HEALTH EDUCATION RESEARCH
Theory & Practice

Vol.15 no.3 2000
Pages 327–338

Health circles for teleworkers: selective results on stress, strain and coping styles

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Abstract

Telework is decentralized computer-mediated performance of work activities at a location distant from the employing organization. In order to improve well-being at such remote workplaces, we developed a health circle (HC) concept for teleworkers. Three HC sessions were conducted with a total of 17 teleworkers from diverse organizations and branches. The sessions were moderated by a professional facilitator, while the participants selected the discussion issues. Typical issues were technical problems at the home-based computer, time management, communication with supervisors, colleagues and customers, and feelings of isolation from the main company. Besides discussing these stress factors, participants developed concrete coping strategies based on the exchange of experiences and additional informational input by external experts. Process evaluation at the end of each meeting revealed that participants found the exchange of personal experiences and the informational input during the HCs very helpful, as well as the common development of coping strategies. Moreover, a questionnaire 2 months after the last HC session revealed that participants reported significantly more positive changes in typical stress factors than teleworkers in a control group. The implications of these results for preventive and corrective strategies of telework design are discussed.

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Introduction

The current approaches in Industrial Science, Industrial and Organizational Psychology, and Health Psychology generally suggest preventive and prospective strategies, directed at early detection and elimination of stressors through technical, personnel and organizational interventions. However, not all risks and potential stressors can be foreseen, particularly not in new and innovative work settings. Therefore, besides preventive and prospective strategies, there is a need for corrective procedures that enable teleworkers to cope with unexpected difficulties in a more flexible way. Prominent examples of such a corrective strategy are group-based interventions that we describe as 'employee circles'.

Originally developed in Japan as part of Total Quality programs, employee circles are a formalized organizational procedure for line workers incorporated into groups in order to continuously improve productivity and working conditions [*cf.* (French and Bell, 1995)]. A typical employee circle consists of five to 10 employees from the same hierarchy level who voluntarily meet regularly to identify, analyze and solve work-related problems (except salaries and interpersonal conflicts). These problems are usually chosen by the participants, providing employees with the opportunity to directly influence their working conditions. Thus, employee circles can be conceived as a strategy for personnel and organizational development that can be established parallel to existing organizational structures.

Early concepts of such employee circles mainly emphasized quality issues of production processes.

Indeed, 'quality circles' as perhaps the most prominent example of employee circles have been shown to increase productivity and the quality of products, as well as to improve employee motivation, group climate and job satisfaction (van Fleet and Griffin, 1989; Kunzmann, 1991; Battmann and Liepmann, 1993). However, more recent concepts of quality circles increasingly address a broader range of themes, including health-related issues such as workers' safety or interpersonal problems on different hierarchical levels of the organization (Antoni, 1990; Buch, 1992). This trend might be indicative of a particular need of employees to discuss health-related issues with each other in order to find coping solutions as well as mutual support.

Although health-related issues can be addressed in quality circles, this might lead to unsatisfactory results because the discussion of these problems often requires a different group climate (e.g. higher mutual trust) than the discussion of issues related to optimizing productivity. As a consequence, we suggest that health-related issues in organizations should be addressed in specific 'health circles' (HCs). These are employee circles that particularly focus on workplace-related strains in order to develop appropriate coping strategies. Contrary to quality circles, participants of HCs focus on problems and requirements that are relevant for their own well-being rather than for optimizing production processes [see also (Brandenburg and Slesina, 1994)]. The label 'health circle' emphasizes this focus and was chosen to encourage the participants to discuss their *subjective* stress experiences. The general concept of HCs has already been successfully applied to different kinds of companies (Brandenburg and Slesina, 1994; Westermayer and Bähr, 1994; Weigl and Bremer, 1996; Ducki *et al*., 1998). We will explain the concept further below in more detail.

