

Construction Workers' Perceptions of Safety Practices: A Case Study in Mexico

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Abstract

Organizational characteristics and worker perceptions are among the main factors affecting the safety climate in construction sites. Although some perceptions of the workers may seem absurd to others, these components are part of their reality. Worker behavior is an extremely important factor in workplace safety as many accidents are often caused by insecure actions, in which combinations of human behavior are the consequence of such perceptions. The aim of this study was to explore workers' perceptions of safety practices in their habitual work environment, a building site in Mexico. Worker perceptions of safety practices were captured using an instrument in which the following dimensions were taken into consideration: Education and training, Work motivation, Family and social integration, Work place integration, Safety awareness integration, and Accidents. The conclusion was that the workers have received very little education and possess a limited culture of safety awareness, which has led them to perceive that their lack of precaution is the main cause of accidents.

Keywords

Construction; Safety; Motivation; Work Integration; Accidents

1. Introduction

The construction industry is undoubtedly one of the most hazardous work environments, mainly due to the fact that it is carried out in a decentralized mobile manner; the workers of a construction company are generally dispersed on different projects and fronts, and are rotated continuously. Other characteristics of construction work that have an influence on the work environment include the system of temporary employment, payment per job and work instability. These characteristics within the industry make it more difficult to prevent accidents, train

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workers and supervise them in order to ensure that their tasks are performed safely [1].

The factors affecting a climate of safety in work centers have been identified, and the most important ones include: organizational characteristics, individual behavior and workers' perceptions [2]. Psychological science defines perception as a cognitive process of inferential and constructive character, by which a subject can generate an interior representation of what happens in the exterior, from information collected by the senses and information from memory [3].

Although the perceptions of a worker might contain specific components that could seem absurd to other people, these components are part of his reality, which are projected based on his knowledge and values. Thus, some authors conclude that the safety climate in construction sites is closely related to the perceptions and beliefs of the workers regarding the phenomenon of safety [4].

A number of studies have shown that, in general, the perceptions of management and workers usually differ. Wei *et al.* [5] studied discrepancies between the perceptions of administrators and workers regarding safety practices in construction sites. Their statistical analyses showed a significant difference between the two groups in their reflexive knowledge of work place safety, with one big difference in relation to decision making under risk. Reese and Eidson [6] also studied the perceptions of construction workers and their bosses; they found different perceptions between the two groups in concepts relating to the worker, such as: the value conceded to the worker, his productivity and the quality of his competencies; while keeping in mind that in order to work as a team and solve problems in conjunction, it is often necessary for some participants to change their perceptions. These authors emphasized the need to create more channels of communication between workers and their bosses, which could facilitate an exchange of ideas, without prejudice to the workers.

Worker behavior is an extremely important factor in construction site safety practices; many accidents often occur as a result of insecure actions, in which combinations of human conduct play a role, such as: overconfidence, lack of concentration, lack of motivation and irresponsibility; other factors that must be considered are, physical problems, lack of ability and the absence of adequate supervision. It would appear convenient, therefore, for company administrators to address the problem of safety, based on a deeper understanding of the psychology of worker behavior as well as the theories of human error [7]; this would allow the company to appreciate the importance of factors such as: motivation, work habits, attitudes, state of alertness, boredom, fatigue, etc.

Previous studies regarding the construction workers' perceptions of safety practices showed that organizational commitment and communication are among the main factors that generate integration and cohesion [8]. These factors, therefore, must facilitate the generation of a social capital which favors the ability to collaborate and share knowledge within the organization [9]; this in turn, if it is well managed, can lead to safer worker behavior in the construction site.

In Mexico, as in other developing countries, there are many small construction companies—mainly involved in housing construction—each one of which employs only a few workers. It is estimated that medium, small and micro businesses (PYMES) represent more than 97% of all the construction companies in this country [10]. Thus, in practice, these companies do not provide even minimum conditions of safety or sufficient training, nor do they establish risk prevention programs. The argument presented for the above situation, which is reasonable but without legal or moral value, is that these companies have to deal with permanent problems of survival.

