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Original Article

How Effectively Safety Incentives Work? A Randomized Experimental Investigation

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ABSTRACT

Background: Incentive and penalty (I/P) programs are commonly used to increase employees' safety outcomes, but its influence on employees' safety outcomes is under-investigated. Moreover, under developed economies lack safety culture and there is dearth of literature focusing on empirical studies over there [1]. Based on these gaps, this study attempts to see the impact of I/P programs on safety outcomes in a developing country.

Methods: The study was carried out in three stages, where Stage I revealed that selected 45 organizations were deficit of safety culture and practices, while only three firms were found good at safety practices. At Stage II, these three firms were divided in two clusters (groups), and were probed further at Stage III. At this stage group, one was manipulated by providing incentives (experimental group) and employees' responses in terms of safety motivation and performance were noticed.

Results: It was observed that the experimental group's safety motivation and performance had improved (both for immediate and 1-month later performance). The results were further probed at Phase 3 (after 3 months), where it was found that the benefits of I/P programs were not long lasting and started replenishing.

Conclusion: Findings of the study helped researchers conclude that safety incentives have only short-term influence on safety outcomes, while a long-term and permanent solution should be found.

1. Introduction

Safety behavior research in the area of safety management system has become dominant specifically in developing countries [2]. To improve the safety behavior of workers, organizations focused various safety practices. Previously researchers mainly focused on safety management system deprived of differentiating the safety intervention practices that may affect differently on safety outcomes of workers. Workplace safety is considered very important for an organization. The increased importance of safety at workplace has shifted firm practices to a more conscious organization. In spite of increased consideration to workplace safety, the reporting injuries and accidents are still mounting [1,3].

To overcome such issues, firms develop working environment where workers' safety conscious behavior is fostered, managed, and rewarded [4]. Implementation of profuse safety practices is significant on workplace to ensure the employees' safety and to develop the positive work behavior for attaining the safety performance. Implementation of all safety practices under one roof is called safety management system of organization [5]. Shakioye and Haight [6] stated that the two types of safety management system followed by the organizations, first one is called management level, which discusses the policies related to the safety interventions and safety administrative activities. Second one at technical level, which refers to the practices that ensure the safe working environment and safety planning.

Literature studies prove that technical-level safety management requires the involvement of both organization and employees [7–11], while the role of employees is believed to be of paramount importance [12–14]. Neal and Griffin [15] further commented that it is not merely the organization led activity, rather employees' motivation is as important as the organizational commitment toward safety culture. Thus, it is not only employees' performance

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that needs to be investigated, but also their motivation for safety is important [16].

To attain the highest level of employees' performance and motivation, organizations have to bring some interventions. Safety intervention is defined as a step to implement or alter methods for the safety improvement [17]. Such interventions include both soft and hard interventions, which may cover training, development of safety culture, welfare benefits, safety performance evaluation, workers' participation, and so on [18–20]. One of such interventions, that has gained popularity, is the provision of incentives/penalty (henceforth, I/P) for safety performance and behavior [21]. Incentives are typically a promise made with employees by the organization before the work operation starts, with an aim to motivate them to think smarter, work efficiently, meet performance standards, and within the given time frame. Incentives are defined by Wilde [22] as "future rewards [that are] contingent upon fulfilling a future condition." While penalty is alternatively called punishment, which may include jail time, dismissal from job, fine, criticism, and others; just to decrease the level of undesirable behavior at workplace and increase the safety performance [23]. Although multiple approaches of jobsite safety proposed in several researches for safety enhancement identification, the key element of successful safety performance and effective safety management depends on the human resource of organization [24]. The core purpose of I/P schemes is to ensure that level of safety compliance, at work, is at its highest level [25].

I/P programs, so far, are focused on ensuring safety at construction projects by contractors and rewarding and penalizing them for (un)safe conditions and acts [21]. Such programs are also used to ensure that contractors follow the parent company desired safety standards [26,27]. Past studies are evident of the fact that safety incentives improve working, reduce accidents, and increase safety performance at construction sites [25,28]. While further highlighting predictors of safety at work, Hasan and Jha [29] reported that, in India, safety environment is influenced by six factors, and safety incentives is the most dominating of all. Moreover, it is also observed that safety incentives given on regular basis provide more benefits than occasional rewards [25,26]. Kadefors [30] also found that I/P programs for contractors improve client–contractor trust and contractor's safety behavior. I/P are often found to be evaluated for benefits and drawbacks, while behavioral outcomes are rarely investigated [31].

