

表1 職場ストレスリスクアセスメントツール（試行版）②

要因		リスクの見積もり		リスク	改善優先度
		頻度	重要度 (影響の大きさ)		
安全・健康・環境 の改善	職場や仕事に変化がある場合、事前に説明がある (変化への対応)	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに
		<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで
		<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで
	仕事の方針と役割について、納得できるような説明 がある (公正な人事評価)	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに
		<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで
		<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで
	いろいろな立場の人が、職場の一員として尊重され ている (多様な労働者への対応)	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに
		<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで
		<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで
	意欲向上や、キャリアに役立つ教育が行われている (キャリア形成)	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに
		<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで
		<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで
仕事で自分の長所をのびる機会がある (成長の機会)	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに	
	<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで	
	<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで	
失敗しても挽回するチャンスがある職場だ (失敗を認める職場)	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに	
	<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで	
	<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで	
追加	ほかに、「こうであれば好ましい」ということはあり ますか？ 好ましい状況→ _____	<input type="checkbox"/> おれに	<input type="checkbox"/> 大	<input type="checkbox"/> 高	<input type="checkbox"/> 直ちに
		<input type="checkbox"/> 時々	<input type="checkbox"/> 中	<input type="checkbox"/> 中	<input type="checkbox"/> できるところまで
		<input type="checkbox"/> 頻回	<input type="checkbox"/> 小	<input type="checkbox"/> 低	<input type="checkbox"/> あとで

リスクの見積もり方法には、マトリクス法や数値（加算・乗算）法などがあるが、職場ストレスに関しては客観的な測定値が存在しないことから、各要因についてわかりやすいストレス状態の例を挙げ、評価者が、頻度（まれに・時々・頻回）、重要度（影響の大きさ：大・中・小）、改善優先度（直ちに・できるところで・後で）の視点で、リスク（高・中・低）を見積もり、改善のためのアクションを検討する構造のチェックリストを原案として作成した。

② 専門家による意見に基づく改定のための情報収集

ツールが何を目的としているのか理解を得るための、表現の工夫が求められた。新職業性ストレス簡易調査票は職場の長所（資源）を伸ばすことを主旨として開発されたため、これらの状態（標準）ができていないことをリスクとして評価する形態とした。

「配偶者・家族・友人からのサポート」など、私的な側面を含む項目や職場の環境に直接関わらない、個別性の高い項目は削除することとした。代わりに、リストとして挙げられた項目以外で、その職場で気が付いたリスクをアセスメントできるようにする、自由な評価を導くフォーマットとした。

③ 項目分析とその結果に基づいた項目の加除

新職業性ストレス簡易調査票における抑うつ得点（合計点）を算出し、ストレス要因の各尺度得点と、尺度を構成する項目との相関を求めた。

次いで専門家の意見と相関分析の結果を基に、抑うつ得点との相関が低い相関（0.2 未満）、私的な要素の強い項目で、職場でのリスク把握と改善になじみにくいものを削除した。

抑うつ得点と相関の低い項目は、「仕事の質的負担」「身体的負担度」「職場環境」「技能の活用度」などの項目であった。「仕事の適性」「配偶者・家族・友人からのサポート」「仕事満足度」は、抑うつ得点との相関がある程度あっても、私的な要素の強い項目と考えられた。一方で、「ハラスメント」は、重要なストレス要因としても考えられるため、ワーディングを変更して残すこととした。

④ 実施できるアクションと結びつく視点からの項目の絞り込み

問題解決志向型のツールとするため、職場で実施可能な改善アクションが共通な項目を統合し、項目群の分類を行った。さらに、改善アクションの求めにくい項目を削除した。「職場環境」は、項目分析の結果からは削除対象であったが、中小規模事業場では、具体的な改善点が多く存在するストレス要因ということで、ツールに残すこととした。

以上のプロセスにより作成した職場ストレスリスクアセスメントツール（試行版）を表1に示す。

IV. 考 察

職場のメンタルヘルス対策は、職場ストレスのリスク

アセスメントを柱としてPDCAサイクルをまわす組織的なリスクマネジメントで予防的な対策を講じることが国際水準になりつつある。職場ストレスのリスクアセスメントと対策のために簡便に利用できるツールが求められていることから、職場巡視や視察において利用可能な職場のストレスアセスメントツールの開発に着手した。化学物質管理や腰痛対策等の、既存で使用されているツールを参考にして、新職業性ストレス簡易調査票の項目をチェック項目にした職場のストレス対策のリスクアセスメントツールの雛形を作成し、専門職や労使関係者からなる会議でツールの改良点に関する助言を得た。さらに、新職業性ストレス簡易調査票とともにアウトカム指標（抑うつ症状など）を測定している調査結果を用いて、実際の新職業性ストレス簡易調査票の回答データに基づいた項目分析を行い、改善案が現実的であるものを中心に、項目の加除、ワーディング修正を行って、リスクアセスメントツールの雛形を作成した。

新職業性ストレス簡易調査票は、ポジティブな側面を取り入れた点の特徴であるが、リスクの評価を行うにあたって、ポジティブな項目（ワーディング）を、どのように利用するかは検討課題であった。ポジティブな表現を用いて、自分たちの会社をどのようにしたいと思うか具体的に示してもらい、それに対してアセスメントするようになっているカナダ等の事例や、英国の Management Standard にならい⁶⁾、職場の資源として望ましい標準的状态（達成すべき状態）を示し、その状態に到達していないことについてのリスクを評価する形態とした。

本ツールの用途—職場のストレスをどのようにリスクアセスメントするか

職場ストレスリスクアセスメントツール（試行版）は、職場巡視等の機会に、職場の労働者や管理監督者、産業保健スタッフ等が、介入が可能なストレス要因のリスクを同定するものとして開発した。職場ストレスに関しては、客観的・定量的な測定値が存在しないことから、頻度と重要度（影響の大きさ）について評価し、ストレス要因のリスクを見積もる方法を採用した。リスクの評価についても確立した評価方法はなく、頻度が「まれ」で重要度が「大」の際に高リスク、頻度が「頻回」で重要度が「小」の際に低リスク、それ以外を中リスクと暫定的に定め、現場での検証を行いたいと考えている。

改善優先度は、リスク対策のための改善の必要性和実施可能性の観点からチェック可能である。直ちに改善が必要なもの、もしくは、改善が可能なものを「直ちに」、完全でなくても改善に着手する必要があるもの、もしくは、部分的に着手可能なものを「できるところまで」、そのほかの場合「あとで」と選択する。リスクの評価に引き続いて、このような作業を行うと、改善活動のイメージを想起させ、速やかな改善のアクションの取り掛かりが期待される。たとえば、リスクが高いと評価されなが

ら手を付けられていない要因等、残存リスクの確認にも使用可能と考えられ、職場ストレス対策のPDCAサイクルを回すキーになるものと考えている。

今後の方向性

今回開発したツール自体、またこれを使用したリスクアセスメントが、現場で受け入れられるためには、ツールの用途に関して現場で挙がるのが想定される疑問について、インストラクションを記したマニュアルが必要である。リスクアセスメントに引き続く解決策を示す、アクションチェックリストも含めた方がよいことから、良好事例を盛り込むことも求められる。平成25年度厚生労働科学研究費補助金労働安全衛生総合研究事業「事業場におけるメンタルヘルス対策を促進させるリスクアセスメント手法の研究」では、改善に資するアクションチェックリストの開発も進めている。評価を簡便に知るために、初期評価から詳細評価に移る、といった2段階調査を取り入れている例⁶⁾も参考にしたツールの質的な改善項目も残っている。中小規模事業場で、さらに見やすく使いやすくするために、ワーディングの微調整とともに、フォント等の変更やイラストの取り入れを検討している。

