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Cross-cultural adaptation of Dimensions of Corporate Safety Scorecard to the Brazilian Portuguese language

Adaptação transcultural para o português do Brasil do *Dimensions of Corporate Safety Scorecard*

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ABSTRACT | Introduction: A broad-scoped approach to the assessment, documentation and application of health inputs at the workplace is needed to perform effective interventions, reduce occupational hazards and promote workers' health and safety. Effective efforts might thus be organized into programs and initiatives to preserve and improve the health and safety of workers. **Objective:** To perform the translation and cross-cultural adaptation of the Dimensions of Corporate Safety Scorecard for use in Brazil to broaden the scope of means to approach and measure the effectiveness of workplace safety actions. **Methods:** The translation and cultural adaptation of the Dimensions of Corporate Safety Scorecard followed recommendations applied in similar studies which establish six steps: foreword translation, reconciliation, back translation, review by internal committee, cultural evaluation of the translation by an external expert panel (pretest) and final review. **Results:** Adoption of the described procedure enabled a detailed analysis of possible options in case of divergences in statements between versions. Thus the quality of the results was ensured and the semantic qualities of the original version were preserved in the translation. **Conclusions:** The Brazilian Portuguese version of Dimensions of Corporate Safety Scorecard, entitled "Questionário sobre Dimensões da Segurança Corporativa," obtained in the present study represents the first step in the use of this instrument for measurement of the effectiveness of health, safety and well-being actions in different work environments.

Keywords | translation; occupational health; working conditions; safety; surveys and questionnaires.

RESUMO | Introdução: Para realizar intervenções efetivas, reduzir os riscos no trabalho e promover a saúde e o bem-estar dos trabalhadores, é necessária uma abordagem ampla que avalie, documente e discuta a aplicação dos ativos de saúde no ambiente laboral, estabelecendo esforços efetivos por meio de programas e iniciativas que sustentem e melhorem a saúde e a segurança dos trabalhadores. **Objetivos:** Traduzir para o português brasileiro e adaptar transculturalmente o instrumento *Dimensions of Corporate Safety Scorecard*, disponibilizando-o para utilização em território nacional e ampliando as possibilidades de abordagem e medição da efetividade de ações de segurança nos ambientes de trabalho. **Métodos:** O processo de tradução e adaptação cultural do *Dimensions of Corporate Safety Scorecard* seguiu recomendações utilizadas em estudos similares, que ocorrem em seis etapas: tradução, reconciliação, retrotradução para o idioma de origem do instrumento, revisão por uma equipe de especialistas internos, avaliação cultural da tradução por um grupo de experts externos (pré-teste) e revisão final. **Resultados:** A adoção dos procedimentos possibilitou uma análise detalhada das alternativas possíveis, em caso de divergências entre as versões existentes, para as formulações do instrumento, assegurando a qualidade dos resultados obtidos e garantindo que a versão em português do instrumento mantivesse as mesmas qualidades existentes na versão original. **Conclusões:** A versão do *Dimensions of Corporate Safety Scorecard* em português do Brasil, agora intitulada "Questionário sobre Dimensões da Segurança Corporativa", obtida no presente estudo, apresenta-se como o primeiro passo para a utilização desta ferramenta na mensuração da efetividade das ações de saúde, segurança e bem-estar nos diversos ambientes de trabalho.

Palavras-chave | tradução; saúde do trabalhador; condições de trabalho; segurança; inquéritos e questionários.

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INTRODUCTION

Good management is increasingly becoming a factor of success for organizations seeking positive outcomes and optimal efficiency in the allocation and utilization of resources. In this regard, integrated information systems and management indices are available for real-time monitoring of the performance of work teams[1-3].

Monitoring indices of operational and financial performance of organizations is still the main priority for managers. However, empirical evidence shows that investment in the health and safety of work teams has potential to significantly contribute to improve the global performance of organizations of many different types by reducing absenteeism, turnover and work accidents and improving the employees' productivity and satisfaction[4,5].

To achieve a more thorough understanding of the relationship between health, safety and productivity, research centers worldwide are looking for means to measure and assess the impact of the work environment on aspects related to workers' health, safety, well-being and productivity demands.

The Harvard T. H. Chan School of Public Health plays a leading role in this regard through broad scoped interventions aiming at reducing occupational hazards, as well as at the promotion of workers' health and well-being. A result of these initiatives was the development of a systematic approach to the assessment, documentation and discussion of health at the workplace in order to design effective programs to preserve and improve the health and safety of workers[4].

This approach, based on the Occupational Safety and Health Administration (OSHA) *Safety and Health Program Assessment Worksheet–Form 33, resulted in the instrument entitled Dimensions of Corporate Safety Scorecard* (DCSS) designed to assess the effectiveness of actions targeting safety, health and well-being at the workplace[6].

DCSS comprises eight sections:

- Leadership and management;
- Hazard anticipation, prevention, detection and control;
- Injury management and disability prevention;
- Safety and health training;
- Employee participation;
- Administration and supervision;
- Planning and evaluation;
- Summary scoring.

The 20 items distributed across the eight sections are scored from 0 to 5, as follows:

- 0: does not apply at all (not implemented);
- 1: applies somewhat (poor implementation);
- 2: applies frequently (fair implementation);
- 3: applies often (good implementation);
- 4: applies almost always (very good implementation);
- 5: fully applies (excellent implementation).

