

Low-Cost Improvements for Reducing Multifaceted Work-Related Risks and Preventing Stress at Work

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Abstract

Types of low-cost improvements that can help reduce work-related risks and prevent stress at work are reviewed by examining simple improvements achieved by participatory action-oriented programs in different work settings. Programs reviewed include WISE (work improvement in small enterprises) projects in various industries, including POSITIVE (participation-oriented safety improvements by trade union initiative) activities by trade unions, and recent mental health interventions for work stress prevention. Participatory steps undertaken commonly comprise learning local good practices, group work on feasible improvement options and consensus building on immediate actions. These common steps are found effective for achieving multifaceted improvements at low cost in short periods. Typical low-cost improvements by work improvement programs cover materials handling, workstations, physical environment and work organization, whereas those by stress prevention programs additionally cover internal communication, restful schedules and social support measures. The planning and implementation of these improvements are usually facilitated by the use of action-oriented toolkits including good examples, action checklists listing practical low-cost improvements and group work sheets. Serial intervention studies confirm reductions in workplace risks, often with productivity increase, in both work improvement and stress prevention activities. Main contributing factors leading to these positive achievements are (a) simple procedures aimed at good practices in multifaceted risk management, (b) a clear focus on locally feasible improvements that have real impact on risk reduction, and (c) the use of locally adjusted action-oriented toolkits. These results demonstrate the importance of promoting participatory programs relying on multifaceted low-cost improvements in reducing the work-related risks and stress in varied work situations.

Keywords: Participatory programs; Low-cost improvements; Work-related risks; Stress prevention; Action-oriented tools

Introduction

An increasing emphasis is placed internationally on participatory action-oriented methods in improving ergonomic aspects of work and preventing stress at work. The merits of these participatory methods are widely recognized as means of promoting the initiative of workers and managers applying workable solutions in diversifying work settings [1-4]. This progress is in line with the wide application of locally effective strategies based on macro ergonomics principles for improving the quality of work life with a focus on the interaction of technical, cultural and psychosocial factors with overall system performance [5,6]. One of the notable merits of participatory methods is their direct contribution to realizing locally adjusted forms of good practices despite various constraints [5-7].

These participatory methods are extensively used in workplace improvement in association with proactive risk management processes being promoted as part of occupational safety and health management systems in both industrially developed and developing countries [8,9]. Recent studies on the promotion of participatory programs in

occupational safety, health and ergonomics clearly indicate that voluntary workplace improvements in multiple technical areas can lead to the actual reduction of work-related risks in various work situations [3,4,10-13]. It is important to know how the application of participatory methods can help workers and managers undertake the risk-reducing work re-design in these different situations including small-scale workplaces [14-19]. It is also important to know types of support appropriate for improving working conditions particularly in small-scale workplaces despite their many constraints [6,20,21]. Further, it is useful to clarify how participatory approaches can facilitate consensus building of local people for prompt improvement actions [4,22].

The advantages of participatory methods have been demonstrated in the application of participatory ergonomics and action-oriented training involving many small workplaces [23]. Wilson and Haines defined participatory ergonomics as the involvement of people in planning and controlling a significant amount of their own work activities, with sufficient knowledge and power to influence both processes and outcomes in order to achieve desirable goals [24]. This definition is relevant to the spread use of participatory methods in workplace improvement and in stress prevention, as proven by many reports on participatory steps conducive to spreading locally workable

good practices [3,7,23,25-28]. These reports suggest that multiple low-cost improvements applied through such good practices can actually reduce physical and mental workloads, improve work efficiency and interactive communication and advance social support for workers.

In examining the contributing factors to the wide-ranging risk reduction through participatory programs, attention is drawn to practical procedures corresponding to risk management steps, the selection of feasible low-cost improvements, and the types of action-oriented toolkits used [4] This paper discusses the practical ways effective for facilitating low-cost improvements through participatory steps in workplace improvement and stress prevention programs reflecting these factors. The analysis of the steps commonly taken particularly in planning feasible improvements on the voluntary basis and the features of effective action tools suggest the need to promote similarly effective steps adjusted to local conditions and leading to concrete results.

Materials

Recent experiences in applying participatory methods to multifaceted workplace improvements in different work settings are reviewed. The action-oriented procedures in achieving locally feasible low-cost improvements having real impact on reducing work-related risks are examined to know the types of support useful for spreading good practices in diversified work situations [3,4,6,8].