But how such incentives influence safety performance of individual employees is largely under-investigated area [21,31,32]. A profound look at literature studies shows that there is dearth of literature focusing on employees' perspective of incentive programs and its effects on their safety behavior and performance [33]. Moreover, past studies have provided evidence from industrialized countries, e.g., China, UK, USA [34], or rapidly developing countries, e.g., India [29], but safety literature from developing economics is scarce and limited [1]. Furthermore, the results offered by past studies on effectiveness of I/P programs are also mixed and contradictory [21,29].

Against the backdrops highlighted above, the aim of this study is to determine I/P programs and its effectiveness in improving employees' safety motivation and performance. Moreover, this study also adds value in literature by providing an evidence from a developing country (i.e., Pakistan), as dearth of literature related to developing countries is reported [21].

This study could be built on the basis of social exchange theory of Blau [35], which assumes that care and well-being offered from one party in-debts recipient to reciprocate with favors of equal or higher values. Here, it is assumed that safety I/P programs (as a favor/penance from organization) may make employees work well or refrain them from doing something undesirable. Thus, safety I/P programs will improve positive and reduce negative/undesirable outcomes.

Thus, this study aims to achieve following objectives:

1. To study the organizational culture for safety
2. To see the short-term (immediate) impact of I/P program on safety performance and motivation
3. To see the medium-term (after 3 months of intervention) impact of I/P program on safety performance and motivation
4. To draw a conclusive thought for effectiveness of I/P programs.

2. Materials and methods

This study was based on an experimental design, where data were collected from employees of manufacturing small- and medium-sized enterprises (SMEs), between February and December 2017. SMEs are considered important for an economy and contribute a larger share in an economy than large-sized firms [36]. The study was conducted in three stages, where details of each stage are given as follows:

2.1. Stage I—safety culture and practices (February–March 2017)

At this stage, the main purpose of investigation was to explore the level of safety culture, practices, safety performance, and motivation of employees and supervisors. About 45 SMEs employing 12–65 (average, 23) workers were approached for data collection. Self-administrated questionnaire and structured interviews were used to elicit responses of manufacturing employees and their supervisors. All in all, there were 1,035 employees and 69 supervisors working in these firms. About 350 employees and 52 supervisors from all these firms were available as sampling units, thus were approached for data collection.

The respondents were inquired for safety culture and practices at work, which was inquired with the help of 15 items instrument of Cheng et al [37]. The questions were probed on dichotomous scale (yes or no). The said scale was checked for contents' validity considering the environment in Pakistan. For this purpose, the instrument was evaluated by six industry experts having involvement in safety practices at work. After a detailed discussion, 14 items were finalized by these experts that were found suitable in the organizational context of Pakistan. The new version of 14 items scale was used for data collection from the selected organizations. Safety performance and motivation scales were adopted from the work of Griffin and Neal [16], covering six items for safety motivation and two items used to operationalize safety performance. Both these scales were found to be suitable with high reliability values ($\infty = 0.81$ and 0.80, respectively).

Of selected sample, only 207 employees and 24 supervisors (from 23 firms) responded back, while they were working there for 3–11 years (average experience 3.5 years for employees and 7.25 for supervisors). Most were men (98.75%) and had low level of education (average 8.5 years of schooling for employees and 10.25 years for supervisors). All the firms were assessed for difference in their safety culture and practices, while both employees and supervisors were evaluated for similarities/differences in their safety motivation and performance. Results of this stage become basis for following stages.

2.2. Stage II—group (cluster) formulation (April–May 2017)

Results of previous stage were used to find out the similarities and differences among firms; and to make selection of groups for this and following stages. Of the 23 respondent firms, only three