The instrument ends with an item that assesses the organization's overall safety and health system, which score ranges from 0 to 100.

At the global level, DCSS was applied at small and medium-sized enterprises together with other two instruments developed by the *T.H. Chan School of Public Health Center for Work, Health and Well-being for assess*ment of the integration of health and safety at work. Later studies conducted at construction, industry and health organizations broadened the understanding on the applicability of DCSS to different economic activities[7-10].

Different from other instruments for assessment of health and safety at work, DCSS approaches the problems in this field as the result of ongoing policies, programs and working conditions. Consequently, analysis seeks to favor initiatives to integrate the various organizational levels and areas as a way to deal with possible problems in a systemic manner[4].

To enable the application of this approach to Brazilian organizations, the aim of the present study was to perform the cross-cultural adaptation of DCSS[4] and make a generic[11] and up-to-date version available in the Brazilian Portuguese language for integrated assessment of the effectiveness of actions targeting safety, health and well-being in different work environments.

METHODS

The process for cross-cultural adaptation of DCSS to the Brazilian Portuguese language followed recommendations that establish six steps to ensure a reliable

adaptation, to wit: forward translation, reconciliation, back translation, committee review, cultural assessment by an external expert panel (pretest) and final review[12-14] (Figure 1).

Before the onset of the process, the Brazilian National Association of Occupational Medicine (Associação Nacional de Medicina do Trabalho — ANAMT) contacted the institution that developed the original instrument to request authorization for the present study. The *T.H. Chan School of Public Health Center for Work, Health and Well-being* granted the requested written authorization.

Once authorization was granted, two translators independently translated the instrument into the Brazilian Portuguese language. Both are fluent in the original instrument's language, native speakers of the target language, and have knowledge of occupational health psychology and workers' health. The translators were informed as to the study aims and were requested to perform a conceptual, rather than a merely literal translation. The two translators had no contact along this step, the result of which was the Portuguese versions #1 and #2.

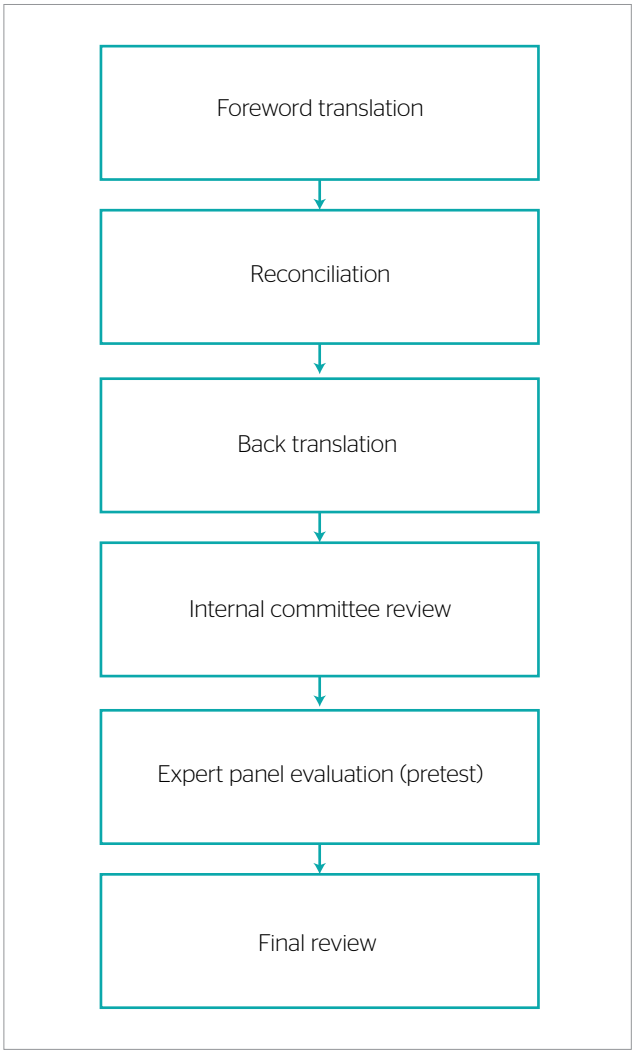

Figure 1. Steps in the process of cross-cultural adaptation of Dimensions of Corporate Safety Scorecard, Brazil, 2017.

These versions were sent to the scientific coordinator of the present study for the purpose of reconciliation, which resulted in a third version.

The reconciled version was sent for independent back translation to two healthcare professionals fluent in the original and target languages — a Scottish nurse and a Brazilian psychologist with a certificate of proficiency in the instrument's original language. Neither had participated in the earlier steps nor was informed as to the study aims. These translators were requested to perform a literal translation of the reconciled version to facilitate the comparison of all the versions.

By this time, there were three Brazilian Portuguese versions and two back translations in addition to the original instrument. A committee — designated as "internal" — of experts from Laboratory of Mental Health and Quality of Work Life (Laboratório de Saúde Mental e Qualidade de Vida no Trabalho — LSMQVT), Dom Bosco Catholic University (Universidade Católica Dom Bosco — UCDB)/National Council of Scientific and Technological Development (Conselho Nacional de Desenvolvimento Científico e Tecnológico — CNPq) was established. Members were five psychology, social work and management professionals with wide experience in occupational health psychology, workers' health and validation of instruments, in addition to the back translators. The task of this committee was to detect flaws or inconsistencies in the first three translated versions. Changes were made in the third Portuguese version to improve statements according to the peculiarities of the target population[12-15].