リスクアセスメントを担当する者が一人ですべてを判断できるとは限らないため、評価者を複数にして信頼性を上げることも示唆される。オランダはアセスメントが法制化されて強制ということもあり、評価者は外部の者（外部機関）であるが、自主的な改善を目的としている場合は職場内で評価している。労働者のメンタルヘルス不調の第一次予防を目指した著者らによる先行研究での「メンタルヘルス対策の自主的な取り組みを推進する」という関係者会議におけるコンセンサスの下¹⁰⁾、自主的な取り組みを行う立場での評価ツールの開発を試みたが、評価者については、いくつかのオプションを用意したほうがよいかもしれない。さらに、リスクアセスメントを行う単位の設定（作業グループか事業場全体か）も検討課題となる。中小規模事業場で使用するには、A4用紙1枚に収まる程度の分量が好ましいと考えられたが、少数の項目では、評価の信頼性や改善アクションが限定的になるなどの限界が発生する。将来的には、小型端末（ウェブ）を利用するなどしたアセスメント方法も検討するべきかもしれない。

なお、リスクアセスメント結果を改善につなげる過程は多様と考えられる。PDCAサイクルを回すためのリスクアセスメントの場の持ち方や、改善提案から実施と評価に至る一連の取り組みを進めやすくするための仕組みなど、中小規模事業場の制約や利点を考慮した指針を示す必要がある。たとえば、評価されたリスクを誰がどのような手続きで改善計画にまとめるのか、リスクアセスメントと改善活動を、実施時期を含めて、どのように事業場活動に位置づけるのかといった点は、事業場毎に丁

寧に検討することが望まれる。

以上のような改善点について、今後モデル事業での試行で、簡便性や使い勝手、受け入れやすさ、を検討すると同時に、ツールの妥当性を評価していく予定である。

V. 結 論

既存で使用されているリスクアセスメントツールを参考にして、新職業性ストレス簡易調査票の項目をチェック項目にした職場ストレスのリスクアセスメントツールの雛形を作成した。

謝辞：本稿は、平成 25 年度厚生労働科学研究費補助金労働安全衛生総合研究事業「事業場におけるメンタルヘルス対策を促進させるリスクアセスメント手法の研究」(H25-労働一般-009) 主任：川上憲人) の研究成果である。

利益相反：利益相反基準に該当無し

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別刷請求先 〒252-0374 相模原市南区北里 1—15—1
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Development of a Tool for Assessing the Risk of Workplace Stress

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As a strategy of primary prevention against workplace mental health problem, risk management utilizing risk assessment by the personnel as the central pillar has become an international standard. In Japan, the primary prevention of mental health problems among workers has become a pressing necessity in particular for small and medium-sized enterprises, so that an expedient to assess the risk of workplace stress is required. We started to develop such a tool by referring to internationally utilized models such as the UK Management Standard as well as other existing assessment tools for prevention of health problems induced by chemical and/or physical risks. The risk items were extracted from the New Brief Job Stress Questionnaire, and then the items and the wordings were amended by taking into account the item analysis (correlational analysis with depressive symptoms) and suggestions by the stakeholders and the experts. We are planning to test the tool in relevant enterprises to evaluate the usability. Although the current version needs further refinement including attachment of action examples and the instruction manuals, the risk assessment tool would be a useful sample.

(JJOMT, 63: 7—13, 2015)

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Utility of action checklists as a consensus building tool

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Received February 10, 2014 and accepted September 1, 2014

Published online in J-STAGE September 13, 2014

Abstract: The present study's objective was to determine the mechanisms for enhancing the utility of action checklists applied in participatory approach programs for workplace improvements, to identify the benefits of building consensus and to compare their applicability in Asian countries to find the most appropriate configuration for action checklists. Data were collected from eight trainees and 43 trainers with experience in Participatory Action-Oriented Training. Statistical analysis was performed in SPSS using the package PASW, version 19.0. The difference in the mean score for the degree of the utility of action checklists between countries was analyzed using ANOVA methods. Factor analysis was performed to validate the action checklists' utility. Pearson Correlation Coefficients were then calculated to determine the direction and strength of the relationship between these factors. Using responses obtained from trainees' in-depth interviews, we identified 33 key statements that were then classified into 11 thematic clusters. Five factors were extracted, namely "ease of application", "practical solutions", "group interaction", "multifaceted perspective" and "active involvement". The action checklist was useful for facilitating a participatory process among trainees and trainers for improving working conditions. Action checklists showed similar patterns of utility in various Asian countries; particularly when adjusted to local conditions.

Key words: Participatory Action-Oriented Training (PAOT), Action checklists, Factor analysis, Participatory approach, Consensus building tool

Introduction

Participatory approaches for improving safety and health at work have been adopted in many Asian countries as an integral part of occupational safety and health management systems^{1, 2}. These participatory approaches have been widely applied within small enterprises, agricultural facilities, construction sites, and informal workplaces^{3–8}.

Typical examples include training programs applying WISE (Work Improvement in small Enterprises)⁷, WIND (Work Improvement in Neighborhood Development)⁸, and POSITIVE (Participation-Oriented Safety Improvement by Trade Union Initiatives)^{9, 10} programs, which have enjoyed widespread use in many Asian countries⁶. These programs commonly make use of the Participatory Action-Oriented Training (PAOT) methodology¹¹. Additionally, they commonly use participatory training tools such as photo sheets depicting examples of good practice, action checklists, and group work methods⁷. A number of successful participatory action-oriented workshops have

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previously been carried out in collaboration with occupational safety and health teams using these same participatory training tools¹¹).

Recent reports from these workshops indicate that the use of practical training tools such as action checklists (ACL) can be instrumental in achieving successful outcomes in PAOT programs¹²). These tools have previously been employed in training managers and workers on both farms and construction sites¹¹). In particular, ACLs guide users to propose practical improvements applicable in a range of specific local contexts^{11–13}).

These training tools are also useful in promoting simple, low-cost and practicable solutions for improving existing working conditions^{4, 5, 9, 15}). Moreover, previous studies have shown that practical and easy-to-apply training tools are more effective when they are based on local good practice^{7–9, 11, 15}). Locally designed tools can also be modified to promote the active involvement of trainees, capitalize on local wisdom and knowhow, and embed improvements to ensure their sustainability^{7, 16}). It is therefore important to understand how training tools can play a dynamic role in facilitating the design and implementation of improvement actions for stimulating meaningful and practicable change in different workplace situations^{3, 11–14}).

Various ergonomic ACLs have been developed for improving practices in a diverse variety of work contexts while placing a common emphasis on action-oriented use, application of local good practice, and low-cost improvements^{3–5, 16}). A more in-depth analysis is therefore needed to more clearly define what design principles can play a key role in assisting trainees to use action checklists to formulate locally appropriate solutions and provide guidance for improving working conditions. Studies aimed at identifying mechanisms for their utility could therefore potentially generate important insights regarding the roles of both trainers and trainees in the consensus building process.

The primary objective of the present study was to find the mechanisms for the utility of ACLs applied in participatory programs for workplace improvements. Additionally, we aimed to identify their patterns of use in building consensus by comparing the impact of their actual application in different Asian countries with the support of trainers in PAOT programs. Finally, we sought to identify the most appropriate avenues for the future development of locally adapted ACLs as a training tool for building consensus to promote and sustain improvements in a range of work settings.

Methods

Data were collected between January and March 2011 and collection methods included in-depth interviews and a written questionnaire.

Interviews

In-depth interviews were conducted with eight trainees based at three companies who had professional experience using ACLs to facilitate PAOT workshops in Japan. The eight trainees, aged 40–60, comprised managers or employees working at a cosmetics manufacturer, a care center for the disabled and a construction labor union. Twelve open-ended questions were administered to identify patterns of real-world use and to characterize their experiences using the ACL – with particular emphasis on actions taken to improve workplace conditions. These questions were as follows: “what kind of action checklist is used?”, “how many workers have used it?”, “is it used in group discussions?”, “did it help to find improvement points?”, “did it increase knowledge?”, “is it easy for making improvement actions?”, “does it strengthen cooperation?”, “is it easy to use?”, “did you find the most appropriate improvement solution?”, “will you continually use it?”, and “does it lead to higher productivity?”. An interpreter and an assistant interviewer accompanied the researcher when visiting the workplaces. Interviews were conducted in English, and, where applicable, translated into Japanese by an interpreter. They were taken in written notes. At each company, approximately 2 h were set aside for each in-depth interview. This was followed by a 1 h worksite visit to observe workplace practices at each location.