Tele-cooperation and new ways of working

Telework is a decentralized computer-mediated work form that enables employees to work in locations distant from the main organization. As a relatively new work form, telework is perceived as having increasing potential especially in areas with low levels of infrastructure (Godehardt, 1994; Korte and Wynne, 1996). Considering the implications of telework for health, well-being and quality of life, researchers have stressed a number of technical as well as personnel and organizational pros and cons. On the positive side, telework can facilitate the coordination of work and family-related tasks, foster autonomy in the scheduling of working hours, and provide additional free time due to the lack of commuting. On the negative side, however, telework might produce additional strain for employees because it might consolidate discrimination against certain disadvantaged groups of employees (e.g. women, disabled persons), because work and free time are harder to separate during telework, because telework might restrict career opportunities or because social isolation might foster tendencies of over-ambition and self-exploitation. A number of reviews on the consequences of telework have been presented in the past years, discussing issues of communication (Andriessen 1991), organization (Chapman *et al.*, 1995; Konradt *et al.*, 2000), and quality of life and work (van Sell and Jacobs, 1993; Mundorf *et al*., 1994; Büssing, 1998; Konradt *et al.*, 2000). However, these reviews usually did not explore factors that might be relevant for corrective interventions in order to promote employees' health and well-being.

To fill this gap and to provide a concrete corrective intervention procedure for health-related problems of telework, we applied the concept of employee circles to telework conditions. However, the special characteristics of telework made some basic changes in traditional HC concepts necessary:

- The number of teleworkers in many organizations is rather small and may not be sufficient for an employee circle. As a consequence, the necessary number for HCs can sometimes only be reached when these HCs are not organized within parts of an organization but across certain

departments or even across organizations (trans-organizational HCs).

- Trans-organizational HCs require additional journey time. In order to maintain a reasonable cost–benefit relation, the usual duration of HC meetings (1–2 h) should be increased and more than one issue should be discussed during each meeting.
- Particularly when HC meetings are longer and the composition of the groups is rather heterogeneous, meetings should be moderated by a professional facilitator from outside the organizations—preventing role conflicts and promoting the development of clear procedural rules.
- Family-related issues should be included in the list of HC topics because of (1) the spatial and procedural interrelation between occupational and family-related activities during telework, and (2) role conflicts of teleworkers who often have to be professional employees and caring parents at the same time. Such inclusion of private issues requires additional emphasis on mutual trust and a good group climate during the conduction of HCs by the facilitators.

The objectives of this study were two-fold. First, we wanted to explore typical stressors and strains of telework as well as appropriate coping strategies. Contrary to existing occupational health studies, we chose a *formative evaluation approach* giving immediate feedback on occupational stressors to employees in order to use the experiences and implicit knowledge of teleworkers as a resource for the development of appropriate coping strategies [see also (Hartman *et al.*, 1991; Norman *et al.*, 1995)]. Secondly, we examined the perceived usefulness and efficacy of our HC concept following a three-stage procedure. During an *action research* stage the HCs were conducted identifying participants' concerns and giving feedback in order to support the development of coping strategies. A *process evaluation* immediately after each HC explored participants' subjective views of the HCs. Finally, an *impact evaluation* 2 months after the last HC compared HC participants with teleworkers in a control condition regarding typical stress factors.

Conducting HC for teleworkers

Participants

The study was conducted in the context of a larger longitudinal study on the effects of telework (Konradt *et al.*, in preparation), which in turn was part of a program sponsored by the state government of Schleswig-Holstein, Germany, to promote telework. Participants were recruited by contacting the different companies which participated in this program. About 50 teleworkers were contacted by personal mail and invited to participate in the HCs. Attached to the invitation letter was a list of typical telework-related stressors, e.g. workplace conditions at home, time management and maintenance or loss of social contacts to colleagues in the company. Contacted persons were asked to indicate their interests in order to create a preliminary list of topics for the HCs and to increase their motivation to participate.

