

# A systematic activity for safety education and awareness at a rental company of temporary equipment to workers at construction sites

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## ABSTRACT

A company that rents aluminum alloy portable work platforms and other equipment is promoting a safety education and information campaign for construction workers. The company's awareness-raising staff, called "Team SG Cosmos," consists of trained actors who go to construction sites to explain the safe use and precautions of aluminum alloy portable work platforms in a short drama style. Awareness-raising and promotion activities" conducted by SG Cosmos members at construction sites are aimed at sharing "(3) information in use (residual risk information)". This is step (3) of the 3-step method ((1) Intrinsic safety design measures, (2) Safety protection, and (3) Information in use), which is a risk reduction measure implemented by manufacturers. The name "safety awareness promotion activities" of SG Cosmos means that SG Cosmos is not simply an "information campaign" that provides residual risk information. Rather, it is an activity that focuses on voluntary participation by workers SG Cosmos is not simply an "awareness campaign" that provides residual risk information. In general safety education, participants are often asked to confirm their understanding of the course content through tests or questionnaires after taking the lecture course. What is important, however, is that the objective of the course is achieved when the trainees understand the content, attempt to take the prescribed safety actions, and actually perform them. Therefore, the Safety and ANSHIN Technical Research Center (SATEC) of a work platform rental company, conducted the following two surveys on wellbeing to determine whether workers who participated in safety awareness promotion activities conducted by SG Cosmos understood the content and were willing to take appropriate actions. Well-being refers to a continuous state of being well, and in a broad sense to continued happiness, health, and well-being. In particular, subjective well-being (SWB) refers to a safe and comfortable state of human well-being, and is an indicator that evaluates job satisfaction and a sense of safety and security, and consists of five questionnaire items. On the other hand, psychological well-being (PWB) is an index that evaluates the state of relationships with others, independence, self-acceptance, and so on. The experiment was conducted with two members of SG Cosmos and six construction site workers. As a result of evaluating subjective well-being before and after the safety awareness activities, both the on-site workers and SG Cosmos members showed an improvement in subjective well-being after the activities than before the activities. It was also revealed that they felt safer and more secure after the activities. The results of the evaluation of psychological well-being before and after the safety awareness activity indicated a high level of satisfaction with the efficient use of opportunities to participate in the activity (i.e., taking a lunch break before participating in the activity). In addition, SG Cosmos members were found to be more satisfied with having accomplished the project after the activity. Based on these results, we believe that this is an ideal way to implement a course that results in a win-win relationship between the course provider and the participants.

## 1. INTRODUCTION

In general safety training courses, participants are often asked to confirm their understanding of the course content with a test or questionnaire after the course. What is important, however, is that participants understand the content, are willing to take the prescribed safety actions, and actually do so, thereby achieving the objectives of the course. At a company that rents portable work platforms and other equipment, an awareness promotion staff named "Team SG Cosmos" conducts "safety awareness activities" as a safety education and awareness program for construction site workers (Fig. 1). SG stands for Safety Good. The "Team SG Cosmos" trained performers go to construction sites and explain the safe use of portable work platforms and precautions in the style of a short drama. The short drama also expresses the importance of pointing and calling out to other workers, and workers sometimes jump in to participate.

The "safety awareness activities" conducted by SG Cosmos members in the field are based on the third of the three-step method ((1) essential safety design measures, (2) safety protection measures, and (3) information on use), which is a risk reduction method used by manufacturers. The purpose of the third of these steps is to share "information on use (residual risk information)." The name "Safety Awareness Promotion Activities" by SG Cosmos means that SG Cosmos is not simply an "awareness campaign" to provide residual risk information, but

rather an activity that focuses on the voluntary participation of workers. It means that SG Cosmos is not simply an "awareness campaign" to provide information on residual hazards.

Therefore, the Safety and ANSHIN Technical Research Center (SATEC), a work platform rental company, conducted a survey on whether workers who attended the safety awareness promotion activities conducted by SG Cosmos understood the content and were willing to take appropriate actions, using the following two types of questionnaires on well-being. Well-being refers to a continuous state of being well, and in a broad sense to the continuation of happiness, health, and well-being. In particular, subjective well-being (SWB) refers to a state of human safety and comfort, and is an indicator that evaluates job satisfaction and a sense of safety and security, and consists of five questions. On the other hand, psychological well-being (PWB) is an indicator that evaluates the state of relationships with others, independence, and self-acceptance.



Fig. 1 Safety awareness activities by "Team SG Cosmos"

## 2. MATERIALS and METHODS

**General information:** The experiment was conducted inside a building construction site during a lunch break in June 2022. There were two members of SG Cosmos, both of whom were veterans with ample experience in safety awareness activities. Six construction workers were members of the construction site crew, who were present at work on the day of the experiment.