A further round of in-depth interviews was conducted on three Korean and Japanese expert trainers in the occupational health field who made use of the ACLs as part of their professional practice. These expert trainers included an International Labor Organization (ILO) specialist, a university professor and a lecturer in the field. These interviews were focused around five main open-ended questions concerning practical ways to make use of ACLs in training situations. The interview questions were as follows: 1) “do you find it easy to build consensus among trainers in using it?”; 2) “do you have a trick to make trainees to pay attention to its use?”; 3) “what is your key for finding the good points?”; 4) “does the workplace where you acted as a trainer have high productivity?”; 5) “how do you train the trainees to have a broad outlook for improvements?”. The interviews were conducted either face-to-face or by telephone in Korean and English for

the Korean and Japanese participants, respectively. These interviews lasted approximately 30 min to 1 h for each participant and interviewers took voice recordings and written notes.

Questionnaire

Fifty trainers in Korea, Japan, Vietnam, Thailand, Cambodia, and Russia with experience in PAOT in workplace setting were asked to complete questionnaires designed to obtain the views of experienced trainers on the utility of ACLs in participatory training. Forty participants subsequently responded to the questionnaire by e-mail. The questions administered were designed with reference to the responses given during the in-depth interviews with trainees. Key statements were generated using the Colaizzi phenomenological method¹⁸⁾ and the structured interviews comprised 20 questions with responses given on a 5-point Likert scale. The reliability of the data collection method used was shown to be high, with a Cronbach's alpha coefficient of 0.91. Our sample of 40 trainers included 19 participants from Japan (47.5%), 13 from Korea (32.5%) and 8 (20.0%) from other countries (6 Vietnamese, 1 Cambodian, 1 Thai and 1 Russian). The mean age of the trainers was 44.6 ± 12.1 yr and the majority had professional experience in the occupational health field.

Statistical analysis

Transcription analysis was performed using Colaizzi's phenomenological method¹⁸⁾. Extracts of key statements obtained using in-depth interviews were then arranged into groups according to their meaning. These were then classified into thematic clusters.

We analyzed the results of the questionnaire in SPSS using the package PASW, version 19.0. The difference in the mean score for the degree of utility of the ACLs between countries was analyzed using ANOVA. To confirm the validity of our tests for the utility of the ACLs, factor analysis was conducted by applying Varimax rotation. Five factors were then extracted with an Eigen value of 1.1, and these were then relabeled to indicate the particular dimensions of the ACLs' utility which they represented. We then calculated Pearson Correlation Coefficients to determine the direction and strength of the relationship between these factors.

Finally, we examined the role of ACLs in facilitating consensus building with regards to immediate workplace improvements by analyzing and reviewing the interactions between positive responses in different thematic areas. The thematic clusters used to classify the key statements

in the in-depth interviews paralleled those obtained from the questionnaire.

Ethical considerations

Participants were provided with an overview of the study in print, and provided written consent before participating in interviews. At the time questionnaires were administered, participants also received written information on privacy protection and the use of their personal information. And this questionnaire is also anonymous questionnaire studies that return of a completed questionnaire indicated continuing consent for their participation in the study. This study was conducted in accordance with the Ethical Guidelines for Epidemiological Studies, published jointly by the Ministry Education, Culture, Sport, Science and Technology and the Ministry of Health, Labour and Welfare of Japan.

Results

Aspects of the utility of ACLs based on the statements of trainees

A total of 33 key statements were extracted from in-depth interviews with trainees, as shown in Table 1. These statements were then grouped into 11 thematic clusters, which covered the following areas: "utilizing the ACL as an action-oriented tool for proposing improvement actions", "ease of use", "highlighting the importance of continuous use", "adjustment to work site conditions", "presenting simple and low-cost solutions", "increasing knowledge", "utilizing the ACL as a positive training tool", "sharing practical experience in group work", "increasing productivity", "identifying necessary improvement actions", and "strengthening collaboration".

Utility of ACLs

The questionnaire responses obtained from the 40 trainers indicated that they generally acknowledged that the ACLs had a high utility. The degree of the utility of ACLs, as determined by the trainers, was compared between countries; as shown in Table 2. There were no significant differences found in the perceived utility of ACLs between the three groups of participants. Responses were firmly positive with total score of 90.35 (± 7.58) across all items and an average score of 4.52 for each individual item. The total of the utility scores based on responses to the 20 questions were slightly lower for Korea (89.74 ± 12.92) and other countries (88.95 ± 10.13) when compared with those from Japan (91.17 ± 11.77). These differences were

Table 1. Key statements expressing features enhancing the utility of the ACL taken from interviews with trainees

Thematic clusters	Meaning statements
A Utilizing the ACL as an action-oriented training tool for proposing improvement actions	1. We found good points and points for improvement 2. It assists us in identify points for improvement 3. It made us to act naturally to improve
B Ease of use	4. It is easy to understand the meanings of the illustrations 5. We only need to check 'Yes', 'No' or 'Priority' without having to provide a full description 6. It is so simple that you can use it even if you are new to the job
C Highlighting the importance of continuous use	7. We want to continue to share good points and points for improvement 8. We will use it continually otherwise we will forget it 9. It is there to protect us from accidents in the workplace
D Adjustment to work site conditions	10. We left a blank in the ACL for workers to add new ones in case it is needed in their section 11. A doorsill is needed for the disabled children but it has to be removed for elderly users 12. The updated ACL is important because conditions on the work site change frequently
E Presenting simple and low-cost solutions	13. We proposed an idea to assemble a low-cost toluene ventilation system 14. We decided to fabricate a doorsill with wood for disabled children 15. We learned how important the unused machinery cover was
F Increasing knowledge	16. We can now identify points for improvement 17. We were aware of improvements even when they were incremental 18. We realized how important the unused machinery cover was
G Utilizing the ACL as a positive training tool	19. Inspectors come once a year and they just send us the results by mail 20. Inspectors always point out the bad points but we wanted them to provide us with encouragement 21. Inspectors are like policeman with regards to laws and regulations
H Sharing practical experience in group work	22. We exchanged our opinions in groups 23. We shared examples of good practice during group work with another department 24. We wanted to share our successes with others
I Increasing productivity	25. We don't know whether it is linked to expand production 26. It is unclear how this activity is profitable 27. The construction site changes so often that it is impossible to measure productivity
J Identifying necessary improvement actions	28. We assembled a new toluene ventilation system. 29. We made the doorsill for disabled children to aid their cognitive development 30. We used the machinery cover and to ensure users' safety
K Strengthening collaboration	31. Our coworkers already had strong relationships but it made us stronger 32. The results depend on whether the manager has an interest in the ACL 33. The way the ACL is used is more important than its role in strengthening collaboration

not significant, however. The lowest mean values from Japan (3.89 ± 0.93) and Korea (4.00 ± 1.08) was found on the item "creating links with management goals". The lowest mean values for the other countries (4.12 ± 0.35) were for the item "generating practical solutions" and "working in groups". Japanese respondents gave a slightly lower mean score for the item "easy to use" (4.15 ± 0.60) when compared with other items. In Korea, responses to the items "promoting active involvement" (4.07 ± 0.64)

and "broadening the scope" (4.15 ± 0.98) gave slightly lower mean values than for other countries. Among all the items included in the survey, the highest mean score across all countries was for "highlighting the importance of adjusting to local conditions" (4.87 ± 0.40).