Table 1
Results for Stage I, safety culture and practices at SMEs

Safety culture & practices	Employees				Supervisors			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Written safety policy	26	12.56	181	87.44	3	12.50	21	87.50
Safety manual	75	36.23	132	63.77	16	66.67	8	33.33
Regular safety meeting	63	30.43	144	69.57	10	41.67	14	58.33
Safety promotion	69	33.33	138	66.67	7	29.17	17	70.83
Safe work practices	62	29.95	145	70.05	9	37.50	15	62.50
Safety inspection	105	50.72	102	49.28	12	50.00	12	50.00
Safety training schemes	34	16.43	173	83.57	4	16.67	20	83.33
Safety records	89	43.00	118	57.00	9	37.50	15	62.50
Safety audit	54	26.09	153	73.91	8	33.33	16	66.67
Formal safety organizational structure	34	16.43	173	83.57	6	25.00	18	75.00
Accident investigation and report	17	8.21	190	91.79	14	58.33	10	41.67
Accidental statistical analysis	19	9.18	188	90.82	7	29.17	17	70.83
Safety commitment at company level	11	5.31	196	94.69	6	25.00	18	75.00
Safety commitment at employee level	28	13.53	179	86.47	7	29.17	17	70.83

SME, small- and medium-sized enterprises.

organizations were identified, where majority of the safety practices criteria were met: e.g., safety policy was written, manuals were provided and shared, safety meetings were called on regular basis, safety practices were intact, and records were well maintained along with their audit. These firms were also valued because both the employees and supervisors of these firms reported that the high level of commitment is being showed by management and employees toward safety practices at work. These firms were different in size, with respect to number of employees (covering 19, 28, and 42 employees each). These three firms were inquired in this stage with an aim to make clusters (or similar groups) for experimental investigation. Groups formulation was necessary select suitable study design, i.e., simple randomized experimental controlled group investigation. Kirk [38] valued such study design and commented that experimental controlled group investigation offers valid results because of the presence of one controlled group in the experimental study. Considering the study requirements, employees of these three firms were divided in two clusters using age, qualification, experience, working hours, safety performance, and safety motivation as criteria. Kirk [38] further commented that both the controlled and experimental groups should be similar. Thus, an attempt was made at this stage to form clusters/groups with similar characteristics. For the purpose of experimental inquiry, all these employees of the selected firms were divided in two clusters (consisting of 45 and 44 employees, respectively). The data collected at this stage were analyzed using frequencies and multiple regression (see analysis for this stage). A recommended technique to verify the trustworthiness of regression results is the use of residual plots with robustness of observations (i.e., 14 safety practices linking with safety performance and motivation for two clusters). The residual plots are shown in Appendix I, where it is evident that the data were normally distributed and met the multiple regression results, which show meaningful results (as the assumption is met).

2.3. Stage III—randomized experimentation (June–December 2017)

The groups generated in previous stage were inquired in this stage through randomized experimentation (pre- and post-test analysis). To conduct the experimentation, the groups were approached in three phases (Ps), where P-1 (pretest phase) was aimed to elicit their responses for safety performance and safety motivation in last 6 months (1 month before experimentation, i.e., August 2017; 3 months before experimentation, i.e., May 2017; and 6 months before experimentation, i.e., February 2017). At P-2 (experimentation phase) group, one was manipulated by providing safety incentives, whereas controlled group was not exposed to such influence. The outcomes of provision of incentives were further probed at P-3 (post-test; after 1 month, i.e., October 2017 and 3 months, i.e., December 2017), here, the main purpose was to see whether effects of incentives last for long or not? Results of each phase are provided hereafter.

3. Results

3.1. Stage I—safety culture and practices (February–March 2017)

The findings of Stage I are presented in Tables 1 and 2.

Table 1 reveals the results for safety culture and practices which was inquired through 14 items dichotomous scale. It is clearly evident that both employees and supervisors believed that SMEs lack most of the safety practices. For instance, both inferred that their organizations were poor at safety policy (according to 87% employees and 87% supervisors) and irregular safety meetings (69% and 58%, respectively, reported so). Further follow-up showed that there was absence of safety promotions (67% and 71%, respectively), safety training (84% and 83%, respectively), safe work practices (70% and 62%, respectively), safety records (57% and 62%, respectively), safety organizational structure (83% and 75%, respectively), as well as organizational (95% and 75%, respectively)

Table 2
Results for Stage I, results for *t* test

Respondents	N	Mean (SD)	Levene test *F* (sig)	*t*-Test for equality of means	
				t	*p*
Safety performance					
Employees	207	3.98 (0.82)	13.096 (0.512)	2.093	0.190
Supervisors	24	4.05 (0.75)			
Safety motivation					
Employees	207	4.09 (0.71)	13.096 (0.471)	4.086	0.302
Supervisors	24	3.99 (0.81)			

SD, standard deviation.