The result was a fourth Portuguese version, which was subjected to an external expert panel composed of 20 members (e.g., a labor appellate court judge, lawyers, managers, psychologists, an occupational nurse, social workers, human resources managers and medicine, nursing and psychology professors). The task of the external expert

panel was to look for potential problems of comprehension and other aspects which might compromise the assessment of the measured attribute.

The expert panel received a short explanation on the study aims and methods. Then they were instructed to respond the DCSS Brazilian Portuguese version #4 and to mark on the questionnaire form the items they found difficult to understand, with problems in their formulation or which did not meet requirements in the Brazilian legislation.

Based on the external expert panel's suggestions, the LSMQVT committee made the changes rated necessary to improve the cultural adaptation of DCSS to the Brazilian reality. Some items were rewritten and modified to improve their understanding and the responses, as well as their adequacy to the Brazilian legislation, with no impairment of their semantic equivalence.

The group of investigators performed a final grammatical and typographic review to ensure that the final version would be flawless. The result was the Brazilian Portuguese version #5, which was entitled "*Questionário sobre as Dimensões de Segurança Corporativa"* (QDSC). This is a generic, up-to-date, adapted and semantically adequate version for the purpose of application.

RESULTS

DEVELOPMENT OF THE VERSION FOR REVIEW COMMITTEE ASSESSMENT

QDSC final version was obtained by means of a systematic process of translation and cultural adaptation to ensure that statements would maintain their original meaning and be properly understood by the target population[12-14].

Versions #1 and #2 were the two forward translations into Portuguese. Both were constitutively similar, with some variations in the interpretation of some terms which did not change the meaning of statements (e.g., "employee" was translated as "trabalhador" (worker) or "empregado" (employee); "top management" as "alta gestão" (top management) or "alta diretoria" (high board); "management involvement" as "envolvimento gerencial" (management involvement) or "envolvimento da gestão" (involvement of management); "properly prepared" as "adequadamente preparada" (properly prepared) or "devidamente preparada" (duly prepared), among others).

The project coordinator was charged of reconciling versions #1 and #2 to synthesize them into one single version. Since according to her judgment version #1 exhibited more equivalence to the original version, it was selected as the basis for reconciliation. In some cases terms used in version #2 were preferred, for being considered more adequate to the target population.

The reconciled version was subjected to the internal review committee only after the back translations were obtained, as its task was to detect inconsistencies. As a result, changes were made into some statements to maintain their equivalence to the corresponding ones in the original instrument.

For instance, relative to element "management support," statement "*1.2.1 Top management provides competent safety and health staff support to line managers and supervisors"* (Chart 1) *was reconciled as:* "A alta gestão disponibiliza apoio de pessoal competente de saúde e segurança para os gerentes de linha e supervisores." Following assessment by the internal review committee, the statement was formulated as: "A alta gestão disponibiliza apoio de pessoal competente, das áreas de saúde e segurança, para os gerentes operacionais e supervisores."

Still in regard to element "management support," statement "1.2.2 Managers personally follow safety and health rules" (Chart 1) *was reconciled as: "*Os gestores acompanham, pessoalmente, as normas de saúde e segurança." The review committee rewrote this statement as follows: "Os gestores acompanham, pessoalmente, o cumprimento das normas de saúde e segurança."

Similar changes were made into elements "management involvement," "employee involvement," hazard anticipation," "hazard prevention," "hazard detection," "hazard control," "disability prevention and management," "supervisor and management training," "employee training," "employee involvement process," "decision making involvement," "employee participation," "delegation and accountability," "capability," "administration," "planning" and "evaluation," involving 45 out of the 61 statements as formulated in the reconciled version.

The version that resulted from the committee review is described in Chart 1. The equivalence between the translated and the original versions can also be seen in this Chart, as the statements in the original version are placed side by side with the ones translated into the Brazilian Portuguese language.

Chart 1. Original version of *Dimensions of Corporate Safety Scorecard, review committee version and final version after expert panel evaluation*, Brazil, 2017.