Participatory programs reviewed

The experiences reviewed cover participatory programs for small-scale workplaces including small and medium-sized enterprises and home-based workplaces and those for stress prevention in varied workplaces. These programs commonly apply action-oriented steps taken for planning and implementation of multiple low-cost improvements feasible in each local situation. The reviewed programs include the following:

- Participatory action-oriented programs promoted by the International Labour Office (ILO), applying WISE (work

improvement in small enterprises) methods, organized through occupational safety and health projects by trainers trained in the methods [6,16,29-32].

- Participatory programs undertaken by trade unions using POSITIVE (participation-oriented safety improvement by trade union initiative) methods, organized by national trade union centres in Asian countries [33,34].
- Participatory programs for preventing stress at work in some industries, health care facilities and local government offices, organized by occupational health teams [18,35-38].

Examination of participatory procedures

The simple procedures used, types of low-cost improvements achieved and roles of action-oriented tools are compared between these participatory programs in different work situations, to know the relation between the participatory steps and the effectiveness of low-cost improvements achieved in relation to work-related risks. The results of follow-up case studies on the effects of participatory interventions on reducing work-related risks and preventing work stress are referred to. On the basis of the review results, main contributing factors for achieving actual risk and stress reduction at the targeted workplaces are discussed.

Results and Discussion

Participatory steps taken for building on local good practices

The participatory programs reviewed are developing based on the extensive experiences gained in the application of the original WISE methodology [8,29]. The WISE programs are applied in many countries, practically in all the continents in the course of the 1990s and the 2000s giving strong influences to other participatory programs [12,31]. The subsequent development of participatory methods for workplace improvement clearly reflects the trends favouring the newly emerging participatory action-oriented training approaches [3]. Some of the prominent trends in this direction are listed in Table 1.

Common features	WISE, POSITIVE and similar work improvement programs	Participatory stress prevention programs
Preparatory activities	Preparing action-oriented training materials including local good practices and action tools	Preparing action-oriented guide manuals including local good practices and action tools
Participatory steps	1-3 day workshop with serial group-work sessions for identifying existing good practices and proposing actions	Brief workplace-level workshop on existing good practices and feasible improvements
Planning of actions	Improvement action plans locally feasible in multiple technical areas	Workplace-level plans of multifaceted improvements feasible by the deadline
Implementation and follow-up	Immediate implementation and reporting through facilitators	Implementation and reporting of actions taken and feedback

Table 1: Trends in participatory procedures taken by work improvement programs and recent stress prevention programs.

As shown in the Table 1, participatory approaches are undertaken so as to respond to local needs at each particular workplace. In this context, a clear emphasis is commonly placed on locally achieved good practices in improving working conditions as well as safety and health of workers. This is because participatory approaches are often initiated to improve the workplace design or work environment in dealing with problems related to work stress or low productivity [4,5]. They are undertaken similarly, often for reducing onsite risks, as in the case of

workplaces suffering from work-related accidents and illnesses such as musculoskeletal disorders [11]. A more recent trend is to resort to participatory approaches in improving work organization and working schedules [4,38].

Composition of the participatory procedures commonly applied

Prominent trend learning from these approaches is to use participatory methods for improving the workplace conditions for safety and health management systems [8]. The reviewed programs undertaken in our Asian inter-country network rely on participatory steps aimed at immediate workplace improvements in line with local good practices. This is shown by the principles adopted by the WISE methods. The uniqueness of these principles is to build on local practice, while focusing on achievements and linking working conditions with other management goals, and use learning-by-doing methods together with the exchange of experiences and active worker participation [12,31]. The same principles are applied also in other programs reviewed [6,22,34].

Reflecting these principles, the steps taken by WISE, POSITIVE and other programs are to undertake serial group work by forming change groups of local people. Similar serial steps are also taken in the case of participatory stress prevention programs reviewed. The tasks of the change groups are to learn from local good practices and plan and implement practicable changes so as to build on the local practices. The fundamental steps are shown in Figure 1.