Table 3
Results for Stage II, clusters of employees

Personal factors	Cluster #1 ($n = 45$)			Cluster #2 ($n = 44$)		
	Average	Min	Max	Average	Min	Max
Age	32.5	27	37	33.05	26.5	39
Qualification (y)	9.25	7	12	9.65	7	12
Experience (y)	3.5	1.25	6.5	3.45	1.25	6.25
Working hours	9.25	7.5	10.5	9.5	7.75	10.75
Risk factor at job (at 1–10 point scale)	7.75	6.50	8.5	7.15	6.75	8.0
Safety performance (in last month)	4.25	3.00	5.00	4.33	3.00	5.00
Safety motivation	4.05	2.00	5.00	4.10	2.00	5.00

and employees (86% and 71%, respectively) commitment toward safety.

These findings help us infer that safety culture is not deep rooted in the manufacturing SMEs in Pakistan. The findings also highlight that of 23 respondent firms, 20 (87%) were poor at provision of safe environment. These findings are in-line with the findings of Ahmed et al [1], who noticed that developing countries are poor at provision of better working environment. Thus, first objective was achieved.

This stage also covered investigation of similarity and differences in safety performance and motivation of respondents (both employees and supervisors). For this purpose, independent sample t test was used (see Table 2), which reveals the results of comparison of employees and supervisors for their safety performance and motivation. There was no difference noticed in safety performance of employees and supervisors, $t = 2.093$, $p > 0.05$, two-tailed with employees mean = 3.98 (0.82) and supervisors mean = 4.05 (0.75). Similar results were observed for safety motivation of both the respondents ($t = 4.086$, $p > 0.302$). Thus, it was inferred that both employees and supervisors were at par in their performance and motivation for safety.

3.2. Stage II—group (cluster) formulation (April–May 2017)

Results of previous stage were used to find out the similarities and differences among firms, and to make selection of firms, for proceeding research stages. Here, only three firms were identified (of 23 respondent firms), where majority of the safety practices criteria were met: e.g., safety policy was written, manuals were provided and shared, safety meetings were called on regularly, safety practices were intact, and records were well maintained along with its audit. Similarly, both employees and supervisors of those firms reported that management and employees showed commitment toward the safety practices at work. Moreover, employees and supervisors of these firms also showed same results for their safety performance and motivation.

At this stage, focus was on the clustering/grouping of the three firms selected from results of previous stage, for experimental investigation. These firms were different in size, with respect to number of employees (covering 19, 28, and 42 employees each). For the purpose of experimental inquiry, all these employees were divided in two clusters (consisting of 45 and 44 employees, respectively). The characteristics of each cluster are presented in Table 3.

These clusters were formulated while considering the age, qualification, experience, working hours, and risk factors associated with job as the criteria. Past studies had also considered these factors as important predictors of safety performance and outcomes [39,40]. Both the clusters were constructed while considering the requirements of experimental design, where both controlled and experimental groups should be similar and at par [38]. Results of the analysis are presented in Table 3, where it is evident that both the clusters had similar characteristics with respect to age (mean = 32.5 and 33.05), qualification (mean = 9.25 and 9.65), experience (mean = 3.5 and 3.45), working hours (mean = 9.25 and 9.50), risk factors at job (mean = 7.75 and 7.15), safety performance (mean = 4.25 and 4.33), and motivation (mean = 4.05 and 4.10). These groups helped us move a step further for investigation.

Both these clusters were further investigated for similarities in safety performance and motivation. This investigation was made through multiple regression analysis, and the results are shown in Table 4, where it is evident that 14 safety practices jointly explained significant amount of variance in safety performance and motivation of both the clusters (r^2 change for safety performance in Cluster #1 = 0.412 and Cluster #2 = 0.393; r^2 change for safety performance in Cluster #1 = 0.345 and Cluster #2 = 0.298). These results help us infer that these 14 practices are causing significant change in both safety performance and motivation, where the minimum variance is 29% while maximum is 41%. The safety practices effect differed for both the clusters, where some practices had positive effects while others had negative. A profound look at the table highlights that safety performance of both the clusters was predicted by same factors (e.g., safety policy, $\beta = 0.110$, $p < 0.05$ and $\beta = 0.090$, $p < 0.05$; safety promotion, $\beta = 0.115$, $p < 0.05$ and $\beta = 0.180$, $p < 0.05$). Similarly, predictors for safety motivation are also common for both the groups (safety training schemes, $\beta = 0.342$, $p < 0.034$ and $\beta = 0.308$, $p < 0.012$; safety commitment at company level, $\beta = 0.305$, $p < 0.002$ and $\beta = 0.415$, $p < 0.001$; and safety commitment at employee level, $\beta = 0.115$, $p < 0.05$ and $\beta = 0.180$, $p < 0.05$). It was thus inferred that the formation of clusters was fair and both the groups were at par and could be used further in experimental investigation.