**Procedure:** Prior to the safety awareness promotion activities, both SG Cosmos members and field workers completed a subjective well-being and psychological well-being questionnaire. Subjective well-being consisted of 5 questions (Diener, 1984), and psychological well-being consisted of 3 questions, including one reversal item for each of the 6 subcategories, for a total of 18 questions (Ryff, 1989). The 6 subcategories were Autonomy (A sense of independence and (A sense of independence and freedom from social pressure), Environmental Mastery (Feeling capable and having opportunities to manage an individual's environment), Personal Growth (Learning, having new experiences, and taking on challenges that lead to growth), Purpose in Life (Having goals and a sense that life has meaning and purpose), Positive Relations with others (Having meaningful connections with others marked by reciprocal affection, empathy, intimacy, and trust), and Self-acceptance (Having a positive attitude about the self). Both subjective and psychological well-being were answered by selecting the number that applied from 1 - 7. The following items were selected from 1 - 7: 1. do not agree at all, 2. mostly disagree, 3. disagree, 4. neither agree nor disagree, 5. agree, 6. mostly agree, 7. very much agree.

After answering the subjective well-being and psychological well-being questionnaires, SG Cosmos conducted the day's safety awareness activity, how to properly assemble and fold a workbench, with occasional questions to the workers and having the workers actually do it themselves. After the safety awareness promotion activity, the workers once again answered the subjective well-being and psychological well-being questionnaires.

## 3. RESULTS

The results of the subjective well-being ratings of six field workers and two SG Cosmos before and after the safety awareness activities are shown in Fig. 2. The field workers had a mean pre-activity score of 3.24 and a mean post-activity score of 3.32; the SG Cosmos members had a mean pre-activity score of 3.34 and a mean post-activity score of 3.75. Both field workers and SG Cosmos members showed better scores for subjective well-being after the activity than for subjective well-being before the activity.

The results of the evaluation of psychological well-being before and after the safety awareness activities are shown in Fig. 3. The average pre-activity score of autonomy in psychological well-being of the field workers was 3.73 and the average post-activity score was 4.13. The average pre-activity score of environmental mastery was 4.27 and the post-activity score was 4.07. The average pre-activity score of personal growth was 4.13 and the post-activity score was 4.33. The average pre-activity score of purpose in life was 3.33 and the post-activity score was

3.47. The average pre-activity score of positive relations with others was 3.80 and the post-activity score was 3.87. Self-acceptance had an average of 3.60 for both pre and post-activity.

For SG Cosmos' psychological well-being, average pre-activity score of autonomy in psychological well-being was 3.81 and the average post-activity score was 4.09. The average pre-activity score of environmental mastery was 4.04 and the post-activity score was 4.47. The average pre-activity score of personal growth was 3.83 and the post-activity score 3.83. The average pre-activity score of purpose in life was 3.95 and the post-activity score was 4.19. The average pre-activity score of positive relations with others was 3.48 and the post-activity score was 2.83. The average pre-activity score of self-acceptance was 3.92 and the post-activity score was 4.05.

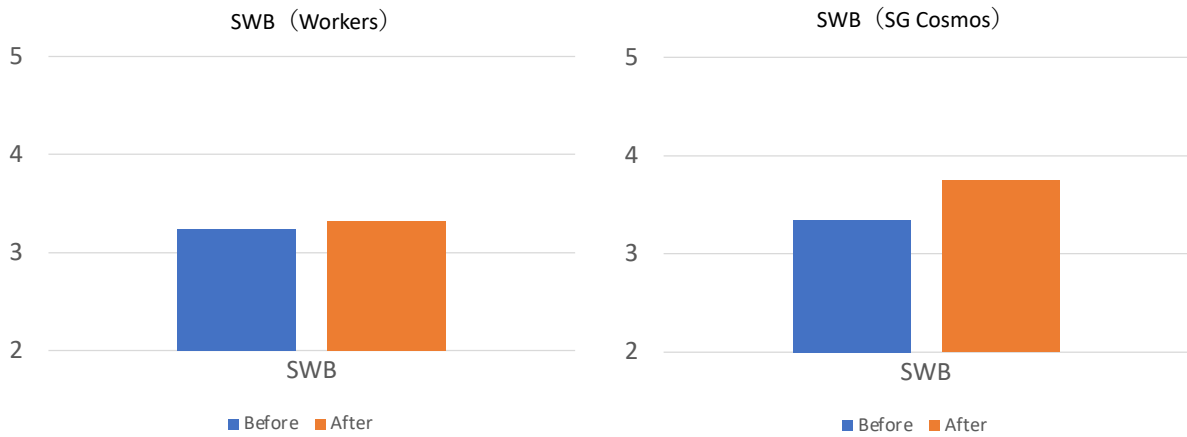


Fig. 2 Average scores of SWB (Workers and SG Cosmos)