		Original version	Internal review committee version (Portuguese version #4)	Expert panel version (Portuguese version #5)
1. Leadership and management	1.1 Safety priority	1.1.1 Top management policy establishes clear priority for safety and health.	Políticas da alta gestão estabelecem clara prioridade para a saúde e segurança.	A alta gestão prioriza políticas para a saúde e segurança no trabalho.
	1.2 Management support	1.2.1 Top management provides competent safety and health staff support to line managers and supervisors.	A alta gestão disponibiliza apoio de pessoal competente, das áreas de saúde e segurança, para os gerentes operacionais e supervisores.	A alta gestão disponibiliza apoio de pessoal capacitado, das áreas de saúde e segurança no trabalho, para os gerentes operacionais e supervisores.
		1.2.2 Managers personally follow safety and health rules.	Os gestores acompanham, pessoalmente, o cumprimento das normas de saúde e segurança.	Os gestores acompanham, pessoalmente, o cumprimento das normas de saúde e segurança.
		1.2.3 Managers delegate the authority necessary for personnel to carry out their assigned safety and health responsibilities effectively.	Os gestores delegam a autoridade necessária para os indivíduos cumprirem com suas responsabilidades de saúde e segurança de forma eficaz.	Os gestores permitem o exercício da autoridade necessária para os responsáveis pela saúde e segurança no trabalho cumprirem com suas atribuições de forma eficaz.
		1.2.4 Managers allocate the resources needed to properly support the organizations safety and health system.	Os gestores alocam os recursos necessários para apoiar adequadamente os sistemas organizacionais de saúde e segurança.	Os gestores direcionam os recursos necessários para apoiar adequadamente os procedimentos de saúde e segurança no trabalho.
		1.2.5 Managers assure that appropriate safety and health training is provided.	Os gestores garantem que seja oferecido treinamento adequado em saúde e segurança.	Os gestores garantem que seja oferecido treinamento adequado em saúde e segurança no trabalho.
		1.2.6 Managers support fair and effective policies that promote safety and health performance.	Os gestores apoiam políticas justas e efetivas que promovem o trabalho saudável e seguro.	Os gestores apoiam políticas justas e efetivas que promovem o trabalho saudável e seguro.
	1.3 Management involvement	1.3.1 Top management is involved in the planning and evaluation of safety and health performance.	A alta gestão está envolvida no planejamento e avaliação do desempenho saudável e seguro no trabalho.	A alta gestão está envolvida no planejamento e avaliação do desempenho saudável e seguro no trabalho.
	1.4 Employee involvement	1.4.1 Top management values employee involvement and participation in safety and health issues.	A alta gestão valoriza o envolvimento e a participação dos trabalhadores nas questões relativas à saúde e segurança.	A alta gestão valoriza o envolvimento e a participação dos trabalhadores nas questões relativas à saúde e segurança no trabalho.

Continue...

Chart 1. Continuation.

		Original version	Internal review committee version (Portuguese version #4)	Expert panel version (Portuguese version #5)
2. Hazard anticipation, prevention, detection and control	2.1 Hazard anticipation	2.1.1 Change analysis is performed whenever a change in facilities, equipment, materials, or processes occurs.	Uma análise de mudança é realizada sempre que ocorrem alterações nas instalações, equipamentos, materiais ou processos.	Uma análise de mudança é realizada sempre que ocorrem alterações nas instalações, equipamentos, materiais ou processos.
		2.1.2 Material Safety Data Sheets are used to reveal potential hazards associated with chemical products in the workplace.	Fichas de Informação sobre Segurança de Produtos Químicos (FISPQs) são usadas para identificar riscos potenciais associados a produtos químicos no local de trabalho.	Fichas de Informação sobre Segurança de Produtos Químicos (FISPQs) são disponibilizadas aos trabalhadores, informando-os sobre os riscos potenciais associados a produtos químicos no local de trabalho.
		2.1.3 The organization is properly prepared for emergency situations.	A organização está devidamente preparada para situações de emergência.	A organização está devidamente preparada para situações de emergência.
		2.1.4 The organization has an effective plan for providing competent emergency medical care to employees and others present at the site.	A organização possui um plano eficaz para oferecer um competente atendimento médico de emergência aos empregados e a outras pessoas presentes no local.	A organização possui um plano eficaz para oferecer um competente atendimento de emergência aos empregados e a outras pessoas presentes no local de trabalho.
	2.2 Hazard prevention	2.2.1 Feasible engineering controls are in place.	Existem controles factíveis da área de engenharia.	Existem controles exequíveis da área de saúde e segurança no trabalho.
		2.2.2 Applicable OSHA-mandated programs are effectively in place.	Os programas determinados pelas Normas Regulamentadoras (NRs) estão efetivamente implementados.	Os programas determinados pelas Normas Regulamentadoras (NRs) estão efetivamente implantados.
		2.2.3 Effective safety and health rules and work practices are in place.	Existem normas efetivas de saúde e segurança e práticas de trabalho.	Existem normas efetivas de saúde e segurança e práticas de trabalho.
	2.3 Hazard detection	2.3.1 A comprehensive, baseline hazard survey has been conducted within the past five (5) years.	Foi realizada uma pesquisa ampla sobre riscos nos últimos cinco (5) anos.	Questão suprimida.
		2.3.2 Effective safety and health self-inspections are performed regularly.	São realizadas regularmente auditorias efetivas em saúde e segurança.	São realizadas regularmente inspeções internas efetivas em saúde e segurança no trabalho.
		2.3.3 An effective hazard reporting system exists.	Existe um sistema efetivo de notificação de risco.	Existe um sistema efetivo de notificação de risco.
		2.3.4 Effective job hazard analysis is performed.	É realizada uma análise efetiva dos riscos no trabalho.	A empresa realiza uma análise efetiva dos riscos no trabalho.
		2.3.5 Expert hazard analysis is performed.	É realizada uma análise especializada de risco.	Questão suprimida.
	2.4 Hazard control	2.4.1 Incidents are investigated for root causes.	Incidentes são investigados para descoberta de suas principais causas.	Incidentes são investigados para descoberta de suas principais causas.
		2.4.2 Accidents are investigated for root causes.	Acidentes são investigados para descoberta de suas principais causas.	Acidentes são investigados para descoberta de suas principais causas.
		2.4.3 An effective procedure for tracking hazard correction is in place.	Um procedimento efetivo de busca de medidas para a correção de riscos está implantado.	Um procedimento efetivo de busca de medidas para a correção de riscos está implantado.
		2.4.4 Effective preventive maintenance is performed.	É realizada uma manutenção preventiva efetiva.	É realizada uma manutenção preventiva efetiva.
		2.4.5 Housekeeping is properly maintained.	A organização e a limpeza interna são mantidas adequadamente.	A organização e a limpeza interna são mantidas adequadamente.
		2.4.6 Personal protective equipment is effectively used.	O equipamento de proteção individual (EPI) é efetivamente usado.	A empresa efetivamente disponibiliza, treina e exige o uso dos equipamentos de proteção individual e coletiva (EPI/EPC).