In 2011, the first norm for safety in construction in Mexico came into effect [11]; however, given the number of accidents that continue to occur in construction sites, it is clear that, as yet, no positive effect can be observed since its application [12]. In general, a high percentage of legal ordinances are not complied with since there are no coercive and/or psychological mechanisms that could bring about a change in behavior by the people involved [13].

According to the ARCTM model (Accident Root Causes Tracing Model), accidents occur due to three main causes: not identifying unsafe conditions before initiating a job; continuing work on the job in spite of someone having identified the unsafe conditions; and deciding to act in an unsafe manner regardless of conditions in the work place [7]. The last two causes are clear examples that the perception of a reality is a strong component which can influence worker behavior.

The aim of this study was to document workers' perceptions of safety practices in their work environment, a construction site in Mexico, in order to analyze their particular manner of interpreting the phenomenon.

2. Methodology

The approach of this study was exploratory, as very few studies on health and safety in the construction industry

have been carried out in the geographical context of the Mexican Southeast. A case study was chosen, which can be considered typical, consisting of the construction of one stage of 52 homes in a housing development in Merida, Mexico.

Unit of analysis was the worker carrying out building tasks in a construction site; the sample comprised all the workers employed at the selected construction site during the study period.

In order to document the workers' perceptions of safety practices a questionnaire was used in which six dimensions were considered: Education and training (6 items), Work motivation (10 items), Family and social integration (6 items), Work environment integration (8 items) Safety awareness integration (14 items) and Accidents (5 items). In order to define the profile of each participant in the study, an additional section was included in the questionnaire in which personal data was captured (6 items). The structure of the questionnaire was based on a document elaborated by the Occupational Safety and Health Research Center of Virginia Tech [14].

The instrument was applied in a pilot study carried out on 20 workers (12 working in the case under study and 8 working in another project). From the feedback of this application, the final version of the instrument was obtained which consisted of four types of questions: dichotomous (e.g. Do you have children? yes or no), multiple choice (e.g. What is your maximum educational level? none, primary, secondary, high school) on a Likert type scale (e.g. Do you feel the need to learn new things? never, rarely, sometimes, almost always, or always) and open questions (e.g. What do you think caused the accident?).

The questionnaire was applied with the voluntary participation of 60 subjects, all of which worked in the construction project selected for the study (the subjects who had participated in the pilot study were not included); 7 people working in the construction project declined to participate. The questionnaire was applied on the construction site during working hours. The instrument was applied by reading the questions and asking the worker to give their answers verbally. Application time ranged from 15 to 25 minutes.

In order to obtain additional sources of information, relevant sections of the instrument were applied to the two residents (supervisors) employed in the project, giving them the opportunity to manifest their perceptions of the workers under their direction. Direct observations were also carried out on the site over a period of 5 weeks, out of the total study period of 25 weeks. These data were gathered using a document containing specific behavior to be observed, which could be compared to the answers given by the workers; examples of selected behavior were: if the worker can add up segments or calculate areas (Education and training), if the worker performed his tasks with a good attitude (Motivation), if the worker was indifferent to dangerous environments or behavior (Safety awareness integration), etc.

Data analysis consisted in descriptive statistics: proportions and graphs (radial). For the open questions, the responses were categorized beforehand.

In order to verify internal consistency in the instrument, Cronbach's alfa of the items measured with Likert type scale was calculated; the value of this statistic was 0.66. This was lower than 0.70, which is generally accepted; however, according to some researchers, the lower value is acceptable as proof of homogeneity of the items for phenomena which have not been widely studied in the context of reference [15].

3. Results

3.1. Worker Profile

Table 1 presents the distributions of the main characteristics defining the profile of participating workers: Position occupied (most of the workers were experienced construction workers), Age (the majority were over 35 years old), Manner in which they learned the trade (the largest groups corresponded to two categories: with a master builder or by imitating) and Years of work experience (the sample was distributed uniformly in three groups: between 1 and 5 years, between 6 and 10 years, and over 10 years). In family environment, 80% of participating workers said they had a partner, and 72% had at least one child.