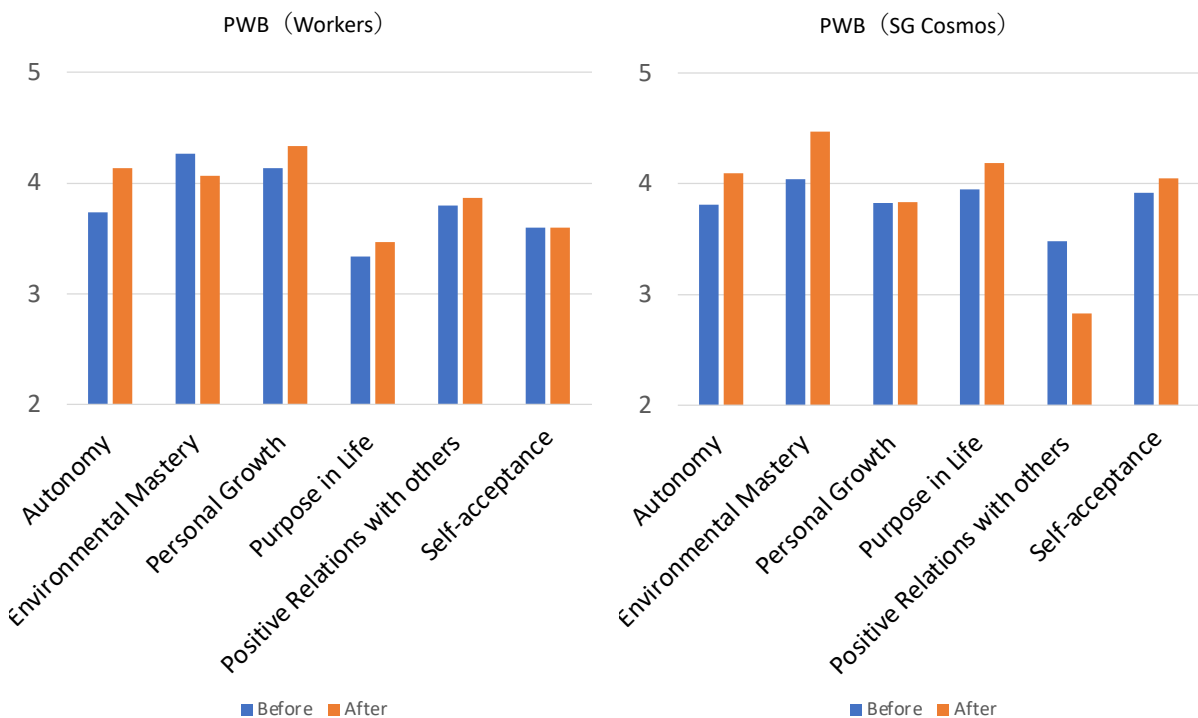


Fig. 3 Average scores of PWB (Workers and SG Cosmos)

#### 4. DISCUSSION

The results of the subjective well-being evaluation before and after the safety awareness promotion activities showed that both on-site workers and SG Cosmos members had a better sense of subjective well-being after the

activities than before the activities. In other words, it was clear that they felt safer and more secure after the activities.

Next, the results of the evaluation of psychological well-being before and after the safety awareness promotion activity indicate that among the six subcategories, the average post-activity score was higher than the pre-activity score for the field workers' autonomy, personal growth, purpose in life, and positive relationships with others, indicating that the field workers' satisfaction with the efficient use of opportunities to participate in activities (obtaining lunch break before participating in activities) was high. This indicates a high level of satisfaction among workers. In addition, the lower average post-event score than the average pre-safety awareness activity score for environmental control skills may be due to the fact that learning to properly assemble and use the workbench during safety awareness activities has necessitated a change in the way they had previously assembled and used the workbench in their own way.

Regarding the results of SG Cosmos' psychological well-being, the mean post-event scores for autonomy, environmental control, personal growth, life purpose, and self-acceptance were higher than the pre-safety awareness activities, indicating a greater satisfaction with having completed the project after the activities were completed. The lower average score for positive other-relationships after the safety awareness activity may be related to the fact that, from SG Cosmos' perspective in the present context, it was taught to other people, the site workers.

In this way, we believe that a win-win relationship between the course provider and the participants is essentially the ideal way to conduct a training course.

## **5. REFERENCES**

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