3.3. Stage III—randomized experimentation (June–December 2017)

Stage III was probed through three phases, where Phase 1 was a pretest analysis, whereas Phases 2 and 3 covered post-test analysis. Results of all three phases are presented as follows:

3.3.1. Phase 1 (P-1) pretest

Table 5 covers result for Phase 1, where safety performance and motivation for whole sample (both before and after grouping/clustering) is compared. Results of previous two stages were also considered as pretest and used in this stage. Repeated-measures analysis of variance results reveal that the mean scores and standard deviation (SD) of safety performance for one (Cluster #1: mean = 4.01, SD = 0.89; Cluster #2: mean = 4.22, SD = 0.68) and 3 months (Cluster #1: mean = 4.25, SD = 0.75; Cluster #2: mean = 4.33, SD = 0.67) were not different from 6 months' interval

Table 4
Results for Stage II, regression results of 14 safety culture and practices for each cluster.

Safety culture & practices	Safety performance				Safety motivation			
	Cluster #1		Cluster #2		Custer #1		Cluster #2	
	β	p	β	p	β	p	β	p
Written safety policy	**0.110**	**0.020**	**0.090**	**0.010**	0.090	0.120	0.008	0.201
Safety manual	0.004	0.287	0.104	0.304	0.012	0.220	0.095	0.123
Regular safety meeting	−0.051	0.310	−0.098	0.059	0.025	0.352	0.018	0.207
Safety promotion	**0.115**	**0.050**	**0.180**	**0.049**	0.120	0.252	0.305	0.125
Safe work practices	**0.210**	**0.012**	**0.300**	**0.004**	0.142	0.098	0.198	0.192
Safety inspection	−0.108	0.184	−0.204	0.210	−0.012	0.105	−0.025	0.145
Safety training schemes	0.300	0.201	0.210	0.120	**0.342**	**0.034**	**0.308**	**0.012**
Safety records	−0.045	0.352	−0.048	0.210	−0.012	0.320	−0.051	0.421
Safety audit	0.112	0.051	**0.140**	**0.050**	0.098	0.125	0.102	0.201
Formal safety organizational structure	**0.145**	**0.031**	**0.192**	**0.010**	−0.124	0.201	−0.109	0.145
Accident investigation and report	0.092	0.412	0.088	0.325	−0.080	0.210	−0.102	0.301
Accidental statistical analysis	−0.005	0.120	−0.104	0.201	−0.102	0.065	−0.115	0.078
Safety commitment at company level	**0.340**	**0.002**	**0.412**	**0.000**	**0.305**	**0.002**	**0.415**	**0.001**
Safety commitment at employee level	**0.241**	**0.000**	**0.190**	**0.002**	**0.215**	**0.012**	**0.261**	**0.023**
r^2 Change	0.412	0.000	0.393	0.001	0.345	0.011	0.298	0.007

The values in the bold show the significant relationships.

Table 5
Results for Stage III, Phase 1 (pre-test)

Criterion variables	Sample response before clustering/6 months before test (Feb 2017)	Cluster #1		Cluster #2		Sig
		One month before test (Aug 2017)	Three months before test (May 2017)	One month before test (Aug 2017)	Three months before test (May 2017)	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Safety performance	4.02 (0.88)	4.01 (0.89)	4.25 (0.75)	4.22 (0.68)	4.33 (0.67)	0.069
Safety motivation	4.05 (0.85)	4.05 (0.95)	4.05 (0.85)	4.08 (0.82)	4.10 (0.80)	0.187

SD, standard deviation.

results ($p > 0.05$; $M = 4.02$, SD = 0.88). It is thus to conclude that safety performance of respondents was not varying at high level in last 6 months. Same results were observed for safety motivation, where 6 months results (i.e., mean = 4.05, SD = 0.85) were not significantly different from 1 and 3 months results of both the clusters.

