ± 4.3 for all respondents. As shown in Table 2, the mean “social support” score was the lowest in the “40–49” age group. A significant difference was found in the “social support” score among the age groups (F=4.473, p<0.01).

5. Health care consciousness
The mean score ± SD of four health care items on the HLC scale for all respondents was 11.1 ± 2.6 for “self-care,” 10.3 ± 2.8 for “family care”, 7.6 ± 2.6 for “medicine dependence” and 5.4 ± 3.1 for “fortune dependence”. As shown in Table 3, the “self-care score” tended to increase with age. The “family care score” was lower in the “29-and-under” age group and higher in the “30–39” and “50-and-over” age groups, age-related differences being found. The “medicine dependence score” was the lowest in the “29-and-under” age group and tended to increase with age. However, no age-related difference was found in “fortune dependence score”.

6. Relationship between health practices and mental health
The Pearson product-moment correlation coefficient for the association between the mental health score and the number of health practices was calculated for each age group. As shown in Fig. 2, the correlation coefficient r=−0.116 (p<0.05) in the “29-and-under” age group, r=−0.164 (p<0.01) in the “30–39” age group, r=−0.109 (p<0.05) in the “40–49” age group, and r= 0.162 (p<0.05) in the “50-and-over” age group. In each age group, the lower the “mental health” score was, i.e., the more favorable the mental health status was, the greater the number of good health practices was. However, no significant relation was found between social support and health habits or between health care consciousness and health habits.

### Table 2. Mental health (GHQ-12) score and Social support score

<table>
<thead>
<tr>
<th>Age Group</th>
<th>29-and-under</th>
<th>30–39</th>
<th>40–49</th>
<th>50-and-over</th>
<th>F value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health</td>
<td>5.5 ± 3.7</td>
<td>5.6 ± 3.7</td>
<td>5.0 ± 3.8</td>
<td>3.6 ± 3.5</td>
<td>16.936**</td>
</tr>
<tr>
<td>Social support</td>
<td>8.1 ± 4.2</td>
<td>7.8 ± 4.4</td>
<td>7.1 ± 4.4</td>
<td>7.8 ± 4.2</td>
<td>4.473**</td>
</tr>
</tbody>
</table>

(Mean ± SD) (**: p<0.01)

### Table 3. Score for four HLC factors

<table>
<thead>
<tr>
<th>Age Group</th>
<th>29-and-under</th>
<th>30–39</th>
<th>40–49</th>
<th>50-and-over</th>
<th>F value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-care</td>
<td>10.8 ± 2.9</td>
<td>11.2 ± 2.5</td>
<td>11.2 ± 2.5</td>
<td>11.6 ± 2.5</td>
<td>4.363**</td>
</tr>
<tr>
<td>Family care</td>
<td>9.9 ± 2.9</td>
<td>10.6 ± 2.7</td>
<td>10.4 ± 2.7</td>
<td>10.6 ± 2.7</td>
<td>5.008**</td>
</tr>
<tr>
<td>Medicine dependence</td>
<td>7.4 ± 2.9</td>
<td>7.3 ± 2.6</td>
<td>7.8 ± 2.4</td>
<td>8.2 ± 2.6</td>
<td>7.663**</td>
</tr>
<tr>
<td>Fortune dependence</td>
<td>5.3 ± 3.3</td>
<td>5.7 ± 3.0</td>
<td>5.3 ± 3.0</td>
<td>5.6 ± 3.0</td>
<td>1.377</td>
</tr>
</tbody>
</table>

(Mean ± SD) (**: p<0.01)

[Fig. 2. Relationships between social support, health practices and mental health.]
7. Relationships between social support and mental health and between health care consciousness and mental health

The relationship between social support and mental health is also shown in Fig. 2. The correlation coefficient was $r = -0.218$ ($p < 0.001$) in the “29-and-under” age group, $r = -0.214$ ($p < 0.001$) in the “30–39” age group, $r = -0.121$ ($p < 0.01$) in the “40–49” age group, and $r = -0.166$ ($p < 0.05$) in the “50-and-over” age group. In each age group, the lower the “mental health” score was, i.e., the more favorable the mental health status, the higher the social support score was.