3.2. Education and Training

Sixty two percent of the workers reported having completed, at least, primary education (6 years); 23% had completed secondary education (9 years); and 3% had completed high school (12 years). Forty percent said they were able to read well.

Fifty eight per cent claimed to be able to carry out basic mathematical operations (add, subtract, multiply and

Table 1. Distribution of the main characteristics defining the profile of workers participating in this study.

Characteristics	%
Position	
Master builder	12
Experienced construction worker	65
Assistant	23
Years of experience in the job	
Less than 1	3
Between 1 and 5	30
Between 6 and 10	30
More than 10	37
Manner in which the trade was learned	
Training course	0
Alone	17
By imitation	41
With a master builder	42
Age	
Under 20 years old	12
Between 20 and 25	25
Between 26 and 30	18
Between 31 and 35	7
Over 35	38

divide). This was evaluated by asking several workers to add up some lengths and calculate areas; the experienced workers and master builders were able to do this but not the assistants. The perception of the two supervisors directing the workers was that between 60% and 70% of the workers knew how to do basic mathematical operations.

Forty two percent said that they had been given a training course to improve their performance. Seventy eight percent said they would like to take training courses, and eighty three percent confirmed that they wanted to learn new things. Throughout the study period, no training activity for the workers was observed to have been promoted by the construction company. One of the supervisors commented that, on occasions, the company has provided training for the workers, while the other said that he had never witnessed any training activity at all; both coincided in that most of the workers wanted to be trained and were interested in learning new things.

3.3. Work Motivation

According to their answers, in general, the workers appeared to be quite well motivated with the work they do in the construction site. Among the items considered in the study, those that showed the highest percentages of approval were the following: The work I do is important (95% of the workers), I feel good about the work I do (93%) and I like to work in different activities in the construction (93%). The items that obtained the lowest percentages of approval were related to their economic income. **Table 2** shows the percentages of workers who confirmed or denied the statements presented regarding motivation.

The two supervisors manifested contrasting perceptions in relation to worker motivation. One expressed that the majority only work for the money, and that they work in construction because it is the only job they could

Table 2. Percentages of workers who admitted or denied the statements relating to work motivation.

Items	Perception (%)	
	Yes	No
The work I do is important.	95	5
I feel good about the work I do.	93	7
I like to work in different construction activities.	93	7
I want to work in construction permanently.	78	22
I feel that I am appreciated in my work environment.	73	27
I do not think that the people who leave to work in another state do better.	70	30
This is not the only job I can get.	53	47
I do not intend to work in another state.	52	48
I am paid well.	43	57
I do not work only for the money.	33	67

get; that the workers think they are not paid enough, that they have no wish to work in another state or county and that they do not feel good about the work they do; whereas the other supervisor expressed contrasting opinions about each one of these statements.

3.4. Family and Social Integration

According to their answers, in general, the workers show good family and social integration. Among the items considered in the study, those with the highest percentages of approval were the following: My family appreciates me (95% of the workers), My economic contribution is important to my family (92%) and My family values my work (90%). **Table 3** shows the percentages of workers who confirmed or denied the different statements referring to family and social integration.

Direct observations showed that the majority of the workers bring homemade food to work; and several workers bring their sons to the site to work as assistants.

3.5. Work Environment Integration

According to their answers, in general, the workers showed good work environment integration. Among the items considered in the study, the highest percentages of approval were found for the following: It is good that the workers are told how to do things (93%), I like to do things better than other people (93%) and I have a good relationship with my boss (92%). **Table 4** shows the percentages of workers who confirmed or denied the statements regarding work environment integration.

The supervisors directing the work site were of the opinion that the workers respected their authority and that there was a good relationship between both parties. Direct observations showed: a cordial relationship between workers and supervisors; the workers carried out their tasks with organization in collaborative groups; the workers, when necessary, prolonged their workday or postponed their breaks until the task was completed. Some arguments were also observed, which could have become violent, between the personnel responsible for distributing materials in the work site and the construction managers as a result of their respective interests entering in conflict.