These results highlighted that sample safety performance and motivation remained stable over time and the clusters were suitable for manipulation in experimentation phase (Phase 2 and further).

3.3.2. *Phases 2 and 3—experimentation (test) post-test phase*

Tables 6 and 7 highlight the scores for safety performance and motivation before and after experimentation (immediate, 1, and 3 months after experimentation). The results provided in Table 6 highlight that there was meaningful difference between pre- and post-test results of safety performance of group with incentives as intervention (i.e., Cluster #1: mean = 4.01 and 4.65, respectively, $p < 0.05$). Contrarily, group with no intervention had no such difference (mean = 4.22 and 4.19, respectively, $p > 0.05$). Similar results are observed for safety motivation, where group with intervention was found to have significant change in motivation toward safety (i.e., mean 4.05 and 4.75, respectively, $p < 0.001$), whereas group with no intervention was unchanged (mean 4.08 and 4.11, respectively, $p > 0.05$). These results helped us conclude that safety incentives work as a source to improve safety performance and motivation at work.

In Phase 3, the results were further probed after 1 and 3 months' intervals. Here, results, presented in Table 7, revealed that the effects of incentive initially increased after 1 month (Δ mean = 0.08

Table 6
Results for Stage III, Phase 2 (outcomes before and immediately after experimentation)

Outcomes	Cluster #1 (with incentives)			Cluster #2 (without incentives)		
	One month before experiment (Aug 2017) mean (SD)	After experiment (Sep 2017) mean (SD)	t (p)	One month before experiment (Aug 2017) mean (SD)	After experiment (Sep 2017) mean (SD)	t (p)
Safety performance	4.01 (0.89)	4.65 (0.33)	13.65 (0.011)	4.22 (0.68)	4.08 (0.82)	−3.07 (0.542)
Safety motivation	4.05 (0.95)	4.75 (0.19)	18.19 (0.000)	4.19 (0.63)	4.11 (0.21)	1.05 (0.742)

SD, standard deviation.

Table 7
Results for Stage III, Phase 3 (post-test outcomes: immediate, after 1 and 3 months)

Outcomes	Cluster #1 (with incentive)			Cluster #2 (without incentives)			t (p)
	After experiment (Sep 2017) mean (SD)	After experiment (1 month; Oct 2017) mean (SD)	After experiment (3 months; Dec 2017) mean (SD)	After experiment (Sep 2017) mean (SD)	After experiment (1 month; Oct 2017) mean (SD)	After experiment (3 months; Dec 2017) mean (SD)	
Safety performance	4.65 (0.33)	4.73 (0.28)	4.20 (0.67)	4.19 (0.63)	4.21 (0.69)	4.23 (0.54)	15.096 (0.009)
Safety motivation	4.75 (0.19)	4.79 (0.16)	4.17 (0.59)	4.11 (0.21)	4.12 (0.22)	4.18 (0.55)	23.084 (0.000)

SD, standard deviation.

in safety performance; and Δ mean $= 0.04$ in safety motivation), but after that reduced again (i.e., at 3rd month: $+$ mean $= -0.53$; $t = 15.096$, $p < 0.05$ for safety performance and $+$ mean $= -62$; $t = 23.084$, $p < 0.001$). It is thus inferred that both safety performance and motivation reduced after 3 months of intervention.