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Chart 1. Continuation.

		Original version	Internal review committee version (Portuguese version #4)	Expert panel version (Portuguese version #5)
3. Injury management and disability prevention	3.1 Occupational health care	3.1.1 Health care providers who are skilled at diagnosing and treated occupationally related injuries and disease are available to employees.	Profissionais de saúde, especializados em diagnosticar e tratar lesões e doenças relacionadas ao trabalho, estão disponíveis para os trabalhadores.	Profissionais de saúde, especializados em diagnosticar e tratar lesões derivadas de acidentes e doenças relacionadas ao trabalho, estão disponíveis para os trabalhadores.
	3.2 Disability prevention and management	3.2.1 Programs are available to prevent impairment and disability through early detection and prompt treatment of work related injuries and illness.	Programas para prevenir danos e incapacidades, por meio da detecção precoce e tratamento imediato de lesões e doenças relacionadas ao trabalho, são disponibilizados.	São disponibilizados programas para prevenir acidentes e incapacidades relacionados ao trabalho, por meio de sua detecção precoce e tratamento imediato.
		3.2.2 Accommodation of restrictions is actively coordinated with occupational health care providers.	As readaptações são coordenadas ativamente pelos profissionais de saúde ocupacional.	As readaptações são coordenadas ativamente pelos profissionais de saúde ocupacional.
		3.2.3 Light duty/accommodated duty is available when needed.	A readaptação de tarefas é disponibilizada quando necessário.	A readaptação de tarefas é disponibilizada quando necessário.
4. Safety and health training	4.1 Supervisor and management training	4.1.1 Supervisors receive appropriate safety and health training.	Os supervisores recebem treinamento adequado em saúde e segurança.	Os supervisores recebem treinamento adequado em saúde e segurança no trabalho.
		4.1.2 Supervisors receive training that covers the supervisory aspects of their safety and health responsibilities.	Os supervisores recebem treinamento quanto aos aspectos de supervisão de suas responsabilidades em saúde e segurança.	Os supervisores recebem treinamento quanto aos aspectos de supervisão de suas responsabilidades em saúde e segurança no trabalho.
		4.1.3 Safety and health training is provided to managers.	Treinamento em saúde e segurança é oferecido para os gestores.	Treinamento em saúde e segurança no trabalho é oferecido para os gestores.
		4.1.4 Relevant safety and health aspects are integrated into management training.	Aspectos relevantes de saúde e segurança estão integrados ao treinamento em gestão.	Aspectos relevantes de saúde e segurança no trabalho estão integrados ao treinamento em gestão.
	4.2 Employee training	4.2.1 Employees receive appropriate safety and health training.	Os trabalhadores recebem treinamento adequado em saúde e segurança.	Os trabalhadores recebem treinamento adequado em saúde e segurança no trabalho.
		4.2.2 New employee orientation includes applicable safety and health information.	Orientações aos novos trabalhadores incluem informações relativas à saúde e segurança.	Orientações aos novos trabalhadores incluem informações relativas à saúde e segurança no trabalho.

Continue...

Chart 1. Continuation.