Factors relating to the utility of ACLs

We conducted a factor analysis to identify the factors underlying the utility of ACLs (Table 3). Our analysis

Table 2. Agreement on the degree of the utility of the ACL by country (n=40)

Item	Japan (19)		Korea (13)		Others (8)*		Total (40)		F	P
	M	SD	M	SD	M	SD	M	SD		
1. Proposing improvement actions	4.84	0.37	4.69	0.48	4.50	0.53	4.72	0.45	1.72	0.19
2. Training people	4.84	0.37	4.69	0.48	4.62	0.51	4.75	0.43	0.96	0.39
3. Finding necessary improvement in multiple aspects of work	4.68	0.67	4.53	0.66	4.37	0.51	4.57	0.63	0.94	0.39
4. Emphasizing low-cost solutions	4.84	0.68	4.53	0.77	4.87	0.35	4.75	0.66	0.49	0.61
5. Ease of use	4.15	0.60	4.53	0.66	4.25	0.70	4.30	0.64	0.17	0.84
6. Assisting in finding points for Encouraging improvements using trainee's own methods	4.52	0.51	4.38	0.65	4.25	0.46	4.42	0.54	0.97	0.38
7. Generating practical solutions	4.47	0.69	4.46	0.66	4.12	0.35	4.40	0.63	0.48	0.61
8. Promoting active involvement	4.21	0.63	4.07	0.64	4.37	0.74	4.20	0.64	0.51	0.60
9. Working in groups	4.57	0.50	4.53	0.66	4.12	0.35	4.47	0.55	2.35	0.10
10. Providing opportunities to share experiences	4.42	0.69	4.53	0.66	4.25	0.46	4.42	0.63	0.49	0.61
11. Highlighting the importance of adjusting to local conditions	4.94	0.22	4.84	0.37	4.75	0.70	4.87	0.40	0.70	0.49
12. Presenting ways of implementing simple improvements	4.52	0.84	4.30	0.75	4.37	0.51	4.42	0.74	0.34	0.71
13. Using the ACL as an action-oriented training tool	4.78	0.41	4.76	0.43	4.87	0.35	4.80	0.40	0.17	0.84
14. Basing actions on local good practice	4.73	0.56	4.30	0.75	4.25	0.46	4.50	0.64	2.71	0.08
15. Promoting learning by doing	4.42	0.76	4.69	0.63	4.75	0.46	4.57	0.67	0.95	0.39
16. Broadening the scope	4.52	0.61	4.15	0.98	4.37	0.51	4.37	0.74	0.97	0.38
17. Encouraging an exchange of experience	4.36	0.68	4.38	0.65	4.37	0.51	4.37	0.62	0.00	0.99
18. Creating links with management goals	3.89	0.93	4.00	1.08	4.25	0.46	4.00	0.90	0.42	0.66
19. Applicability for use in future activities	4.84	0.37	4.69	0.48	4.75	0.46	4.77	0.42	0.48	0.61
20. Recommendation for use in future Training	4.63	0.68	4.69	0.48	4.50	0.75	4.62	0.62	0.22	0.80
Total	91.17	11.77	89.74	12.92	88.95	10.13	90.35	7.58	0.28	0.75

* Others; Vietnam, Cambodia, Thailand, Russia

Table 3. Factor loadings for five factors identified using factor analysis

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
01. Proposing improvement action	0.67	0.33	0.22	0.31	-0.22
05. Ease of use	0.52	0.20	0.09	-0.19	0.27
11. Highlighting the importance of adjusting to local conditions	0.75	0.29	0.03	-0.13	0.15
13. Using the ACL as an action-oriented training tool	0.76	0.14	-0.01	0.23	-0.02
19. Applicability for use in future activities	0.71	0.12	0.29	0.06	0.31
20. Recommendation for use in future training	0.75	-0.03	0.10	0.30	0.17
04. Emphasizing low-cost solutions	0.46	0.71	0.10	-0.25	0.24
07. Generating practical solutions	0.16	0.49	0.20	0.37	0.45
12. Present ways of implementing simple improvements	0.16	0.84	0.06	0.29	0.21
14. Basing actions on local good practice	0.30	0.77	0.28	0.14	0.02
16. Broadening the scope	0.04	0.80	0.33	0.19	0.11
02. Training people	0.40	0.48	0.51	0.25	-0.38
09. Working in groups	0.10	0.17	0.77	0.10	0.02
10. Providing opportunities to share experiences	-0.03	0.15	0.60	0.43	0.18
17. Encourage an exchange of experience	0.14	0.06	0.77	0.19	0.11
18. Creating links with management goals	0.10	0.27	0.72	-0.21	0.26
03. Finding necessary improvement in multiple aspects of work	0.17	0.24	0.19	0.83	-0.02
06. Encouraging improvements using trainee's own methods	0.27	0.34	0.44	0.49	0.12
08. Promoting active involvement	0.10	0.27	0.24	0.26	0.74
15. Promoting learning by doing	0.39	0.10	0.15	-0.20	0.73
Eigen value	8.05	2.25	1.74	1.41	1.10
Cumulative %	19.03	37.06	52.58	62.90	72.84

Table 4. Correlations between the five factors identified

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 2	0.54**			
Factor 3	0.40**	0.56**		
Factor 4	0.47**	0.58**	0.57**	
Factor 5	0.47*	0.52**	0.41**	0.30

* $p < 0.05$, ** $p < 0.01$ F₁=ease of application; F₂=formulating practical solutions; F₃=group interaction; F₄=multifaceted perspective; F₅=active involvement

showed that all five factors identified were valid. The 20 survey items were meaningfully categorized into these five factors — which were found to account for 72.84% of the variance. The factor loadings were similarly high for each of the five factors with values between 0.49 and 0.84. Six items were categorized within Factor 1 and five were categorized within Factor 2 and Factor 3. Two of the survey items were categorized within both Factor 4 and Factor 5. It was notable that each of the five factors comprised items with high factor loadings. The highest factor loadings were 0.75 for Factor 1, 0.84 for Factor 2, 0.77 for Factor 3, 0.83 for Factor 4 and 0.74 for Factor 5.

The factors defined in our analysis were labelled to indicate which dimensions of the ACLs' utility they corresponded to. Factor 1 was defined as “easy application”, Factor 2 as “formulating practical solutions”, Factor 3 as “group interaction”, Factor 4 as “multifaceted perspective” and Factor 5 as “active involvement”. These factors clearly conformed to both the design principle of the ACLs employed and their real-world patterns of use.

The Pearson Correlation Coefficients showing the relationship between the factors identified in our analysis are shown in Table 4. While we did not find any statistically significant correlation between Factors 4 and 5, we found statistically significant ($p < 0.01$) correlations between Factor 1 and Factor 2, 3, 4 and 5, between Factor 2 and Factors 3, 4 and 5, and between Factor 3 and Factors 4 and 5 with coefficients in the range of 0.40–0.58. These results suggest that the relationships between these five factors were not fully independent.

By referring to the results of the factor analysis, we were then able to classify the 11 thematic clusters used to group trainees' responses into five corresponding categories (Table 5). These categories were considered to indicate the degree to which trainees agreed that the ACL is an “easy-to-use training tool adjusted to local conditions”, and that its application “broadens the scope to present simple improvements”, “encourages an exchange of

experiences to link with management goals”, “encompasses multiple aspects of work” and “promotes active involvement”.

These five thematic areas identified in the interviews with expert trainers closely corresponded with the factors found in our factor analysis. While the thematic area “easy-to-use training tool adjusted to local conditions” corresponded with Factor 1 (defined as “easy application”), “broadens the scope to present simple improvements” matched Factor 2 (“formulating practical solutions”), “encourages an exchange of experiences to link with management goals” Factor 3 (“group interaction”), “encompasses multiple aspects of work” Factor 4 (“multifaceted perspective”) and “promotes active involvement” Factor 5 (“active involvement”).

Key statements identified by expert trainers

The twenty eight key statements identified from the questionnaire responses given by the expert trainers are shown in Table 6. These were grouped into five themes which comprised “agreement with the utility of the ACL”, “ideas to promote active involvement”, “methods for finding examples of good practice”, and “advice for linking with management goals”. The trainers agreed that ACLs could aid in enhancing consensus building among trainees. They also highlighted the importance of developing skills to promote active involvement and encouraging trainees to find their own examples of good practice based on their experience using ACLs. Finally, the expert trainers also responded with advice for linking their use with management goals and for broadening the scope of their use.