4. Discussion

This study was based on experimental design (in three stages) to achieve four objectives, where the first objective was to examine the current status of safety culture and practices in the SMEs in Pakistan. The responses of both employees and supervisors highlighted the fact that the firms were lacking safety practices and culture. Majority of the firms were deficit of safety policy, regular safety meetings, safety promotions, safe work practices, safety training schemes, safety records, safety audit, formal safety structure, statistical analysis of accidents, as well as management and employee commitment toward safety. These findings thus highlight that the SMEs were poor at safety practices. The results of which were further elaborated when the 14 practices were regressed with safety performance and motivation. Safety policy, promotion, work practices, audit, organizational structure, as well as safety commitment at company and employee level predicted safety performance of both the clusters. It was also observed that safety training as well as commitment at both company and employee level predicted safety motivation of both the clusters. Thus, it was to conclude that most safety practices did not predict safety motivation (11 practices—except safety training scheme as well as commitment of company and employees) while half of the safety practices (seven—including safety manuals, meetings, inspection, training schemes, records, accident investigation, and statistical analysis) did not have any predictor power in explaining safety performance. It was also found that few of the safety practices predicted safety performance (e.g., safety meetings, inspection, records, accident statistical analysis) and motivation negatively (safety inspection, records, and statistical analysis), although these results were interesting but highlight the fact that these practices may not increase safety performance or motivation as these are only policy matters and not the concrete steps. These results are in-line with the past studies as well where it had been observed that safety provision in developing countries is merely slogan and not in practice. Furthermore, such countries are found to have less involvement of employees, top management, and even state toward achievement of goals of safe working environment [41,42]. Ahmed et al [1] also noticed that the organizations in Pakistan are poor at provision of safety practices, and often studies and investigation were merely done for the sake of documentation and the realization in practice were missing.

Second objective of the study was to evaluate the short-term effects of I/P programs on employees' safety performance and motivation (Stages II and III). For this purpose, experimental design was used, where findings of first research question (Stage I) were used to generate groups/clusters with similar characteristics, to have pre- and post-test experimental investigation. Two groups (experimental and controlled containing 45 and 44 employees, respectively) were formulated, and it was insured that both the groups were similar in their traits. Analysis results, from Stage II of the study, revealed that both the groups were similar (or had insignificant difference) in their major traits (age, qualification, experience, working hours, risk factors, safety performance, and motivation). Further assessment for determinants of safety performance and behavior of both the groups, through multiple regression analysis, also uncovered that safety performance of both the groups was predicted by safety policy, safety promotion, safety practices, formal safety structure, and safety commitment

of both the company and the employees. In contrast, safety motivation of both the groups was also predicted by same factors (i.e., safety training and commitment of both management and employees toward safety). These findings helped us conclude that the process of group formulation for experimental investigation was valid, as Kirk [38] commented that similarity between controlled and experimental groups is necessary to get valid results.

Both the groups formulated in Stage II were inquired at Stage III, where the main aim was to see the effects of incentives on safety performance and motivation of employees (both short and medium term—i.e., objective two and three, respectively). This study stage was further divided in three phases, where Phase 1 was a pretest phase, whereas Phases 2 and 3 were post-test phases. The pre- and post-test randomized experimentation showed that before experimentation (Phase 1, pretest), there was not a significant difference in employees' responses toward safety performance and motivation. These pretest results were based on data collected at three times (i.e., 1, 3, and 6 months before experimentation). This pre-experimental analysis highlighted the suitability of sample for further experimental investigation, as the pretest results were not different. Phase 2 covered the investigation of effects of safety incentives, used as intervention on experimental group, i.e., Cluster #1. The outcomes of the study revealed that there was a significant difference noticed in safety performance and motivation in the experimental group, whereas no significant change was observed in the controlled group. Consequently, post-test investigation (in Phase 3, i.e., after 1 and 3 months) revealed interesting results, as it was noticed that the effects of incentive remained positive for 1st month, but started replenishing after that, i.e., at 3rd month. These findings thus highlighted that safety incentives can only work as short-term intervention in the improvement of safety performance and motivation.

4.1. Implications of the study

This research endeavor points an important consideration for management, supervisors, policy makers, and other concerned stakeholders of safety at work. It is observed that safety at workplace swallows enormous amount of funds and needs greater attention from both the management and employees. It is observed that employees' attitude toward safety is the most important and organization should focus on it to get better safety-related outcomes [1]. Considering this point in mind, this study highlights the ways to improve employees' safety performance and motivation. The results reveal the positive role of I/P in predicting both the safety parameters, but it also highlights that the effects of these interventions are short-term and the effects get on replenishing with the passage of time. It is therefore to consider that to get the best employees' safety outcomes, incentive could only be a short-term intervention, and to get long-lasting effects, other interventions need to be made.