3.6. Safety Awareness Integration

Forty seven per cent of the workers said that they are concerned about work-related accidents, and 10% manifested that they feel capable of preventing them. Eight per cent said that they had occasionally received written material (booklet or pamphlet) describing how to work safely on the construction site; and 2% reported having been given a preventive medical examination.

Table 3. Percentages of workers who admitted or denied the statements relating to family and social integration.

Items	Perception (%)	
	Yes	No
My family appreciates me.	95	5
My economic contribution is important to my family.	92	8
My family values my work.	90	10
I have friends outside the work environment.	83	17
My friends appreciate me.	70	30
I am the only one working in my family.	42	58

Table 4. Percentages of workers who admitted or denied the statements relating to work integration.

Items	Perception (%)	
	Yes	No
It is good that the workers are told how to do things.	93	7
I like to do things better than my co-workers.	93	7
I have a good relationship with my boss.	92	8
My boss respects me.	85	15
My boss gives me instructions.	80	20
I would like my boss to tell me that I work well.	72	28
I prefer to work in a group rather than alone.	60	40
I agree with my boss's opinion of my work.	37	63

Regarding behavior which might put workers at risk, included in this study, some participants stated that the most common actions practiced or perceived on the site are: Consumption of alcohol on a regular basis (88%), Workers do not use personal protective equipment (83%) and a feeling of being prone to accidents (57%). **Table 5** shows the percentages of workers who confirmed or denied practicing or perceiving ten hazardous behaviors in the work site.

From direct observation it was possible to note careless, irresponsible behavior among workers in evidently risky situations, such as: leaving pieces of wood with nails in walkways; working on scaffolding sustained with concrete blocks or wooden boards, instead of assembling the metal scaffolding available on the construction site; setting ladders on unstable ground; leaving an object on the edge of a roof for several days, knowing it could fall at any minute, etc.

No pamphlets or posters promoting safety practices were found on the construction site. There was no knowledge of any worker having received a medical examination for preventive reasons. One of the supervisors expressed the opinion that most of the workers were concerned about the possibility of experiencing an accident, while the other one expressed quite the opposite.

Direct observations also corroborated that the workers did not use personal protective equipment and this was confirmed by the two supervisors; most of the workers did not even use safety boots to work, workers wearing sandals were observed walking in places where pieces of all kinds of materials were lying around (steel, concrete blocks, wood, etc.). One of the supervisors commented that the workers did not feel comfortable using protective equipment, while the other said the opposite. With reference to the aspect of tired workers, it was possible to observe workers taking frequent breaks to rest. In relation to alcoholic beverages, three workers were seen drinking on the construction site and a number of empty containers of this kind of drinks were seen lying around. Both supervisors stated that the workers did not consume alcoholic beverages on this site. Regarding visual deficiencies in the workers, two subjects had difficulty reading the questionnaire used in the study, which would suggest that they might also have problems performing their tasks.

Table 5. Percentages of workers who admitted or denied practicing or perceiving hazardous behavior in the construction site.

Items	Perception (%)	
	Yes	No
Regular consumption of alcoholic beverages.	88	12
Not using protective equipment.	83	17
Feeling prone to accidents.	57	43
Discomfort using protective equipment.	45	55
Working when tired.	33	67
Lack of concentration on the job.	22	77
Feeling that your co-workers' behavior affects your safety.	18	82
Working with visual impairment.	8	92
Doing your work in an unsafe manner.	7	93
Consume medications in order to work better.	3	97

With respect to the degree of attention paid to the job in hand, it was possible to observe the following behavior: listening to very loud music, chatting while they work, and allowing themselves to be distracted by street vendors or visitors. Besides this, some workers were seen to push each other around on the roofs as a joke, and to jump from one roof to another, a distance of approximately one meter. No workers were observed consuming medication or drugs; however, one of the supervisors estimated that approximately a third of the workers consumed medication or drugs in order to work better.