Seventeen employees (14 female and three male) participated in three HCs (eight, seven and seven teleworkers in each session, respectively) with five persons participating in more than one HC session. The HC sessions were held during a time span of 11 months outside of participants' workplaces in a hotel. Travel expenses were reimbursed by the state of Schleswig-Holstein (travel time varied between 0.5 and 2 h). Participants came from different companies and branches (e.g. data processing, financial services, public administration, paper industry, consulting, education) of different sizes. Fourteen participants had to care for one or more children during telework. These teleworkers were sometimes supported by childminders or relatives. All participating teleworkers had regular meetings in their companies.

Procedure of the HC sessions

Each of the three sessions lasted about 5 h including a break of 1 h. At the beginning, the facilitator (a trained psychologist) welcomed the participants who then introduced themselves to the group. Then, in the first phase (about 2 h) the main topics of the meeting were discussed in the group,

mediated by the facilitator. A 1 h break followed during which participants had the opportunity for informal exchange and discussions. In the second phase (about 1 h), the facilitator provided informational input on coping strategies for the stressors discussed in Phase 1. Then, in the third phase (about 1 h) the group developed concrete coping strategies for these stressors in a group discussion again mediated by the facilitator. In the final phase, participants were asked to give feedback about their personal experiences and perceived benefits from the HC session.

The topics for the HCs were chosen according to the preferences of the participants. Three main themes emerged that were addressed by the three HCs in turn: (1) the working place at home, (2) contact with supervisors, colleagues and customers, and (3) coping with computer problems. During the introduction of each HC, the facilitator visualized and structured major discussion issues and individual comments of the participants on a protocol board. However, most of the discussions as well as the development of concrete coping strategies were dominated by the input and suggestions of the participants. The facilitator predominantly ensured that all participants could share their perceptions, and that differences in individual experience and evaluation were acknowledged.

Results of the HC work: strains and coping strategies

In the following part we describe the results of the three health circles in more detail, emphasizing stress and strain factors of teleworkers as well as related coping strategies that were developed by the participants during the HCs. Although the three HCs differed in their title and main focus (see above), there was considerable overlap in the identified strain factors and the discussed coping strategies. In order to increase readability, we combined the results from the three HCs and arranged them by content aspects rather than presenting the results from each HC separately. Moreover, we report the related developed coping strategies immediately after the description of each strain factor.

Technical skills and equipment

Participants of the HCs explained that they generally had no problems with data processing or the use of PCs and computer networks. Computer-related expertise was already high for most participants before they started teleworking. Participants even reported that their interest in computer-related issues had further increased during telework.

However, the *(online) connection with the company was often mentioned as a strain factor* due to obsolete or inadequate technology. Some of these problems only existed in the initial phase of telework and were solved later, others persisted. Also, participants reported that their online connections to the company were often restricted, for different reasons. Some of the teleworkers had tasks that required only occasional access to the company's network. Other teleworkers had restricted online access in order to save expenses for the company. However, these restriction led to specific problems that undermined the efficacy of such cost-saving strategies. For example, when different teleworkers were working on the same documents, interruptions in the online connection sometimes lead to work on obsolete versions of these documents and produced extra work for up-dates.

The affected teleworkers partly solved this problem by shifting their work to evening and night hours, thereby ensuring that other colleagues were not working on the documents simultaneously. However, these involuntary night shifts led to restrictions in the time schedule and to conflicts within the family. The more promising coping strategies for technical problems were related to improving the equipment, e.g. the use of new hardware and software, appropriate budgets for technical equipment, and the installation of a separate server for the communication with teleworkers.

Time management

Although having flexible working hours is often mentioned as one of the advantages of telework, the experiences of the participants in our HCs

were rather ambivalent. Many of the teleworkers appreciated their autonomy because they could coordinate work better with their family duties. Also, many teleworkers stressed that working at home could prevent external disturbances. Particularly the lack of interruptions by supervisors and colleagues was mentioned as one of the factors that facilitated work by increasing the concentration at the work place.