Discussion

The PAOT methodology emphasizes building on local good practices, applying low-cost improvements and the use of action-oriented training tools as a continuous, iterative process^{2, 3, 8, 9, 11}). These practical and easily-adaptable training tools for application in PAOT workshops can therefore play a role in involving trainees in proposing, implementing and sustaining improvement actions in the workplace. It also emphasizes capitalizing on local wisdom and knowhow when designing practical improvements for better workplace conditions when used as part of action-oriented, stepwise training activities^{3–7, 16}). An ACL can play a key role as a training tool for trainees to identify practical solutions (Fig. 1). There is also immense value in informing occupational safety and health professionals, researchers and policymakers alike on the effec-

Table 5. Relations between the five factors based on the questionnaire results and the 11 thematic clusters for grouping trainees’ statements

Factors	Theme category	Thematic areas
F ₁ : Ease of application	Easy-to-use training tool adjusted to local conditions	A: Utilizing the ACL as an action-oriented training tool for proposing improvement actions B: Easy-to-use C: Necessity of continuous use D: Adjusting to work site conditions
F ₂ : Practical solutions	Broadens the scope to present simple improvements	E: Presenting simple and low-cost solutions F: Increasing knowledge
F ₃ : Group interaction	Encourages an exchange of experiences to link with management goals	G: Use of the ACL as a positive training tool H: Sharing practical experience in group work I: Increasing productivity
F ₄ : Multifaceted perspective	Encompasses multiple aspects of work	J: Identifying necessary improvement actions
F ₅ : Active involvement	Promotes active involvement	K: Strengthening collaboration

Table 6. Overarching themes extracted from key statements obtained from expert trainers

Theme	Key statements
Agreement with the utility of the ACL	1. It is simple and easy to reach consensus in making actions 2. It encourages trainees to find both the good points and for improvement 3. Continuous use is important – so be patient and don’t expect immediate results! 4. Trainees are not familiar with the discussion surrounding the use of the ACL
Ideas to promote active involvement	5. There should be fewer than 40 checklist items 6. Trainees should be acknowledged and encouraged 7. Ensure that responses to trainees are polite and respectful 8. Trainers must be reminded that this is a trainee-centered tool 9. Trainers must have a passion to facilitate 10. Facilitating skills development through activities such as games and role-play scenarios is important. 11. Classrooms should be rearranged to optimize the atmosphere and improve delivery of training 12. Although this is a participatory program it is not always easy to achieve full involvement of the trainees 13. Trainees should be reminded not to rely on the ACL but to exchange opinions with others
Methods for finding examples of good practice	14. The positive aspects should be identified first 15. Trainers have to change workers’ perspectives on their own working conditions 16. It is important to identify key people locally to find examples of local good practice 17. Don’t try to aim for perfection at all times 18. There are already many good points 19. Show many examples of good practice to the trainees 20. Visit the workplace before implementing the ACL
Advice for linking training with management goals	21. Government support is needed 22. There is no objective data for measuring productivity increases 23. A cost-benefit analysis is needed 24. There is a lack of understanding of the programs objectives on the part of the manager 25. Motivation and work satisfaction contribute to high productivity
Methods for broadening the scope	26. Follow-up activity is important 27. Trainees already know examples of good practice when exchanging ideas 28. This is a step-by-step process – so don’t rush things!

tive use of ACLs for building consensus and improving working environments in a range of settings. The practical

insights regarding the use of ACLs identified by this study may be of use in addressing this question.

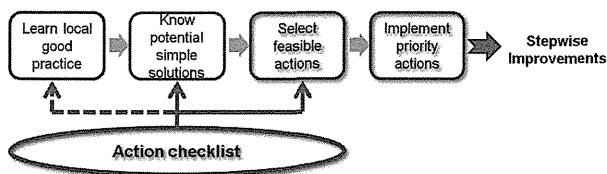


Fig. 1. Steps taken in PAOT programs in relation to the use of an action checklist.

A previous study has described the features common to all PAOT ACLs, which included 1) direct reference to checkpoints that could be used directly as an action-oriented training tool, 2) presenting ways of making simple improvements reflecting basic ergonomic principles, and 3) designing action items based on good practices to suggest locally feasible actions^{7,9}. The present study revealed five factors which could form a basis upon which the utility of ACLs could be measured. First, each ACL is, on a fundamental level, a simple and training tool adjusted to local conditions. Precious work by Kogi has highlighted that it is an action-oriented training tool for assisting trainees in finding points for improvement¹⁹. Meanwhile, Kawakami has also emphasized that photo sheets with examples of good practice can provide clear guidance for trainees regarding workplace procedures and management priorities¹⁷. In other words, by implementing direct improvement actions, each trainee is encouraged to improve working conditions, and, where necessary, make updates to the ACL as part of a continuous, stepwise process^{11,20}. The key statements identified as part of our study included “the action checklist help identify points to be improved”, “it is easy to understand the meanings of the illustrations” and “we left a blank items in the ACL for workers to add new ones in case it is needed in their section”. These statements were representative of the ‘easy application’ theme – as shown using factor analysis. The priority implicit within this theme is to propose improvement actions. By updating and adjusting its content to specific needs at different work sites, ACLs may be used in a continuous fashion to create momentum for progress and further improvement^{21,22}. As a general point, recognition of the importance of locally adjusted action-oriented training tool tends to contribute to the total utility of ACLs. Our results confirmed that this held true in a range of Asian settings (4.87 ± 0.40). This result also implies that the easy application of ACLs varies by country and is dependent on local socioeconomic factors as well as occupational safety and health policy on the national level and the effectiveness of workplace risk management. However, this

also appears to confirm our hypothesis that ACLs when adapted to local conditions, can be similarly effective in promoting consensus building across a number of Asian countries despite differences with regards to social and economic conditions and overall inequities in occupational safety and health.

ACLs can also be instrumental in broadening the scope and presenting simple workplace improvements in an easy-to-understand way. Previous studies in this area have focused on low-cost solutions based on the local good practice^{7–11,15,16}. Their results have shown that ACLs also present avenues for practical improvement in a broad range of technical areas^{11,13,20–22}. The key statements identified by the present study also included “we proposed an idea to assemble a low-cost toluene ventilation system” and “we learned how important the unused machinery cover was”. These statements corresponded with the “practical solutions” factor which emphasized finding simple, low-cost solutions and increasing trainees’ knowledge.

Furthermore, ACLs promote an exchange of experiences to link workplace improvements with management goals. By facilitating group discussions, ACLs encourage of the articulation of different viewpoints, allowing participants to reach a consensus in a timely manner and to identify priority actions^{2,19}. This is important given that low productivity and poor quality of work are often the result of hazardous workplace conditions and a lack of effective organization. Previous work has also shown that productivity is enhanced when conditions in the work place are improved¹³. One key statement identified in the present study, which encapsulated the “group interaction” factor, was “during group work with other department, we shared good examples”. However, given the relatively high rate of agreement with the statement “we don’t know whether it is linked to expand production”, it was unclear whether encouraging exchanges of experience through group discussion could be directly linked to high productivity.

ACLs also cover multiple aspects of the trainees’ work, and could therefore be of value in encouraging them to evaluate their own working conditions in multiple technical areas to identify effective action points and appropriate solutions for workplace improvement². In our study, the key statement in this area was “we made the doorsill for disabled children to aid their cognitive development”; which represents the “multifaceted perspective” factor. Finally, ACLs promote active workplace involvement and in previous studies checklists and so on have been designed to achieve participation from both employers and employ-

ees alike^{5, 13, 16}). Our results therefore suggest that “ideas to promote active involvement” is the most important of the themes identified from the ACL for promoting workers’ involvement. Moreover, the use of ACLs encourages an exchange of experiences¹¹).