		Original version	Internal review committee version (Portuguese version #4)	Expert panel version (Portuguese version #5)
5. Employee participation	5.1 Employee involvement process	5.1.1 There is an effective process to involve employees in safety and health issues.	Existe um envolvimento efetivo dos trabalhadores em questões relativas à saúde e segurança.	Existe um envolvimento efetivo dos trabalhadores em questões relativas à saúde e segurança no trabalho.
	5.2 Decision making involvement	5.2.1 Employees are involved in organizational decision making in regard to safety and health policy.	Os trabalhadores estão envolvidos na tomada de decisões organizacionais relacionadas à política de saúde e segurança.	Os trabalhadores estão envolvidos na tomada de decisões organizacionais relacionadas à política de saúde e segurança no trabalho.
		5.2.2 Employees are involved in organizational decision making in regard to the allocation of safety and health resources.	Os trabalhadores estão envolvidos na tomada de decisões organizacionais relacionadas à alocação de recursos em saúde e segurança.	Os trabalhadores estão envolvidos na tomada de decisões organizacionais relacionadas à alocação de recursos em saúde e segurança no trabalho.
		5.2.3 Employees are involved in organizational decision making in regard to safety and health training.	Os trabalhadores estão envolvidos na tomada de decisões organizacionais relacionadas ao treinamento em saúde e segurança.	Os trabalhadores estão envolvidos na tomada de decisões organizacionais relacionadas ao treinamento em saúde e segurança no trabalho.
	5.3 Employee participation	5.3.1 Employees participate in hazard detection activities.	Os trabalhadores participam das atividades de detecção de risco.	Os trabalhadores participam das atividades de detecção, prevenção e controle de riscos.
		5.3.2 Employees participate in hazard prevention and control activities.	Os trabalhadores participam das atividades de prevenção e controle de riscos.	
		5.3.3 Employees participate in the safety and health training of co-workers.	Os trabalhadores participam do treinamento de seus colegas de trabalho em saúde e segurança.	Os trabalhadores participam do treinamento de seus colegas em saúde e segurança no trabalho.
		5.3.4 Employees participate in safety and health planning activities.	Os trabalhadores participam das atividades de planejamento de saúde e segurança.	Os trabalhadores participam das atividades de planejamento de saúde e segurança no trabalho.
		5.3.5 Employees participate in the evaluation of safety and health performance.	Os trabalhadores participam na avaliação da *performance* em saúde e segurança.	Os trabalhadores participam na avaliação da *performance* dos programas em saúde e segurança no trabalho.

Continue...

Chart 1. Continuation.

		Original version	Internal review committee version (Portuguese version #4)	Expert panel version (Portuguese version #5)
6. Administration and supervision	6.1 Delegation and accountability	6.1.1 Safety and health program tasks are each specifically assigned to a person or position for performance or coordination.	As tarefas do programa de saúde e segurança são atribuídas especificamente a uma pessoa ou função, para seu cumprimento ou coordenação.	As tarefas do programa de saúde e segurança no trabalho são atribuídas especificamente a uma pessoa ou função, para seu cumprimento ou coordenação.
		6.1.2 Each assignment of safety and health responsibility is clearly communicated.	Cada atribuição de responsabilidade em saúde e segurança é claramente comunicada.	Cada atribuição de responsabilidade em saúde e segurança no trabalho é claramente comunicada.
		6.1.3 An accountability mechanism is included with each assignment of safety and health responsibility.	Um mecanismo de responsabilização é incluído em cada atribuição relativa à saúde e segurança.	Um mecanismo de responsabilização é incluído em cada atribuição relativa à saúde e segurança no trabalho.
	6.2 Capability	6.2.1 Individuals with assigned safety and health responsibilities have the necessary knowledge, skills, and timely information to perform their duties.	Os indivíduos responsáveis pela saúde e segurança possuem conhecimentos, habilidades e informações necessárias para desempenhar suas funções.	Os indivíduos responsáveis pela saúde e segurança no trabalho possuem conhecimentos, habilidades e informações necessárias para desempenhar suas funções.
		6.2.2 Individuals with assigned safety and health responsibilities have the authority to perform their duties.	Os indivíduos responsáveis pela saúde e segurança possuem autoridade para desempenhar suas funções.	Os indivíduos responsáveis pela saúde e segurança no trabalho possuem autoridade para desempenhar suas funções.
		6.2.3 Individuals with assigned safety and health responsibilities have the resources to perform their duties.	Os indivíduos responsáveis pela saúde e segurança possuem os recursos para desempenhar suas funções.	Os indivíduos responsáveis pela saúde e segurança no trabalho possuem os recursos para desempenhar suas funções.
	6.3 Administration	6.3.1 Organizational policies promote the performance of safety and health responsibilities.	As políticas organizacionais promovem o cumprimento das responsabilidades em saúde e segurança.	As políticas organizacionais promovem o cumprimento das responsabilidades em saúde e segurança no trabalho.
		6.3.2 Organizational policies result in correction of non-performance of safety and health responsibilities.	As políticas organizacionais resultam na correção das inconsistências no cumprimento das responsabilidades em saúde e segurança.	As políticas organizacionais resultam na correção das inconsistências no cumprimento das responsabilidades em saúde e segurança no trabalho.

Continue...

Chart 1. Continuation.