On the other hand, some of the participants stressed that flexibility of working hours could also facilitate external disturbances. Such interruptions in the working schedule could be caused by children (e.g. illness, cancellation of school hours or the child minder), private phone-calls (relatives, friends) or technical problems. As a consequence, working times had to be shifted into the evening and the weekend which was experienced rather negatively.

As another time-related strain, participants described several time consuming but unproductive activities in their computer-based work that they labeled 'time eaters'. Some of these time eaters were caused by incompatibilities between the computer platform and the software versions or obsolete software versions. Although these problems can also occur under non-telework conditions, they can be more severe for teleworkers because support from computer experts is rare or difficult due to the partition from the company. Another time eater mentioned was the reconfiguration of the computer after installation of up-grades. For teleworkers in remote workplaces such maintenance of the technical equipment and adaptation of new software versions took a considerable amount of working time that was often not acknowledged by supervisors and colleagues. Finally, participants also mentioned unmotivated surfing in the Internet and computer games as time-consuming but unproductive activities that might occur more easily in remote workplaces due to the lack of supervisory or social control.

To handle time-management problems it was proposed that records of working hours and accomplished tasks should be kept in time protocols to help evaluate performance and keep working hours at an appropriate level. This was particularly helpful for telework novices. Participants also suggested developing a fixed time schedule and stressed that strict adherence to this schedule was positive for their work. Also, it was suggested that occupational and private phone calls should be separated (e.g. through different ringing sounds), and that private phone calls should be ignored during working hours. Relatives and friends could be informed about the working schedule and asked not to disturb during these hours. In order to decrease these time eaters, participants suggested adaptation procedures for the company that ensure timely software upgrades, as well as personal strategies such as self-control and time-management training. Generally, participants emphasized the need to develop personal strategies to cope with disturbances and to decrease external control of one's work.

Disconnection from the main company

All participants agreed that their integration in the company was problematic due to working at a remote location ('Sometimes they just forget about me'). For example, invitations to celebrations or other company events were sometimes received late or not at all. Also, some teleworkers had been neglected when the company had handed out smaller presents to the employees. These unpleasant experiences increased feelings of exclusion and isolation.

As another negative aspect of the separation from the main company, participants discussed restricted opportunities for further education and for participation in in-house training programs of the company. Also, teleworkers reported that technical support from the company's computer department or hot-line often took more time than solving technical problems in the company building. For reasons of data protection, some teleworkers even had to take the whole computer to the company building when new software had to be installed. Other teleworkers felt that they were 'forgotten' by the computer department because of delays in the updates of software and the lack of training opportunities compared to non-

teleworking colleagues. This in turn increased problems based on incompatible or obsolete software versions and made work unnecessarily difficult.

However, some teleworkers also perceived positive aspects of the separation from the main company. According to their experience, telework enabled them to escape from routine and monotony in the company and to explore new opportunities with external contacts. Thus, isolated working conditions could also provide new impulses for one's own work, that in turn could lead to innovations in work conditions in the company. Other positive aspects of remote workplaces mentioned were improved computer equipment at home, which could also be used for private purposes, the opportunity to provide one's children with direct insight into one's daily work and the chance to get professional support from one's spouse or partner.

To maintain a fair integration, participants agreed that periodical presence in the company building is crucial. These hours are usually used for exchange of formal and informal information. Teleworkers even stressed that they would appreciate separate time during these days to update relevant information ('Ideal would be an extra coffee-break during these days'). While for regular employees these communication parts of the working hours are usually distributed over the working week, for teleworkers they are restricted to few days on which the teleworkers are present in the company. Therefore, the teleworkers and their communication partners (i.e. colleagues, supervisors) require additional time. For this reason, teleworkers stressed that it is not efficient to fill these presence days with tasks that have low communication opportunities.