Another key statement identified was “the results depend on whether the manager has an interest in the ACL”. This statement fell under the “active involvement” factor, and emphasizes the fact that ACLs should be designed with both employers and employees in mind as both play an instrumental role in facilitating improvement actions. ACLs are also useful in providing a structure for group work and encouraging workers to exchange examples of good practice^{6, 20}). This may imply that the “group interaction” factor is pivotal for promoting trainees’ active involvement. To ensure this, trainers should have knowledge in the relevant technical area, experience in implementing low-cost solutions and the ability to engage trainees and secure their active involvement²³).

The present study pinpointed a number of positive messages regarding the real-world utility of ACLs, in addition to lessons for their future development as a training tool for stimulating improvements in workplace environments. Despite this, utility scores for key statements relating to linking with management goals and promoting active involvement were found to be relatively low – particularly in Korea and Japan. However, we were not able to assess how management goals could be incorporated into the use of ACLs; particularly in settings where processes are already in place to measure their utility. This could indicate that practical applicability of the “group interaction” factor may be less flexible and that its outcomes may be determined by the social and economic context, occupational safety and health policies on the company level and the goals of management at the work site. One possible cause of this may be the burden for both employees and employers in implementing ACLs, as is especially the case in Japan and Korea. Trainers are also faced with a lack of awareness on the part of employers regarding the benefits of improved working conditions. This issue could potentially be resolved, however, by presenting objective evidence, such as cost-benefit analyses, to convince both employer and employee that the use of ACLs has a positive impact on productivity. If this is not practically feasible in a given setting, however, efforts should be made to identify relevant case studies, and if necessary, carry out a cost-benefit analysis on-site. Given that employers play a decisive role in facilitating improvement actions, efforts to increase awareness of the benefits of ACLs are most likely

to provide impetus for improving working conditions. This suggests that simplifying their use and reducing their burden on employers may facilitate greater involvement on the part of the employee if employers consider such programs a constructive use of working hours.

This study showed no statistically significant differences in mean scores for the utility of the ACLs between countries. The degree of utility of the ACLs, as measured using the survey responses, was found to be high across the majority of survey items and across different Asian countries. These results may imply, therefore, that ACLs may be an effective tool for consensus building regardless of the setting.

The present study has some limitations, however. First, we were able to recruit only eight trainees for the in-depth-interviews – thereby reducing the reliability of our results. Additionally, there were other important factors which we could not adjust for such as job category. Finally, our analysis was limited to the positive aspects of ACLs and did not cover any of the negative aspects which may hinder their real-world utility.

Conclusion

Our results revealed that both trainees and trainers made effective use of ACLs in their participatory training activities as an effective means of facilitating the participatory process and improving both working conditions and the workplace environment.

The ACLs presented in this study are likely to be most effective in real-world practice when they are adapted to local conditions and make reference to local knowhow and examples of good practice. Our factor analysis of the questionnaire responses identified five factors relating to the utility of the ACL. These factors indicated that “ease of application”, “practical solutions”, “group interaction”, a “multifaceted perspective” and “active involvement” are instrumental for the successful application of these ACLs in real-world contexts.

The present study shows that ACLs based on practical improvements can be applied in local settings in multiple aspects of work, and that they are particularly useful for enhancing participatory training programs. Situation-specific design and effective use of ACLs is essential for building active interest in implementing immediate improvements in a wide range of workplace scenarios.

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EVALUATION OF PARTICIPATORY TRAINING IN MANAGING MENTAL HEALTH FOR SUPERVISORY EMPLOYEES IN THE FINANCIAL INDUSTRY

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ABSTRACT

Industry-specific primary prevention measures for promoting mental health of workers were undertaken in 2008 and 2009 as a result of participatory training involving 130 supervisory employees in workplaces of the financial industry. These measures included the following five points suggested to be effective in the industry: 1) proper opportunities for training and career building, 2) control of work time and improving work organization, 3) standardization of tasks, 4) job rotation for sharing work responsibilities, and 5) increasing communication and mutual support. A post-training follow-up survey revealed that participatory, action-oriented training facilitated sharing of feasible measures and mutual support, leading to the development of measures easily introduced and established at each workplace. We concluded that mutually supportive group work of teams composed of members who held similar duty positions and were engaged in similar operations, using the Mental Health Action Checklist as a guiding tool, was effective for realizing implementation of optimally practical and specific measures.

INTRODUCTION

Interventions for improving workplace environments have proven effective for occupational stress reduction as means of primary prevention (Egan et al., 2007; Kompier, 2001; Lamontagne, et al., 2007). Attempts aimed at improving workplace environments have a wide range of targets including improvement of the workplace layout, improvement of operational procedures, activation of teamwork or small group activities, and arrangement of operational rotations (Lamontagne et al., 2007). Interventions which are reportedly effective not merely exert effects on behaviour change and amelioration of symptoms, but also focus on redesigning the workplace and the working environment to eliminate factors that may induce diseases (Egan et al., 2007). These interventions can be carried out by anyone, not necessarily an expert. Characteristically, these interventions are implemented with an emphasis placed on the systematic approach by which the organization provides employees with opportunities to learn (Lamontagne et al., 2007). In Japan, some intervention studies have addressed workplace environments, with attention to stress management by means of improving the workplace environment (Kawakami et al., 1997; Kobayashi et al., 2008; Tsutsumi et al., 2009). Improvement of the workplace environment has been applied to work sites of various industries, because it directly deals with psychosocial factors related to occupational stress. Similar interventions are spreading over a wide variety of workplaces, and considered to provide more sustainable effects than those applying individual-oriented approaches (Karasek, 2004; Kompier, 2001). Interventions focusing on improving workplace environments are cost-effective, as compared with various other measures for dealing with occupational stress (Eguchi et al., 2012).

The intervention tool adopted is important in the implementation of primary prevention measures for occupational stress through improvement of workplace environments (Kogi, 2012; Leka et al., 2011). For

instance, there is the Mental Health Action Checklist (MHACL), which was developed as a tool for improving workplace environments as a means of addressing the mental health of workers (Yoshikawa et al., 2007). In intervention studies using such intervention tools in the workplace, poor mental health was improved significantly (Kobayashi et al., 2008; Tsutsumi et al., 2009). These interventions are currently adopted in various ways by securing appropriate opportunities for training and career building, improving work time arrangements and work organization, increasing communication and mutual support, etc. Therefore, when planning occupational stress primary prevention measures through improving workplace environments, choosing the intervention tool suitable for the characteristic features of the workplace and its effective application should be sufficiently taken into account.

When formulating the primary prevention measures against occupational stress, it is important to define the target of intervention (Kompier, 2001; Leka et al., 2011). Supervisory employees are usually key persons who can control occupational stress affecting rank-and-file employees. Supervisory employees play an important role in primary prevention of occupational stress (Tsutsumi, 2010). Among other management capabilities, supervisory employees are required to be able to carry out planning of occupational stress measures at each workplace based on accurate knowledge about mental health (Takao et al., 2006). In this regard, it is necessary to consider the contents of training programmes for supervisory employees, tailoring these activities to suit the conditions of each workplace.

Various intervention programmes tailored to the features of the workplace have been reported (Hassard, 2011; Leka et al., 2011). These programmes include those aimed at manufacturing workers (Kawakami et al., 1997; Kobayashi et al., 2008; Tsutsumi et al., 2009), civil-service employees (Bond and Bunce, 2001; Orth-Gomér et al., 1994), postal employees (Mikkelsen and Saksvik, 1999), and healthcare service workers (Bourbonnais et al., 2006; Mikkelsen et al., 2000). In contrast, there have been few reports addressing improvement of workplace environments aimed at preventing occupational stress in workers dealing with information and intangible services such as finance. In particular, in job types characterized by special information that is apt to depend on individual capacity, occupational stress primary prevention measures can be devised by implementing and evaluating the training of supervisory employees addressing practical anti-stress measures derived from improvement of the workplace environment, including those for coping with occupational stress factors involving communication support and career building. To identify effective types of stress-reducing measures, it is necessary to assess the applicability of occupational stress intervention suited to job characteristics.

Therefore, we investigated differences in the actions proposed for improving workplace environments, with the aim of preventing occupational stress among supervisory employees of the financial industry. Effective training programmes for such employees in this industry are discussed.