Fig. 3 shows the relationship between the scores for HLC factors and the mental health score. An association was found between the “future dependence” score and the mental health score ($r = 0.160$, $p < 0.01$) in the “29-and-under” age group but no association was found between the scores for four HLC factors and the mental health score in the “30–39” age group. But in the “40–49” age group ($r = 0.176$, $p < 0.001$) and the “50-and-over” age group ($r = 0.135$, $p < 0.05$), as in the “29-and-under” age group, an association was found only between the “fortune dependence” score and the mental health score. The higher the “fortune dependence” score, the higher the “mental health” score was, i.e., the less favorable the mental health status was.

The relationships between social support and HLC factors are shown in Fig. 4. Significant associations were found between the “social support” score and the “self-care” and “family-care” scores ($r = 0.160$, $p < 0.01$ for self-care, $r = 0.318$, $p < 0.001$ for family care) in the “29-and-under” age group. These associations were observed in all other age groups. The coefficients of correlation between the “social support” score and the “self-care” score and between the “social support” score and the “family care” score were $r = 0.161$ ($p < 0.01$) and $r = 0.262$ ($p < 0.001$), respectively, in the “30–39” age group. The corresponding coefficients were $r = 0.166$ ($p < 0.001$) and $r = 0.263$ ($p < 0.001$), respectively, in the “40–49” age group and $r = 0.137$ ($p < 0.05$) and $r = 0.210$ ($p < 0.01$), respectively, in the “50-and-over” age group.

To investigate the effects of the social support score and four HLC scores on mental health, stepwise multiple regression analysis was done for each age group taking mental health as a dependent variable and the social support score and four HLC scores as independent variables. As shown in Table 4, the exploratory variables of mental health selected were the social support and fortune dependence scores in the “29-and-under” age group, the social support score in the “30–39” age group, the social support and fortune dependence scores in the “40–49” age group, and the social support score in the “50-and-over” age group. The standardized regression coefficients obtained by this analysis suggest that social support may be effective in stabilizing mental health in all age groups.

8. Social support score by the presence or absence of families to live with

By age group, the percentage of persons who lived with their families was 74.2% (357/481) in the “29-and-under” age group, 86.4% (344/398) in the “30–39” age group, 82.9% (406/490) in the “40–49” age group, and 81.5% (211/259) in the “50-and-over” age group. Two-way analysis of variance was performed with mental health, social support and four mental health consciousness scores being taken as independent variables to examine the main effects for age group and living with family and the interaction effect. No significant difference was found in the mean social support score between age groups. But a main effect of living with the family was observed and the mean social support score was significantly higher for the persons living with their
Discussion

The GHQ used in this survey as a measure of mental health is a scale developed by Goldberg as a screening test for non-organic, non-psychiatric mental disorders. Its Japanese version has been prepared by Nakagawa, et al.24 and its validity and reliability have been verified. Several versions of GHQ consisting of different numbers of questions have been prepared. In the present survey, a 12-item version of GHQ (GHQ-12) consisting of the smallest number of questions was used. Mental health measured by means of the GHQ-12 based on the cut-off point of 2/3 proposed in a previous study22 was generally in an unfavorable condition but improved with age in our subjects. This finding has been reported by other investigators: Irie, et al.5 reported that high scorers having 3 points or more accounted for 46.1%, about half the number, in the under-30-yr age group; Iwata, et al.25 reported that the percentage of high scorers decreased with age. Like these reports, the younger population in this study population is supposed to have mental health problems. Our results suggest the need of guidance in improving mental health. Like the report of Irie, et al.5 our survey indicated that the better the mental health, the greater the number of good health practices was in all age groups. This suggests that it is important to start with stabilization of subjects’ mental health in developing health education aimed at improving lifestyle.