Participants agreed that a good integration of teleworkers is also the responsibility of the company. Some teleworkers complained that their mailboxes had been removed although they still spent some days in the company building. The importance of office space in the company was stressed because it increases feelings of inclusion and facilitated the integration in organizational communication processes. In addition, such office space increased their efficiency during the time spent in the company building, providing better opportunities to complete their tasks. Moreover, participants discussed the idea of different teleworkers sharing a common office space in the company and feeling themselves as part of a team. They could alternate in the use of this shared office space and have team meetings to discuss telework-related issues in one of the 'external' offices, i.e. at the home of one of the team members. However, desktop sharing can also cause negative feelings when, for example, one's workplace is occupied by another person due to planing mistakes. Apparently, teleworkers also appreciate some privacy at their workplace in the company building.

A further means suggested to maintain a fair integration was designating certain contact persons in the computer department responsible for the teleworkers, thus establishing better routines for the exchange of information. In principle, supervisors and colleagues know about the teleworkers, but it is often unclear who is responsible for passing on information to them. Participants also suggested developing means to express that teleworkers are part of the company. A simple example is a group photo of a (remote) project team on the working desk at home and/or in the office. Team-development workshops (e.g. applying the HC concept) sponsored by the company would be an additional activity to increase the integration of the teleworkers.

Communication issues

Participants' experiences regarding communication with the company were ambiguous. Some teleworkers reported that there had been no major changes after they had started teleworking, except that communication had shifted to telephone and E-mail. However, other participants stressed that their communication had changed strongly in content and function. In particular, informal communications with colleagues had decreased and were strongly missed. On the other hand, some participants reported an improvement of task-related communications with supervisors or colleagues. Some participants even reported that

the telephone communication with their supervisor had become more informal since they had begun to telework and that this was mainly due to changed behavior on the part of the supervisor. These participants felt that their supervisors were able and willing to acknowledge the special problems of teleworkers, and showed empathy and consideration for family issues and other crucial factors of telework.

However, most positive effects were described as depending on the teleworkers themselves and their information-seeking initiative. Without a rather active communication style, participants felt that they would not receive all important information. As a possible explanation, participants suggested that colleagues might feel more reluctant to call them at home than to drop by at an office place in the company building.

As another communication-related strain factor participants complained of information deficits that were not directly related to their tasks but related to events and developments in the main company. These information deficits were especially distressing when customers had requests that the teleworkers could not treat appropriately, producing feelings of incompetence and exclusion. The information teleworkers received from their company was often too restricted dealing only with task-related issues.

Participants proposed a number of strategies and suggestions to deal with the communication difficulties of telework. The main point was that teleworkers have to become active and take the initiative themselves to cope with the problems. A good example was to choose a colleague from the same company department as a contact person to be a direct or indirect 'information partner'. Regular contact with this information partner can facilitate the flow of information, particularly on informal issues and information about more general developments in the company.

Assessment of work performance

The uncertainty about the work-related attitudes and perceptions of others was described as another stress factor by the teleworkers. Participants suspected that colleagues and supervisors developed unrealistic and biased perceptions of telework. For example, colleagues might interpret it differently when a teleworker is not available at the phone at home compared to the same instance for a colleague in a company office. Teleworkers also were unsure whether supervisors have a higher need for control in their case. For example, one participant reported that she had experienced high justification pressure from her supervisor when she applied for telework.

A related origin of strain was work interruptions due to computer failures or breakdowns, especially in online operations. These technical disturbances are particularly frustrating for teleworkers because they are not as transparent for colleagues and supervisors as similar interruptions in the company building, and increased worries of teleworkers that their own performance might be underestimated. As a consequence, teleworkers experienced pressure to compensate for these interruptions by working extra hours, although the cause for the interruption was beyond their control.