3.7. Accidents

Forty per cent of the workers reported having had at least one accident during their working life in construction. Of this group, 8% graded their accident as very serious, 25% as serious and 67% as minor. As for the number of workdays lost as a result of the accident: 17% said that the insurance institute covered more than one month of incapacity, 17% more than a week and 17% one week or less (the remaining percentage said that they did not have any days of incapacity). According to the workers, the main causes of their accidents were: Carelessness or recklessness (67%), Unforeseen risks (21%), Lack of personal protective equipment (8%) and Tools in bad condition (4%); this was an open question. Sixty three per cent of the workers manifested that a report on the accident was elaborated.

Figure 1 shows a radial graph of the percentages of workers who reported having had an accident. It is classified according to six dichotomous variables: Position occupied (master builder or experienced construction worker-assistant), Education (with basic studies—without basic studies), Manner in which the trade was learned (with a master builder-alone), Years of work experience (10 years or less—more than 10 years), Age (30 years or less—more than 30 years) and Children (yes—no). For example, of the 43 workers who had children, 22 had experienced a work related accident (51%), and of the 17 participating workers who did not have children, 2 had been involved in a work-related accident (12%).

4. Discussion

More than a third of the workers (38%) reported not having received primary education (six years of study), which has been compulsory in Mexico since 1867; this means that at least 15% of the experienced construction workers or master builders—who are considered the most qualified—do not have this minimum level of education. More than three quarters of the workers (77%) had not completed their basic education (9 years of study), which has been compulsory in Mexico since 1993.

More than half of the workers (60%) admitted not being able to read very well, in other words, at least 37% of the experienced constructors or master builders lacked this ability; this does not necessarily mean that they were

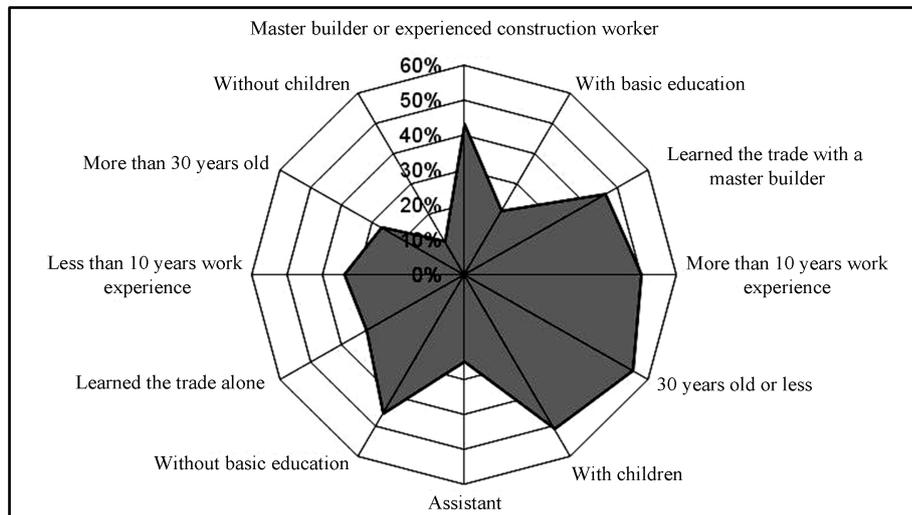


Figure 1. Percentage of workers who have had accidents in accordance with the dichotomous variables: position, education, manner in which the trade was learned, years of work experience, age, and children.

never taught to read, it is possible that they simply became functional illiterates due to the fact that they were unable to reach an educational level that would allow them to fully develop this skill [16]. According to the statistics, in Mexico, 7% of the population (15 years old or above) cannot read or write [17], and on a global scale, 17% of the same population group is found to be similarly marginalized [18].

More than half of the workers (58%) manifested that, during their working life, they had never received training courses to improve their work performance. With respect to this, the Federal Labor Law of Mexico—article 153-A—[19] states that “employers are obliged to provide every worker with, and the worker to receive, training or instruction in their work which will allow them to improve their standard of living, work competency and productivity”. The great majority of workers (83%) manifested a desire to learn new things, from which we can assume that any training plans that the company might organize would be very well received by the workers. The workers did not appear to correlate training or instruction with the possibility of achieving a better standard of living, thus, they seemed passive and were not observed to take the initiative of demanding the implementation of their right to training courses.