		Original version	Internal review committee version (Portuguese version #4)	Expert panel version (Portuguese version #5)
7. Planning and evaluation	7.1 Planning	7.1.1 Safety and health goals and supporting objectives exist.	Existem objetivos relacionados à saúde e segurança e metas que sustentem os mesmos.	Existem objetivos relacionados à saúde e segurança no trabalho e metas que sustentem os mesmos.
		7.1.2 An action plan designed to accomplish organizational safety and health objectives is in place.	Um plano de ação projetado para atingir os objetivos de saúde e segurança organizacional está em vigência.	Um plano de ação projetado para atingir os objetivos de saúde e segurança organizacional está em vigência.
	7.2 Evaluation	7.2.1 Workplace injury and illness data are effectively analyzed.	Os dados sobre doenças e acidentes de trabalho são efetivamente analisados.	Os dados sobre doenças e acidentes de trabalho são efetivamente analisados.
		7.2.2 Hazard incidence data are effectively analyzed.	Os dados de incidência de riscos são efetivamente analisados.	Os dados de ocorrência de riscos são efetivamente analisados.
		7.2.3 Review of OSHA mandated programs is conducted annually.	A revisão dos programas determinados pelas Normas Regulamentadoras (NRs) é realizada anualmente.	A revisão dos programas determinados pelas Normas Regulamentadoras (NRs) é realizada anualmente.
		7.2.4 Review of overall safety and health management systems is conducted at least annually.	A revisão dos sistemas gerais de gerenciamento de saúde e segurança é realizada ao menos anualmente.	A revisão dos sistemas gerais de gerenciamento de saúde e segurança no trabalho é realizada ao menos anualmente.
8. Overall synthesis		8.1 Reflecting upon your total knowledge of the organization, use your professional judgment to assign an overall score (between 0 and 100) for the organization's safety and health system.	Refletindo sobre seu conhecimento sobre a organização, use seu julgamento profissional para atribuir uma pontuação geral (entre 0 e 100) para o sistema de saúde e segurança da mesma.	Refletindo sobre seu conhecimento com relação à organização, use seu julgamento profissional para atribuir uma pontuação geral (entre 0 e 100) para o sistema de saúde e segurança no trabalho.

APPLICATION TO EXPERT PANEL

Once the Brazilian QDSC version was obtained, its adequacy for use with the target population was assessed through application to an expert panel.

Panel members were: human resources assistants (15%), organizational and occupational health psychologists (15%), medicine, nursing and psychology professors (15%), social workers (10%), a company director (5%), a human development coordinator (5%), a human resources analyst (5%), a personal department assistant (5%), a management supervisor (5%), a lawyer (5%), an occupational nurse (5%), a physical therapist (5%) and a labor appellate court judge (5%).

Most expert panel members were female (65%), self-reported whites (90%) and had completed graduate education (80%). Most reported to have full-time jobs (90%) at large (70%) for profit (45%) organizations.

The expert panel members worked for organizations in the following areas: education (50%), administration and complementary services (15%), public administration defense and social security (10%), professional, scientific and technological activities (5%) and other services (5%).

When inquired as to occupational health and workers' well-being benefits, the panel members responded that employers provided health insurance (80%), health education (80%), contacts for employee services (35%), physical environment and social support for health improvement (40%), inclusion of health promotion actions into the organizational culture (25%) and periodical examinations with adequate follow-up and treatment (70%).

The panel members required about 35 minutes to respond and analyze QDSC. When this step was over, the study coordinator analyzed the instrument item by item with the panel members and inquired them as to their comprehension of statements and suggestions of changes.

The panel members suggested changes to improve the comprehension of statements and adjust them to the Brazilian legislation. The accepted changes can be seen in Chart 1. This chart also allows following up the progression of the process of translation and cross-cultural adaptation of DCSS, as the original version, the one applied to the expert panel and the final one — resulting from the expert panel's contributions to improve the instrument comprehension by the target population and adjust it to laws and norms in force in Brazil — are placed side by side.

To facilitate the calculation of scores for elements with more than one statement, the experts suggested introducing divisions among statements and record the average score for the full element. This procedure did not alter the minimum and maximum score scales and solved the difficulty posed by having to score several statements together. Thus the scoring procedure became clearer and reduced the risk of bias.

Statement *"2.3.1 A comprehensive, baseline hazard survey has been conducted within the past five (5) years,"* (Chart 1) *translated as "*Foi realizada uma pesquisa ampla sobre riscos nos últimos cinco (5) anos," was eliminated from the final version. The reason was that both experts and the study coordinator observed that in addition to mandatory according to the Brazilian law, such survey is included in the Environmental Hazard Prevention Program (Programa de Prevenção de Riscos Ambientais — PPRA) routinely carried out every year by Brazilian companies, which made this statement unnecessary.

Also statement "*2.3.5 Expert hazard analysis is performed,"* (Chart 1) translated as "É realizada uma análise especializada de risco," was eliminated. The reason was that hazard assessment within PPRA must mandatorily be performed by experts (e.g., occupational physicians, work safety engineers, work safety technicians, occupational nurses, occupational nursing technicians or assistants) affiliated or not with the Safety Engineering and Occupational Medicine Specialized Service (Serviço Especializado em Engenharia de Segurança e Medicina do Trabalho — SESMT).

Statements "*5.3.1 Employees participate in hazard detection activities"* and "*5.3.2 Employees participate in hazard prevention and control activities"* (Chart 1) were reunited into one single statement, "Os trabalhadores participam das atividades de detecção, prevenção e controle de riscos" (Employees participate in hazard detection, prevention and control activities). This change was suggested by the expert panel on the grounds that hazard detection, prevention and control activities are parts of one single and interrelated process. For this reason, they judged more appropriate to place them together in one single statement, since the suggested change did not have any effect on the instrument score.

Statement *"1.1.1 Top management policy establishes clear priority for safety and health,"* (Chart 1) initially translated as "Políticas da alta gestão estabelecem clara prioridade para a saúde e segurança" was changed to "A alta gestão prioriza políticas para a saúde e segurança no trabalho" in the final version. The reason was to make clear the intention to evaluate whether top management truly prioritizes the employees' health and safety through policies.