In a similar vein, flexibility in working hours sometimes led to a feeling of insecurity about performance standards and expectations of supervisors, that in turn caused stress and additional working hours. Most of the participants had difficulties in reliably evaluating their own telework performance. They often mentioned time problems due to the lack of a fixed work schedule with clear break times. As a consequence, they often had the feeling that only the time when they were working effectively—in some cases only the time when they were online—could be counted as working time. Interruptions that are often not under the control of teleworkers and that regularly occur under non-teleworking conditions (e.g. software problems) were accompanied by feelings of guilt particularly in telework novices.

In order to handle feelings of guilt and stress due to unclear performance standards, teleworkers found it helpful to compare their work conditions with regular office work in which persons also spend a certain amount of time chatting informally

or working at less than full concentration. Instead of colleagues passing by and asking a casual or private question, in their situation their children sometimes interrupted concentrated work. Participants also stressed the importance of developing a realistic estimation of how much efficiency is necessary and how much autonomy is required to accomplish work in a satisfactory way comparable to non-telework conditions. Moreover, teleworkers mentioned the importance of a realistic estimation of working time required for a task, that in turn is the basis for a realistic work schedule (see also 'Time management').

However, there were also positive effects of telework on self-assessments. Teleworkers generally expressed an increase in subjective competence and self-efficacy during their work ('I feel more competence in my working field'), as well as feelings of higher independence and motivation. Compared to their former workplaces most of the participants reported enriched working conditions because they had to collect more information by themselves (e.g. to solve technical problems, to use Internet services, etc.).

Process evaluation of the HCs

Procedure

At the end of each HC, a verbal feedback block (group discussion mediated by the facilitator) gave a direct impression of participants' feelings during the HC and how useful they found the developed coping strategies. Although such feedback immediately after an intervention can be subject to short-term enthusiasm and social desirability effects [(Goldstein, 1993), p. 196], it nevertheless reflects the general climate during the intervention and provides concrete suggestions that participants might have forgotten at a later point of time.

Since this evaluation was meant to be rather explorative, we preferred a rather unstructured procedure with open questions over a more standardized measure. At the beginning of each feedback block the facilitator asked each participant in turn what they had liked and what they had disliked during the HC session, as well as which of the developed coping strategies they felt they could apply to their daily work. The results of the feedback blocks were documented by the facilitator on flip-charts.

Results

The feedback of the participants revealed that the HCs were generally experienced positive and stimulating. In summary, the comments of the participants can be categorized under the following main issues.

- *Exchange of experiences.* This was experienced as very positive. Participants found it helpful and relieving to express personal work strains, to develop a better understanding of work-related difficulties and to learn that other teleworkers (inside and outside of the company) were struggling with similar problems.
- *Stress management.* Participants found it helpful to distinguish between work problems that can be influenced by themselves and problems that are rather under the responsibility of the company. Referring to problems under their own control, participants found it helpful to learn more about their individual influences on stress factors. Especially the discussion of information deficits revealed that many problems in telework call for personal engagement and own initiatives.
- *Exercises and presentations by experts.* These parts of the HCs were perceived ambiguously. Whereas exercises to improve stress management and physical health (e.g. back exercises) were generally perceived positively by all teleworkers, some participants found the information about hardware and software issues irrelevant for their special working conditions.
- *Future.* In general, most participants were optimistic that they would be able to apply at least some of the learned coping strategies in their daily work. Most of them also expressed the wish to continue the work in HCs.

Of course, these results are only a selection of thoughts from the participants and might be subject to positive biases that we mentioned above. A

more systematic evaluation in further studies is desirable to replicate and further explore these results.

Impact evaluation of the HCs

Procedure

In order to evaluate the long-term impact of the HC intervention we sent a questionnaire to the 17 HC participants 2 months after the final HC to measure perceived changes in time management, communication issues and ergonomic conditions. To compare the results of this questionnaire with an appropriate baseline, a control group of teleworkers was included who were recruited from the same sample as the HC participants (Konradt *et al.*, in preparation). Thus, both the HC participants and the control group members were subject to scientific investigation months before the HCs were conducted, decreasing the chance that positive effects of the HCs were artifacts of the investigation process [e.g. (Rosenthal, 1966)]. Also, HC participants and control group members were similar with respect to branches and sizes of their companies. Eleven of the HC participants answered the questionnaire along with 12 teleworkers in the control group.