According to these results, it is quite important that authorities attain the constitutional duties to provide basic education to all Mexican citizens; as well as to enforce compliance with the Mexican laws in order to assure construction employers provide training to workers.

As for their motivation, most of the workers showed a high level of concepts relating to intrinsic motivation, such as feeling that their work is important, liking or enjoying the work they do, or feeling that they are appreciated in the work place. However, most of the workers showed a low level in factors relating to extrinsic motivation, such as: feeling underpaid, working only for the money and feeling the need to seek work in other places in order to find better opportunities. The level of satisfaction experienced by construction employees—professionals and workers—in relation to intrinsic factors, and the dissatisfaction manifested in relation to extrinsic factors have been reported in a number of studies. Didibhuku and Nthabiseng [20] pointed out that the very nature of a constructor’s work, which generates physically tangible and lasting structures, is motive of pride and satisfaction for everyone involved in the realization of a project. In an investigation based on six case studies dealing with the same context as the present work, Castillo [21] concluded that the factors causing dissatisfaction were all extrinsic: safety in the work place, company policies and practices, and economic compensations.

The advice is then for construction organizations to design remuneration strategies that promote an adequate performance of workers, instead of using only typical approaches to payment such as that based on time and/or piece work. They should also review the management of human resources within their organizations in order to manage satisfaction of workers.

The workers reported having a good level of family and social integration. Most of the construction workers, in the region where this study was conducted, come from rural communities, eminently indigenous [22]. In order

to work on construction sites which are generally located in urban areas, these people must leave their communities on Monday and do not return until Saturday. More than half of the workers mentioned that they were not the only member of the family working; some of the wives also work in the city throughout the week. This situation does not provide a favorable context for good family and social integration given that it combines factors such as poverty and migration which are well recognized as structural causes of family fragmentation [23].

It is difficult to advise on the promotion of workers' family unity, since this involves several factors related to deeply rooted family customs and practices. It is clear, however, that formal education and formation on human values is a key factor to attain the unity of family.

On the other hand, many construction workers employ their sons as assistants, which show the existence of a bond between father and son that may be strengthened by their collaboration in the work place. However, it is also one of the causes of the low level of education of these workers since they are taken to the work site as soon as they are able to carry materials or mix mortars, thus abandoning their formal education. This must also be recognized as a factor which perpetuates the vicious circle of poverty [24].

The workers manifested a good level of integration in the work environment. Due to the fact that construction work in itself is a highly collaborative activity, it is common for new workers to become part of a group or work crew in which they learn to combine their efforts with those of their co-workers. This way of learning the trade facilitates the development of a sense of belonging to the group and promotes solidarity. Another characteristic influencing their integration to the work environment is that fact that very often the crew members all come from the same community or even the same family making their work integration a continuation of their family and social integration. The workers also commented that their work is not well appreciated by their bosses, which is consistent with a report by Reese and Eidson [6] who concluded that the perceptions of workers and bosses tend to differ in relation to the competency of the former.

With respect to a culture of safety awareness, very few workers (10%) said that they were capable of preventing accidents on the work site, and less than half (47%) expressed concern regarding the possibility of an accident. The workers confirmed that they do not use protective equipment and that they consume alcohol on the work site; this was corroborated by direct observation. It was also possible to observe a variety of hazardous behavior and a lack of order on the work site. Generally speaking, very little integration to a culture of safety awareness was found; this would seem to be a consequence of the fact that the company does not consider this a priority. A similar situation was reported by Solís *et al.* [25] in a study case dealing with the same context in a massive housing construction project. It would appear, therefore, that a joint coordinated intervention involving the authorities, business associations and trade unions is required in order to break the vicious circle of: no compliance, no supervision, no consequences.