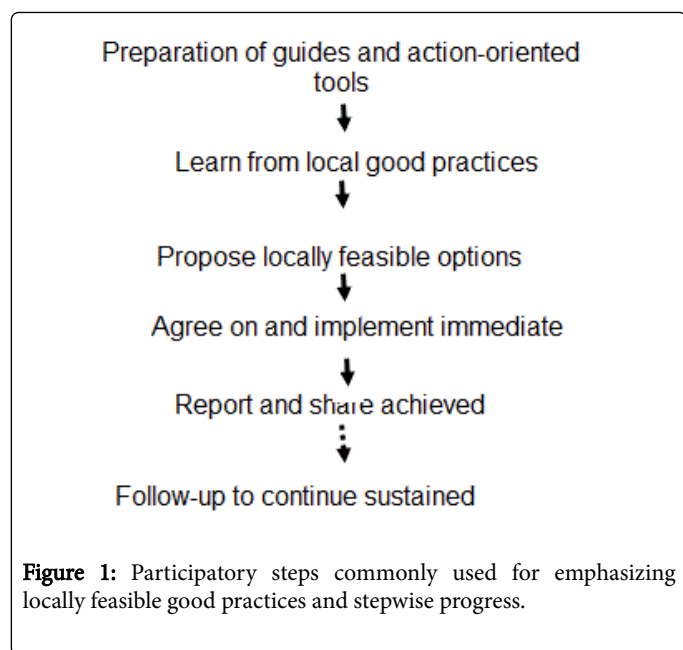


Figure 1: Participatory steps commonly used for emphasizing locally feasible good practices and stepwise progress.

The common change strategy

Corresponding to the common steps, the WISE and similarly action-oriented programs usually consist of serial steps comprising checklist application, group discussion of local good examples and locally practicable changes. POSITIVE training also consists of group-work sessions on low-cost improvements and action plans of immediately feasible changes. It is striking that the participatory stress prevention programs also apply a participatory workshop on local good examples and locally feasible improvements although the range of improvement actions seems broader compared with WISE and POSITIVE programs. It should be noted that these participatory methods are used in a stepwise manner with the aim of proposing broad-ranging improvements. The simple nature of the participatory

steps seems essential for consensus building of practicable improvements in the local context.

The common change strategy utilizing simple procedures for building on local good practices therefore plays a key role in effectively conducting the participatory steps. The participants can in this way look at feasible options available for them and subsequently plan similarly workable improvements learnt from these existing practices.

Types of locally feasible low-cost improvements in multiple areas

The consistent focus on locally feasible low-cost improvements is obviously useful in organizing the participatory steps in a locally adjusted manner. In all the reviewed programs, this focus on low-cost improvements that are locally achievable makes it easy for the participating workers and managers to plan immediate actions in multiple technical areas [12,29]. The participants can relatively easily understand the types of improvements aimed at, visualize how to conduct such improvements, and therefore mutually share low-cost options that can be proposed and implemented promptly.

This is demonstrated in the similarity of the range of improvements achieved by the WISE, POSITIVE and related programs with an emphasis on ergonomic improvements [3,6,23,32]. Usually a fairly large number of low-cost improvements can be planned in broad technical areas [6,32]. The range of low-cost improvements done by typical WISE, POSITIVE and stress prevention programs are shown in Table 2. The low-cost improvements achieved by WISE and POSITIVE programs cover main areas of ergonomic improvements compiled in the ILO manual Ergonomic Checkpoints [32]. In the case of stress prevention programs, the achieved improvements cover the main six areas considered important for improving mental health of workers by applying the Mental Health Action Checklist [4,35,37].

(A) Work improvement programs in small and medium-sized workplaces				
Technical area	Examples of improvements	WISE (the Philippines)	POSITIVE (India)	
Materials handling	- easy-to-handle storage, transport	20	14	
Workstation design	- better workspace, efficient operations	8	17	
Work environment	- improved microclimate, protection from environmental hazards	39	26	
Welfare facilities	- improved essential facilities	24	28	
Work organization	- better teamwork arrangements	9	6	
Others	- training, emergency planning		9	
Total number of reported improvements		1725	78	

(B) Stress prevention programs			
Technical area	Examples of improvements	Health care workers (Japan)	Local government employees (Japan)

Planning of work	- joint planning of work, sharing work	5	19
Working schedules	- improved work schedules and breaks	18	4
Work methods	- ergonomic and efficient methods	31	40
Work environment	- protection from environmental risks	22	25
Social support	- promoting mutual support, teamwork	9	5
Access to care	- counseling, emergency planning	15	7
Total number of reported improvements in the cited activities		85	228

Table 2: Examples of low-cost improvements achieved by the two types of participatory programs and their percent distribution by technical area in typical program activities. (A) Work improvement programs in small and medium-sized workplaces, (B) Stress prevention programs.