In order to measure specifically changes in the stress factors that were addressed by the HCs, we developed the following items: (1) ergonomic issues ('Has your behavior in front of the computer screen and with the computer [e.g. body position; head, hand, or eye movement, break structures] changed during the study?'), (2) time management issues ('Has your time management [e.g. time schedules, working procedures, coping with interruptions] changed during the study?') and (3) communication issues ('Has the communication with colleagues, supervisors, or customers changed during the study?'). Items were answered on a five-point answer scale.

Results

The results showed that teleworkers who participated in the HCs reported more positive changes in all three aspects compared to the control group (see also Table I). A 2 (participation in the HC)×3 (issues) ANOVA with the second factor treated within subjects revealed only a significant main effect for the first factor, $F(1,16) = 18.10$, $P < 0.002$ (lower degrees of freedom are due to missing values on item level). All other effects were not significant, Fs < 1. Thus, participation in the HCs led to significantly more positive ratings on all three measured stress indicators. This result suggests that the conducted HCs not only had positive effects on health promotion in the short run, but that teleworkers could transfer the developed coping strategies to daily work conditions producing considerable long-term effects.

Table I. *Mean values of the evaluation questionnaire items*

	Ergonomic issues	Time management	Communication issues
HC participants	0.89 ± 1.05	1.50 ± 1.41	1.33 ± 1.12
Control group	0.17 ± 0.39	0.33 ± 0.65	0.18 ± 0.60

Higher scores indicate stronger changes during the longitudinal study; ranging from 0 = 'no changes' to 4 = 'very strong changes'. Standard deviations are given.

Discussion

The present study explored for the first time (to our knowledge) a HC concept for teleworkers. Compared to traditional employee circles, e.g. in the field of quality control, the developed and applied HC concept was characterized by three main differences: (1) participants from different companies and across branches, (2) an extension of contents to include family-related issues, and (3) an extended duration of the circle meetings. In addition, the HCs were supplemented by presentations and practical exercises conducted by invited experts who provided informational input on health- and computer-related issues specific to teleworkplaces.

The general objectives of the HCs were to identify the main stressors for teleworkers, and to assess and develop appropriate coping strategies based on expert knowledge and the personal experiences of the participating teleworkers.

Although participants came from different companies with different occupational activities, the process evaluation suggested a broad consensus about predominant strains, as well as about appropriate coping strategies. According to the preselected topics and results, teleworkers mainly struggled with (1) time management problems due to the overlap of occupational and family-related activities at home, (2) the maintenance of formal and informal communication with supervisors, colleagues and customers, and (3) technical hardware and software problems at the home-based computer. This result is in accordance with recent reviews on the consequences of telework on the quality of life (Büssing 1998; Konradt *et al.*, 2000). However, the results also suggest potentials for preventive health promotion strategies such as improved time management, enlarged autonomy for decisions and activity planing, and interventions that increase feelings of responsibility and self-efficacy.

Moreover, the results demonstrated that HCs can be a useful instrument for teleworkers to develop and assess coping strategies in the sense of a corrective intervention procedure. The developed coping strategies were related to aspects of the workplace environment, individual working techniques and the organization of working activities. As a major issue, teleworkers stressed the need for personal engagement and activity to overcome barriers in the information flow and to maintain their integration in the company. Also, a clear separation (including fixed time-schedules) between work and family-related activities at remote workplaces seems to be crucial for successful telework. Although this notion might be subject to intercultural differences (Garhammer, 1997), our results underline that telework requires major adaptations and changes within the family and private sphere that can only be partly supported by the company.