METHODS

Study design

This study had a quasi-experimental design in which the effect of participatory intervention for workplace improvement among supervisory employees was examined. Participatory training in managing mental health for these employees was conducted in 2008 and 2009. Results of group discussions in the training and implementation actions for improving working environments by using the Mental Health Action Checklist (MHACL) were reviewed six months after the training. A new version of the MHACL was designed for direct use by supervisory employees working for a financial institution with 970 full-time employees. An occupational health staff team tasked with improving occupational safety and health in the institution studied existing and potential preventive measures and selected those suitable for consideration by the supervisors.

Subjects

This study was conducted at a health insurance company that develops products pertaining to health insurance and provides health insurance related services. The subjects were 130 full-time supervisory em-

ployees who were working at two workplaces, A and B. Four workshops were conducted from February to March 2008 in which a total of 119 supervisory employees participated. There were 116 men and three women, with a mean age of 44 years (standard deviation 7.9 years). In total, 68 and 42 persons worked at sites A and B, respectively, while nine did not provide information about their work sites. Workplace A dealt mostly with planning jobs, and workplace B dealt mostly with routine tasks such as receiving documents from customers, agreement confirmation, and sending documents to customers. In 2009, four similar workshops were carried out, and 120 supervisory employees participated.

Intervention

In the training, the team-based, problem-solving intervention used in the current study was based on active supervisory employee involvement, shared work-related goals, and action planning to improve the work environment so as to achieve stress reduction. The first participatory workshops were conducted using the MHACL, composed of 24 countermeasure items aimed at job stress reduction, in February 2008, and the second workshops were held using case studies in addition to the MHACL in February 2009. The MHACL used in this study was a modification (Yoshikawa et al., 2007); it was prepared by occupational health nurses and industrial health staff in the target workplaces. The new version was comprised of 24 action items that corresponded to workplace measures for reducing psychosocial stress at work in five technical areas (Table 1).

Table 1. Technical areas commonly applicable to job-stress reduction in the mental health action checklist (MHACL) adjusted to the financial industry.

Action areas	No. of items	Examples of checklist items
A Participation in work planning and sharing of information	5	Group planning, limited workload, sharing information, etc.
B Improving working time arrangements and work organization	5	Non-overtime day, shift schedule, flexible and resting hours, facilities, etc.
C Ergonomic work methods and workplace physical environment	6	Materials handling, labels, avoiding mistakes, emergency smoking controls, etc.
D Mutual support at work	4	Supportive climate, newsletter, e-mail, proper training
E Preparedness and care	4	Counseling, self-care, primary care, predictability, etc

Figure 1 shows the study design. The first session of participatory training, a 120-min workshop, was carried out at workplaces A and B in 2008. In each workshop, participants learned from a 45-minute pres-

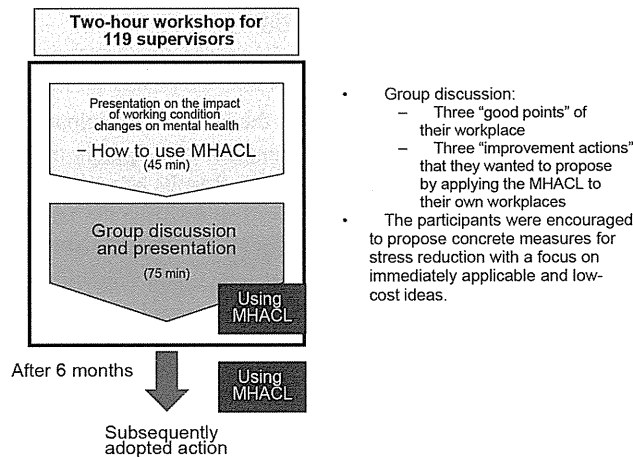


Fig.1. Participatory training program for supervisors in the financial industry in 2008.

1. Hold regularly a short meeting before work of the staff member of a section about the work schedule of the day.			
Do you propose this action?			
<input checked="" type="checkbox"/> No, I don't propose	<table border="1"> <tr><td>priority</td></tr> <tr><td>A B C</td></tr> </table>	priority	A B C
priority			
A B C			
<input type="checkbox"/> Yes, I propose			
Remarks: _____			

Fig.2. An example of a mental health action checklist item in the area of "participation in work planning".

entation about the role of primary prevention in mental health issues and practical workplace improvements applicable to the financial services sector. Subsequently, group discussions and presentations of the results were carried out during a period of 75 min. Participants first conducted a checklist drill and their personal work, and were then divided into groups of five to seven members to hold group discussions. These group discussions had the task of identifying three "good features" of their workplaces and three "improvement actions" that they wanted to propose by applying the MHACL to their own workplaces. The participants were encouraged to propose concrete stress reduction measures with a focus on immediately applicable and low-cost ideas. The results of checklist application and group proposals were evaluated. Each group carried out a workshop with the same contents.

Outcomes

The following two primary outcomes were adopted: actions proposed through the workshop using MHACL and changes resulting from the implementation of these actions. The study also evaluated changes in the rates of the proposed items from the MHACL six months after the workshops by applying questionnaires. The data were analyzed using the Chi square test.

Ethical considerations

This study was designed by occupational health staff members at the target workplaces, and implemented after review by the in-house safety and health committee. The results obtained were compiled and analyzed while maintaining the confidentiality of all participating individuals. Occupational health staff members who conducted the participatory training informed the way of the use of results of groupwork to participants of each workshop in both the document and oral before workshop. They also explained in both the document and oral that there is no disadvantage in that you do not answer to the questionnaire. Furthermore, consent for publication of useful data was obtained prior to conducting the study.

The use of results

The information and results of workshop waer kept strictly confidential and used purely for improving. Before participatory training workshop, occupational health staff inform participants information will not be use against you in any way and will not interfere with normal care you receive here in future. The result of the analysis of the information you will give will not enable a third party to identify you.

RESULTS

Existing good practices and proposed measures

By applying the checklist, the participating supervisory employees pointed out many items corresponding to existing good practices, and proposed a number of new measures. The items checked by individual supervisors served as useful inputs in the subsequent group discussions. The average percentage of participants who checked "Yes" as to corresponding items in each area is shown in Table 2. We analyzed

110 checklist results obtained from 119 participants in the four workshops held in 2008, and 120 checklist results from 120 participants in the four workshops held in 2009.

On average, the participants proposed 13.9 items for immediate implementation. The proposed items included a broad range of measures. Among the five areas, measures relating to "ergonomic work methods and workplace environment" were the most frequently proposed in 2008, followed by those relating to "preparedness and care". A comparison of the results obtained in 2008 and 2009 showed that the proportion giving the answer "Yes", in response to a proposal, was somewhat lower in 2009 than in 2008.

Table 2. The number and proportion (%) of checklist items with "Yes" as the response of participating supervisory employees (n=110, two workshops in 2008, n=120, two workshops in 2009) to a proposal.

Category	In 2008 (n=110)			In 2009 (n=120)		
	No. of checked items	No. of employees with "Yes" in each category	%	No. of checked items	No. of employees with "Yes" in each category	%
A Sharing work planning	151	76/110	(69.1)	220	84/120	(70.0)
B Work time and organization	168	77/110	(70.0)	213	73/120	(60.8)
C Ergonomic work methods and workplace environment	279	94/110	(85.5)	295	87/120	(72.5)
D Mutual support at work	196	89/110	(80.9)	236	88/120	(73.3)
E Preparedness and care	222	93/110	(84.5)	242	87/120	(72.5)

As measures already being practiced, the participants mentioned likewise a broad range of items, such as "hold a meeting before work to plan the work schedules" (mentioned by 87%), "use a notice board to provide correct information to all workers" (79%) and "ask each small work group to decide how to do their work" (75%). In contrast, the items proposed for immediate implementation were concentrated on teamwork arrangements and mutually supportive measures involving supervisors. Typically, proposed items included "organize training for learning self-care" (mentioned by 66%), "make sure workers feel at ease in consulting the boss" (63%) and "make workplace layout and workstations easy to use" (54%). Group discussions led to the similarly practical measures shown in Table 3. Most of these measures were confirmed to be useful for developing appropriate teamwork procedures, job skills training, career building support and communication routes.