Term "competent" in statement *"1.2.1 Top management provides competent safety and health staff support to line managers and supervisors,"* (Chart 1) initially translated as "competente" was changed to "capacitado." This change did not compromise the semantic equivalence between the

original version and the one translated into the Brazilian Portuguese language.

A similar decision was made in the case of expression "allocate the resources" in statement *"1.2.4 Managers allocate the resources needed to properly support the organizations safety and health system"* (Chart 1). *Initially translated as "alocam os recursos," it was changed to "direcionam os recursos."*

Statement "*2.1.2 Material Safety Data Sheets are used to reveal potential hazards associated with chemical products in the workplace"* (Chart 1) *was initially translated as* "Fichas de Informação sobre Segurança de Produtos Químicos (FISPQs) são usadas para identificar riscos potenciais associados a produtos químicos no local de trabalho," but then changed to "Fichas de Informação sobre Segurança de Produtos Químicos (FISPQs) são disponibilizadas aos trabalhadores, informando-os sobre os riscos potenciais associados a produtos químicos no local de trabalho." The change was intended to adjust the statement to the Brazilian legislation, which demands from manufacturers to provide the corresponding FISPQ (Chemicals Safety Information Form) together with products and to orient users to ensure access to this information at the locations when such products are effectively used.

A similar approach was suggested for OSHA standards/programs updated in Brazilian Regulatory Standards (RS), which are the subject of statements "*2.2.2 Applicable OSHA-mandated programs are effectively in place"* and *"7.2.3 Review of OSHA mandated programs is conducted annually"* (Chart 1). Despite differences in legislation and labor obligations between Brazil and the United States, RS are the Brazilian correspondence to OSHA standards.

Still in regard to safety at the workplace, to expression "*personal protective equipment" in statement "2.4.6 Personal protective equipment is effectively used,"* (Chart 1) *translated as "*equipamento de proteção individual (EPI)", expression "equipamento de proteção coletiva (EPC)" (collective protective equipment — CPE) was added. The reason is that according to the expert panel, also CPE is highly relevant to ensure effective control of occupational hazards.

Other and minor changes to standardize and adjust terms to the target population were also suggested by the expert panel and included in the questionnaire, as Chart 1 shows.

A procedure similar to the ones described in the Methods and Results sections was used for the translation and cultural adaptation of the instructions on how to respond the instrument. Once the process was over, the questionnaire in its generic, up-to-date, adapted and semantically adequate version for use in Brazil was named QDSC.

DISCUSSION

Structured instruments for assessment of occupational health and safety from multiple disciplinary perspectives are highly relevant for the development of science and improving practices at organizations to enhance the quality of life and well-being of workers[15-17].

The present study represents a significant contribution in this regard through the translation of DCSS — developed by the *T.H. Chan School of Public Health Center for Work, Health and Well-being* — into the Brazilian Portuguese language. The aim of this initiative was to make an internationally tested instrument attuned to the latest innovations in occupational health and safety available to professionals.

The sequence of steps performed in the present study followed the main orientations and consensuses for translation and cultural adaptation of instruments (foreword translation, reconciliation, back translation, committee review, cultural evaluation by expert panel and final review). Thus the quality of the results was ensured, and the semantic qualities of the original version were preserved in the Portuguese translation[13-18].

The procedures selected for translation, reconciliation and back translation, in addition to the independent work of the translators, enabled a detailed analysis of possible options for instances of divergence between the translated statements.

In turn, the work performed by the internal and external expert committees — composed of professionals with wide experience in occupational health — allowed for better alignment of the translated statements to the universe of professionals likely to apply the questionnaire. Similarly, the questionnaire was adjusted to the Brazilian laws and regulations.

Changing the format of instruments and exclusion of items are complex tasks. In the present study, they were accomplished in a way that did not impair the equivalence between the original and the Portuguese version[19]. To be accepted, suggested changes had to be approved twice, i.e., by both the external and internal expert committees[20]. In the case of statements #2.3.1 and #2.3.5, exclusion was initially suggested by the external expert panel, and was then approved by the internal review committee once its legally mandatory status was confirmed (RS 9) [21].

We should observe that the changes made did not modify the instrument's total score. The translated version preserves the format of the original, respondents are required to evaluate all statements belonging to a given essential element, but to attribute a score — from 0 to 5 — to the element rather than to each individual statement[11].

While these changes did not modify the instrument's score, a suggestion made by the expert panel to improve the evaluation of essential elements in the Portuguese version — division between statements and entering their average score as the final score on the element in question — allows for values with decimal points, thus differing from the original instrument. These changes demand additional studies to quantitatively assess the functional and measurement equivalence of the translated version to the original instrument[12-22].

Also the recruitment method (convenience sampling) and sample representativeness should be considered as limitations of the present study. This even though the qualitative and quantitative composition of the sample followed recommendations in the literature for selection of expert panels for evaluation of instruments[20].

CONCLUSION

The version of DCSS adapted to the Brazilian Portuguese language obtained in the present study represents the first step in the use of this instrument for measurement of the effectiveness of health, safety and well-being actions in different work environments.

On these grounds, quantitative studies can be developed to evaluate the validity and psychometric characteristics of the Portuguese Brazilian version aiming at broad application of the instrument and creation of benchmark repositories for its application at organizations of any type interested in affording increasingly safer and healthier work environments.

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