On the other hand, our results also reveal a number of possible improvements in telework conditions that can be influenced by the organization. Most of them refer to improved work design, e.g. increased scope of action in the working tasks (job enrichment), appropriate technical equipment according to ergonomic standards and clear procedural regulations [cf. (Konradt *et al.*, 2000)]. Moreover, designating communication partners and providing optional workspace for teleworkers in the company building might be additional means for an organization to foster the well-being of their remote workers.

The process and impact evaluations have demonstrated that participants perceived the HCs as a successful tool for coping with telework-specific stressors. The feedback given by the participants at the end of each HC session suggested that even the mere opportunity to share and exchange personal experiences of typical stress factors was already helpful and positive for the participants. There is considerable work on stress at the workplace demonstrating that social support by co-workers and supervisors can be an important compensation factors [e.g. (Zapf *et al.*, 1996; Frese, 1999)]. Due to the stronger isolation at remote workplaces, teleworkers might be especially prone to health risks due to a lack of such social support. The introduced HC concept might be one intervention that can compensate this health risk. Moreover, the informational input by experts as well as participants' own development of coping strategies are additional means to improve stress resistance that were evaluated quite positively by the participants.

Moreover, HC participants reported significantly more changes in major stress factors than a control group of teleworkers in a questionnaire that was conducted 2 months after the last HC. Apparently, the HCs were not only perceived as a positive and useful procedure immediately after the sessions, but had longer lasting effects and could be transferred to the daily work situation. Of course, our data have to be treated with caution because we only measured subjective ratings and no objective (health) data. Furthermore, we did not control for differences in motivation and/or differences in the workplace conditions between the two groups. Replication studies with a stronger control for these factors are desirable. However, our data can at least be interpreted as first evidence for the

significant stress reducing effects of HCs for teleworkers.

In addition to the limitations in the impact and process evaluations mentioned, the relatively small sample size in our study recommends also a rather cautious generalization of the results. However, this is at least partly symptomatic for research on telework in general. In spite of the initial enthusiasm for remote work forms there are still not many companies that have established telework as a core technology. Over the last two decades there are only about 20 studies with a reasonable sample size (Konradt *et al.*, 2000). Due to measurement and design problems in most of these investigations we have no clear and empirically based specification of stressors, strains and appropriate interventions at teleworkplaces. In other words, the research on health promotion at teleworkplaces is just beginning and the present study is considered as a first step in this direction.

The results we have so far suggest that the introduction of teleworkplaces requires supporting activities on the personal and organizational level in order to minimize and/or prevent stress and maladjustment. One advantage of the developed HC concept is that it is not restricted to larger organizations but provides opportunities for small and medium-sized companies. Particularly, conducting trans-organizational HCs, in which teleworkers from different companies participate, can help to keep expenses low. Moreover, with the further development of Intra- and Internet technology it might be possible to conduct virtual HCs, further decreasing costs because participants would not have to be physically present at the HC sessions. Current discussions on the use of telecommunications for health care across distances emphasize the opportunities and challenges of this emerging field (Nickelson, 1998). However, to our knowledge, there are no empirical explorations of virtual forms of employee circles available at the moment.

HCs not only promote the well-being and stress resistance of employees at remote workplaces, they may also affect the culture of the main organization. During the HC sessions participants also develop and establish common values, norms, goals and work forms. In this way, employees can participate in major questions of work design [*cf.* (Hertel *et al.*, 1998). Thus, HCs can also be used to develop a corporate identity that might be particularly important for 'virtual organizations' in which predominantly remote forms of cooperation entail risks of low commitment and identification with the company (Nilles, 1994; Kugelmass, 1995). A further and more detailed integration of HCs in broader concepts of organizational development will be one of the next tasks for organizational psychologist as well as for consultants and change managers.

Acknowledgements

We wish to thank Astrid Niemöller, Sven Thomsen and the Barmer Ersatzkasse for their support in conducting this study. Moreover, financial support by the Technologie-Stiftung Schleswig-Holstein is gratefully acknowledged

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Received on August 1, 1999; accepted on October 29, 1999