Table 3. Typical stress-reducing measures proposed by group discussions of supervisory employees*

Typical measures proposed during group work	Examples
1) Proper opportunities for training and career building	Providing proper employee training; training and job support for mid-career workers
2) Control of work time and improving work organization	Setting target hours for work and fixing "non-overtime days"; flexible work hours to accommodate personal needs
3) Standardization of tasks	Developing manuals for work procedures; clarifying the purpose of each job
4) Job rotation for sharing jobs	Increasing multi-skilled jobs to raise sense of success; re-arranging tasks so as to avoid excessive workloads
5) Increasing communication and mutual support	Establishing a climate in which co-workers can consult with each other; Ensuring that each worker receives proper feedback about work.

*Four workshops held in 2008 and 2009. Numbers of groups in the 1st, 2nd, 3rd and 4th workshops were 4, 6, 4 and 6, respectively.

The results obtained from the evaluation sheets indicated that two-thirds of the participants were satisfied with the group work results and the participatory workshop. Some participants felt the need to provide more information about managing individual mental health cases.

Figure 3 shows the results of the post-training questionnaire inquiring about the effectiveness of the training. About 70% of the participants replied that the training was effective.

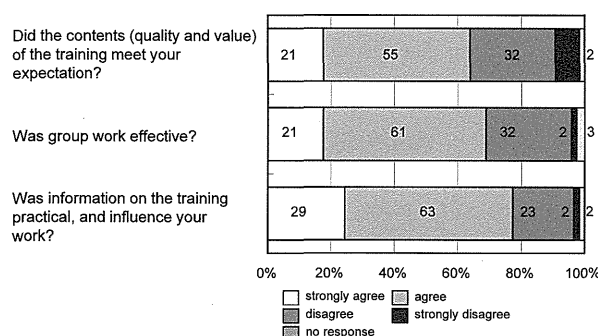


Fig.3. Evaluation of group work results in improving mental health (n=119).

Follow-up evaluation six months after the workshops

Table 4 shows the follow-up evaluation six months after proposal of the examples that were (1) improvements carried out and considered to be effective, and (2) those that were carried out but not deemed to be effective. Respondents were 38 of the 119 participants in the four workshops held in 2008. The measures already taken included securing rest breaks, establishing a system for consulting the boss, and readjustment of project master plans. All 38 respondents had taken certain actions after they participated in the training programme. The newly carried out improvement activities covered a broad range, with the following being frequent: making information known to everybody, securing working space, and ensuring opportunities for on-the-job training and education. Although activities carried out after training and eval-

Table 4. Six-month follow-up evaluation of proposed improvement activities. Top three actions already taken prior to participation in the workshop program and top three actions taken after participation in the workshop program.

	Prior to training and effectiveness				Carried out after training and effectiveness									
	Already done n=38		Effective		Not effective		Unknown, no answer		Newly done n=38		Effective		Not effective	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
1 Holding periodic brief section meetings on scheduling tasks	22	(57.9)	14	(63.6)	2	(9.1)	6	(27.3)	5	(13.2)	4	(80.0)	1	(20.0)
2 Redistributing tasks by group discussion to avoid excessive loads	27	(71.1)	21	(77.8)	0	(0.0)	6	(22.2)	7	(18.4)	7	(100.0)	0	(0.0)
3 Rearranging tasks to allow sense of accomplishment and operability	27	(71.1)	22	(81.5)	0	(0.0)	5	(18.5)	3	(7.9)	3	(100.0)	0	(0.0)
4 Using a notice board to be used by each team for informing all workers of the team correctly	24	(63.2)	16	(66.7)	2	(8.3)	6	(25.0)	10	(26.3) *	10	(100.0)	0	(0.0)
5 Preparing against sudden urgent tasks	17	(44.7)	12	(70.6)	1	(5.9)	4	(23.5)	4	(10.5)	4	(100.0)	0	(0.0)
6 Setting work schedules to avoid overtime/excessive working hours	17	(44.7)	13	(76.5)	4	(23.5)	0	(0.0)	5	(13.2)	3	(60.0)	2	(40.0)
7 Adjusting tasks in advance to prepare for the busy period	21	(55.3)	14	(66.7)	3	(14.3)	4	(19.0)	4	(10.5)	4	(100.0)	0	(0.0)
8 Rescheduling working hours to avoid successive late-night shifts and irregular working hours	22	(57.9)	15	(68.2)	3	(13.6)	4	(18.2)	4	(10.5)	4	(100.0)	0	(0.0)
9 Considering adjustment of working hours to meet the individual's needs	29	(76.3)	23	(79.3)	2	(6.9)	4	(13.8)	8	(21.1)	8	(100.0)	0	(0.0)
10 Securing rest breaking without feeling constraints	35	(92.1) *	25	(71.4)	0	(0.0)	10	(28.6)	7	(18.4)	7	(100.0)	0	(0.0)
11 Facilitating smooth and efficient handling of goods, documents, and/or materials	21	(55.3)	13	(61.9)	2	(9.5)	6	(28.6)	7	(18.4)	5	(71.4)	0	(0.0)
12 Improving of personnel computer environment including chairs, the mouse and keyboard in a proper layout	21	(55.3)	16	(76.2)	1	(4.8)	4	(19.0)	7	(18.4)	6	(85.7)	1	(14.3)
13 Keeping the computer desk tidy, maintaining files and goods so as to secure the working space	26	(68.4)	18	(69.2)	2	(7.7)	6	(23.1)	9	(23.7) *	9	(100.0)	0	(0.0)
14 Reducing the burden of monotonous tasks by devising a share and rotation system	26	(68.4)	18	(69.2)	1	(3.8)	7	(26.9)	6	(15.8)	6	(100.0)	0	(0.0)
15 Enhancing measures to prevent mistakes by using labels, color codes, easy-to-understand procedure manuals	17	(44.7)	12	(70.6)	2	(11.8)	3	(17.6)	4	(10.5)	4	(100.0)	0	(0.0)
16 Preventing passive smoking at workplace	15	(39.5)	10	(66.7)	0	(0.0)	5	(33.3)	2	(5.3)	2	(100.0)	0	(0.0)
17 Establishing the system of consultation seeking help from their bosses concerning problems existing in the workplace.	32	(84.2) *	23	(71.9)	3	(9.4)	6	(18.8)	7	(18.4)	6	(85.7)	1	(14.3)
18 Facilitating discussion and consultation among colleagues about problems existing in the workplace.	23	(60.5)	19	(82.6)	0	(0.0)	4	(17.4)	5	(13.2)	5	(100.0)	0	(0.0)
19 Providing opportunities for on-the-job training and education to improve skills and experience of operations	29	(76.3)	19	(65.5)	1	(3.4)	9	(31.0)	8	(21.1) *	8	(100.0)	0	(0.0)
20 Implementing necessary training regarding the evacuation route and emergency procedures for unexpected events	23	(60.5)	11	(47.8)	3	(13.0)	9	(39.1)	5	(13.2)	4	(80.0)	1	(20.0)
21 Making the consultation service well known to all employees	19	(50.0)	10	(52.6)	2	(10.5)	7	(36.8)	4	(10.5)	3	(75.0)	1	(25.0)
22 Providing information about coping skills related to the individual's health and stress reduction	11	(28.9)	6	(54.5)	0	(0.0)	5	(45.5)	2	(5.3)	1	(50.0)	0	(0.0)
23 Making the redesigned project program well known	31	(81.6) *	17	(54.8)	2	(6.5)	12	(38.7)	3	(7.9)	6	(200.0)	0	(0.0)
24 Establishing mental health care system receiving emergency emergency mental health care	16	(42.1)	8	(50.0)	1	(6.3)	7	(43.8)	5	(13.2)	5	(100.0)	0	(0.0)

Top three actions already taken prior to participation in the workshop program and top three actions taken after participation in the workshop program.