Forty percent of the workers admitted having had an accident during their working life in construction work. From the data gathered, an average period of work experience can be estimated in 8.66 years (520 years among 60 workers); and from this, an annual rate of 4.6 accidents per 100 workers (40/8.66) can be calculated. The Mexican Institute of Social Security (IMSS—for its acronym in Spanish) [26] reported a rate of 3.9 accidents per 100 workers for the group of economic activity denominated "Construction of buildings and civil engineering projects". It can be assumed, therefore, that the group participating in this study has been exposed to dangers and the individuals have suffered damage to their physical integrity which can be considered as typical of construction work in Mexico. In a published article dealing with serious accidents in construction sites located in the same region [12], 22 accidents were reported in a little under two years, in which 15 workers died and 82 were injured; the main dangers documented were: the collapse of structural elements, the use of ladders and scaffolding, electric shocks, and work in confined spaces.

It is necessary to notice that though these accidents are usually reported in the news, there are no evidences on the subsequent actions implemented by managers and the investigations carried out by authorities to determine responsibilities. That is why authorities should enforce the law in order to ensure the safety of workers.

An analysis of the data gathered from the workers in this study, who reported having had an accident, showed that the groups in which more accidents occurred, included subjects with the following characteristics (Figure 1): they occupied positions that required greater abilities (master builder or experienced construction worker), they had the most experience in construction work (more than 10 years), they had the best formation in the trade (guided training), they were in the optimal stage of physical capacity (30 years old or less) and they had important family responsibilities (children). All these characteristics, apparently, define the kind of worker who is, relatively speaking, the most qualified, capable and responsible, and who would most likely be competent in risk

prevention.

However, a sixth characteristic of the subjects who had reported having an accident was that the majority had not received a basic education (**Figure 1**). In addition, as was mentioned previously, it was found that these workers are provided with little or no training for the job; this combination may have a greater influence on the accident rate than the other five characteristics mentioned above.

Most of the workers (67%) reported feeling that the accidents were a consequence of their own carelessness, and because of this they assume responsibility apparently without realizing that the company in charge of the construction site is mainly responsible for implementing the required preventive actions, such as; providing training courses, organizing preventive measures on the work site, supervising safety practices, promoting worker participation, etc. It is also important to point out that, according to information provided by the workers, one out of every three accidents was not reported to the authorities, in direct violation of article 504 of the Federal Labor Law [19] and article 51 of the Mexican Social Security Law [27], which states that employers must elaborate detailed reports of the causes and circumstances leading to these accidents.

Generally speaking, the two supervisors of the construction site under study expressed contrasting opinions in relation to their knowledge of the workers and their perceptions of safety practices in the construction site. This might be attributed to the fact that the construction company does not have a policy or a risk prevention system and therefore does not gather systematic information pertaining to the workers; moreover, the supervisors gave no sign that the observation of hazardous conditions or acts and the implementation of measures to eliminate or mitigate such risks were among their priorities.

5. Conclusions

The workers participating in this case study:

Have a low educational level and have received very little training to improve their competency for the job or to allow them to learn how to prevent risks. Due to the fact that this situation is generally accepted throughout the building trade, the workers do not perceive that the lack of training programs can affect them negatively. Nevertheless, they show a desire to learn new things and to be trained.

They feel motivated with the work they do; they like what they do and want to continue doing it in the future.

They see themselves with a good family and social integration, within their own cultural context and system of values.

They see themselves as well integrated to the work environment, aided by their cultural affinities and the manner in which the construction work is organized.

They show poor integration to a culture of safety awareness; the same can be said of education and training. Since this situation is generally widespread, the workers seem unable to perceive that the lack of these opportunities has a negative effect on their lives.

Their perception is that they are the main actors in the prevention of accidents, and that being careful is the most important way to avoid them.

Workers that have been provided with a formal education and training on safety practices are expected to change their perception on safety issues; this should eventually encourage their participation on the attainment of safety in the construction site.

According to these conclusions, all parts involved in the construction industry should consider a major concern the improvement of work conditions in construction projects. Authorities should monitor more effectively the compliance with the legal framework; construction companies should improve their organizational culture and attain social targets; labor unions should be more energetic when demanding safe working conditions; and construction clients should influence the safety of workers by including safety clauses in contracts.

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