4.2. Limitations and future directions

Although this research endeavor is carried out in three stages, with experimental investigation design, yet it has some limitations. The foremost is the consideration of only two safety outcomes, i.e., performance and motivation. Future researchers could overcome this limitation while considering other outcomes like safety adoption, safety consciousness, safety voice behavior, and so forth. The findings probe safety culture through 14 items scale, where some practices are found missing or absent (e.g., safety policy, manuals, meetings, promotions, practices, training schemes). But presence in the absence of such practices cannot ensure the presence of safety culture because it is often observed that such practices are meant to meet the bureaucratic requirements only. Thus, future researchers should check for other practices, those are applicable to every sector differently. For instance, safety parameters like age of available equipment, maintenance conditions, availability of fittings, and quality of logistics could also be used to investigate the quality of safety practices at work. Furthermore, this study highlighted that safety incentives are only useful as a short-term intervention tool, while its effects mitigate with the passage of time. Kohn [43] also highlighted the fact that rewards are not a good predictor of one's behavior at work. He further criticized reward intervention philosophy by saying:

> *"Managers who insist that the job won't get done right without rewards have failed to offer a convincing argument for behavioral manipulation. Promising a reward to someone who appears unmotivated is a bit like offering salt water to someone who is thirsty. Bribes in the workplace simply can't work."* (p. 62)

It is therefore a point to think upon and future researchers could investigate the other forms of interventions in predicting employees' safety outcomes.

Conflicts of interest

All authors have no conflicts of interest to declare.

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Appendix. I

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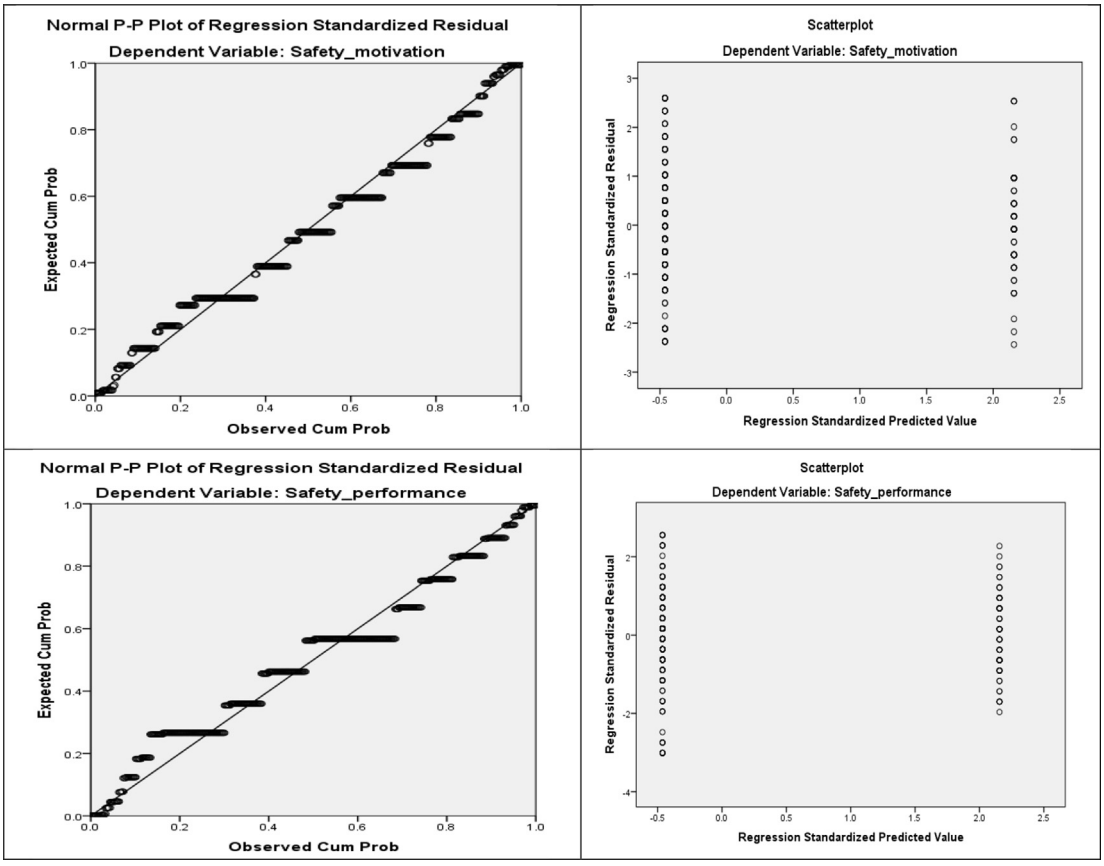

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