(A) Work improvement programs		
Materials handling	Organized storage, mobile devices, efficient lifting	Fewer and faster handling actions
Workstation design	Easy reach, elbow-height work, using fixtures, easy-to-identify coding	Easier, safer and more efficient work operations
Physical environment	Lighting/ventilation, comfortable microclimate, guards/safety devices, relocating hazard sources	Barrier-free and comfortable work space through isolating hazards
Welfare facilities	Clean drinking water, hygienic facilities, resting corners	Providing essential facilities with refreshing effects
Work organization	Brief meetings, work-rest schedules, sharing information, job rotation	Improved teamwork with good communication
Other aspects	Supportive climate, access to care, training sessions, emergency plans	Interactive daily work and good work-life balance
(B) Stress prevention programs		
Planning of work	Brief meetings, joint planning of tasks, sharing essential information	Planned teamwork with shared communication
Working schedules	Limiting overtime, securing resting periods, joint planning of leaves	Restful work schedules avoiding overwork
Work methods	Improved storage and workstations, reducing repetitive work and mistakes	Easier and efficient work operations, better teamwork
Work environment	Lighting/ventilation, isolating hazard sources, restful welfare facilities	Comfortable environment and refreshing facilities
Social support	Mutual consultations, informal gatherings, newsletters/circulars	Mutually supportive climate and friendly relations
Access to care	Access to counseling, managing harassment, training, emergency plans	Emergency preparedness with easy access to care

Table 3: Typical low-cost improvements frequently implemented through the participatory programs and the most prevalent basic principles leading to these changes. (A) Work improvement programs. (B) Stress prevention programs.

Facilitating group work by utilizing locally adjusted action toolkits

The effective application of the participatory methods thus depends on their composite structure matching the participatory steps building on local good practices. We can confirm that the action toolkits for facilitating the stepwise use of the methods are best utilized when the incorporated good examples, action checklists and guides refer to low-

Linking low-cost improvements with actual risk reduction

By means of covering multiple technical areas shown in the table, participants of these programs are guided to look at locally workable options and undertake priority improvements through a group planning process. Accordingly, it is generally recognized important to point out locally feasible types of workplace changes in multiple areas that have real impact on risk reduction. The advantage of focusing on these low-cost improvements is obviously ensured by concentrating on those improvements that reflect basic principles of occupational ergonomics and stress prevention. Table 3 lists these basic principles incorporated in the typical types of low-cost improvements in the work improvement programs and those in the stress prevention programs reviewed. The emphasis placed on these basic principles is apparently conducive to helping reduce existing work-related risks. In the case of stress prevention programs, all these basic principles are also referred to, whereas additionally the basic principles concerning internal communication among co-workers and mutually supportive teamwork are frequently reflected in low-cost improvements selected by group work.

cost improvements in multiple areas in a locally adjusted manner. It should be noted that in responding to immediate needs of local people, direct attention to low-cost actions in multiple areas help build consensus for prompt improvement actions.

The toolkits commonly used in the reviewed programs usually consist of the following three “action tools”:

- Presentations of local good examples.
- Action checklists listing typical low-cost actions.
- Group work guidance materials.

It is striking that a set of these tools is utilized in all the participatory programs reviewed. The usage of these tools as a composite toolkit is found to facilitate the planning and implementation of appropriate low-cost improvements in varied work situations. In sustaining local actions using participatory methods, various efforts are made in the programs reviewed. It is commonly necessary to “tailor” the participatory methods according to particular local needs identified in each local situation. While the general structure of these methods is in conformity with the participatory steps described above, the stepwise procedures and the easy-to-utilize toolkits are adjusted reflecting the identified local needs [21,32].

Main functions of the action-oriented toolkits

As indicated in Table 4, the main functions of these components of the action-oriented toolkits are to “tailor” the participatory process of the program according to particular local needs in each local situation. The experiences in the reviewed programs indicate that this is done by incorporating local good practices and by modifying the action checklist and related guidance materials so as to list feasible low-cost options based on these good practices.