Concerning scores for health care consciousness in the Health Locus of Control (HLC), which is an application of Rotter’s social learning theory26 to the health field, the “self-care score” was the highest, followed by “family care score,” “medicine dependence score” and “fortune dependence score” in this order. This shows that our survey population had a strong internal control on the HLC scale. Some of previous studies dealing with HLC reported that persons with stronger internal control took particular preventive health measures12–15 and others reported that no association was found between HLC and preventive health measures16–19. In this survey, no direct relation was found between HLC and the number of health practices as preventive health measures. Regarding the relationship between the scores for four HLC factors and mental health, “fortune dependence” was associated with mental health in all age groups except the “30–39” age group. This indicates that persons with declined mental health regarded their decreased health status as “unfortunate by chance”, having strong external control, but not related to internal control. On the other hand, in all age groups, the higher the social support score, the more favorable the mental health was. In this study, the ability to cope with stress itself was not assessed, but it is assumed that the relationship between the social support score and mental health as shown in this study is consistent with the findings in the stress coping theory formed by Lazarus27 and Rahe28 and in the Demand Control Support Model formed by Johnson29 independently that mentally more stable persons are more ready to perceive the presence of social support.

Referring to the relationships between social support and four HLC factors, demonstrable connections were found between the social support score and the “self-care score” and “family care score” in all age groups. Therefore, significant associations between social support and the “family care score” and the “presence of a family to live with” were observed, as in Rahe’s Stress and Coping Inventory, which was translated into Japanese by Fukunishi et al., “material and spiritual support from

Table 4. Results of multiple regression analysis (stepwise procedure) by age group taking GHQ score as independent variable

<table>
<thead>
<tr>
<th>Age group</th>
<th>Unstandardized coefficient B</th>
<th>SE</th>
<th>Standardized coefficient β</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-age-under (Constant)</td>
<td>6.147</td>
<td>0.464</td>
<td>-0.218</td>
<td>13.227**</td>
</tr>
<tr>
<td>Social support score</td>
<td>-0.194</td>
<td>0.040</td>
<td>-0.218</td>
<td>-4.799**</td>
</tr>
<tr>
<td>Fortune dependence</td>
<td>0.177</td>
<td>0.052</td>
<td>0.156</td>
<td>3.422**</td>
</tr>
<tr>
<td>30–39 (Constant)</td>
<td>6.929</td>
<td>0.385</td>
<td>-0.215</td>
<td>17.997**</td>
</tr>
<tr>
<td>Social support score</td>
<td>-0.182</td>
<td>0.043</td>
<td>-0.215</td>
<td>-4.214**</td>
</tr>
<tr>
<td>Fortune dependence</td>
<td>0.177</td>
<td>0.052</td>
<td>0.156</td>
<td>3.422**</td>
</tr>
<tr>
<td>40–49 (Constant)</td>
<td>4.653</td>
<td>0.457</td>
<td>0.156</td>
<td>10.185**</td>
</tr>
<tr>
<td>Social support score</td>
<td>-0.110</td>
<td>0.041</td>
<td>-0.125</td>
<td>-2.721**</td>
</tr>
<tr>
<td>Fortune dependence</td>
<td>0.233</td>
<td>0.058</td>
<td>0.185</td>
<td>4.023**</td>
</tr>
<tr>
<td>50-and-over (Constant)</td>
<td>4.590</td>
<td>0.461</td>
<td>-0.171</td>
<td>9.954**</td>
</tr>
<tr>
<td>Social support score</td>
<td>-0.138</td>
<td>0.052</td>
<td>-0.171</td>
<td>-2.628**</td>
</tr>
</tbody>
</table>

(**: p<0.01)
family, friends, etc.\textsuperscript{(20,31)} is positioned as social support in coping with stress.

The results of the study confirm the previous findings that it is necessary to put the mental health of male employees in good condition before everything else in effectively developing health education aimed at improving their health habits.

This study also indicates that the level of perception of social support is related to the mental health of subjects. It is therefore presumed that measures to raise the level of perception of social support are important since they may raise the mental health of subjects.

It was shown that the level of perception of social support was definitely related to internal control involving self and family in health care consciousness. This suggests that providing health education to male employees together with their families and offering the information and location to develop positive health-promoting activities together with their families may raise the level of perception of social support. It is therefore considered that in future development of health education in companies, the level of consciousness in which health promotion is done together with the subjects’ families should be raised.

The conclusion reached here was only from the cross-sectional study and the effect of the level of perception of social support on improvement of preventive health behavior could not be clarified. Nevertheless, we expect that a further follow-up study will be able to clarify the intermediate-term effect of the perception of social support, which enhances mental health and family care consciousness in health promotion, on preventive health behavior, such as the formation and improvement of health habits.

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