Main functions	Procedures to use tools	Reference for the usage of tools
Learn local practices for multifaceted improvements (know practicable options)	Present good examples (photos or videos)	[8,10,21,29]
Present available options (select feasible solutions)	List practical low-cost ideas (action checklists)	[4,6,23,29,31,32]
Facilitate group work aimed at prompt actions (use local skills)	Aim at immediate action (improvement guides)	[3,12,23,28,32,39]
Facilitate planning and reporting of actions (encourage consensus building)	Support joint follow-up (group work sheets)	[4,6,10,21,40]

Table 4: Main functions of action-oriented tools utilized in the participatory programs.

Photographs showing local good examples of improving existing workplace conditions, and sometimes corresponding video-clips, are extensively used to help participants learn local good practices in multiple technical areas. Action checklists re-designed according to locally prevalent good practices play a vital role in adjusting the group work process to each local situation. As these checklists list low-cost options, their users are guided to look at easily practicable improvements. Further, it is also useful to offer group work sheets that can be used to facilitate the steps for summarizing group work results and planning and reporting selected improvements.

Main contributing factors leading to effective risk reduction

Based on the outcomes of the participatory programs reviewed, we may point out the main contributing factors commonly leading to these positive achievements [4,38-40]. Based on the review results, the

main contributing factors may be deducted. We should note that these factors can contribute to the realistic planning and implementation of low-cost improvements in a combined manner. The common contributing factors may include:

- Simple procedures aimed at good practices in multifaceted risk management.
- A clear focus on locally feasible improvements having real impact on risk reduction.
- The use of locally adjusted action-oriented toolkits.

These contributing factors also play significant roles in overcoming main constraints in applying good practices in diverse work situations due to the lack of technical expertise and available resources. Participatory approaches build on local good practices are advantageous as they focus on simplified procedures and readily feasible solutions. The design and use of action-oriented toolkits are particularly useful in this direction. The local context of the consensus building procedures has proven essential.

The prospect for networking participatory approaches in various sectors

The inter-country networking of partner institutions conducting various participatory action-oriented training activities using the reviewed methods has contributed significantly to the development and dissemination of the toolkits based on the relevant participatory approaches. Local networks of core and local trainers are also found effective for organizing training activities in a structured way. Usually, core trainers are trained through the efforts of the program organizers that develop training packages and then train local trainers. These networks have a twofold effect; on the one hand, these networks secure the training of core and local trainers, and on the other hand, the structured nets of trainers can facilitate the effective development and use of participatory training methods and relevant toolkits. As the structure of the toolkits used are similar, the local adjustment of the toolkits can be done relatively easily, by presenting local good examples, redesigning action checklists so as to list locally feasible options and preparing guidance materials and locally modified work sheets.

Awareness is growing that risk management at the workplace should building on existing good practices. This means that risks should be managed in the form of the Plan-Do-Check-Act cycle to plan and implement the assessment, control and review of existing risks at the initiative of local people. Further development of participatory methods may also promote the progress in workplace risk management. It is important that WISE and similar participatory steps can constitute an effective risk assessment and control process in reducing multifaceted work-related risks including stress at work.

The exchange of positive experiences in applying the participatory methods combining the positive features discussed seems particularly useful in bridging gaps seen in small-scale workplaces including those in industrially developing countries. In view of the resource constraints in responding to local needs of diversifying work settings, it is necessary to strengthen support measures for participatory methods that can focus on practicable improvements. Effective measures in this direction may include the development and use of web-based databases of low-cost improvements and the spread usage of participatory action-oriented toolkits. The promotion of networking arrangements for supporting participatory action-oriented training approaches is thus essential.

Conclusion

The reviewed participatory methods used in both workplace improvement programs and stress prevention programs confirm the importance of building on local good practices in responding to increasingly diversifying ergonomics-related and psychosocial needs. In making the participatory steps adjusted to each local situation, it is important to organize change groups that can learn from positive achievements and focus on locally practicable improvements including many low-cost improvements. The effective use of participatory toolkits is essential, including the presentation of local good examples, the use of locally adjusted action checklists and the guidance on immediate improvements in multiple technical areas at the voluntary initiative of local people

There is a strong need to adapt these participatory methods to different work settings in different countries as seen in various attempts and support measures reported. In particular, direct support should be strengthened for developing training modules that can build on local good practices in a flexible manner. The support provided can link the workplace improvement methods with risk management procedures. The local networks of trainers and key persons are found useful in developing these modules and associated toolkits and in organizing action training in various work settings including small-scale workplaces. Inter-country networking of positive experiences can accelerate ergonomic improvements and stress prevention at work in this direction.

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