

Workers' safety in the construction industry in the southern West Bank of Palestine

M.I. Al-Sari¹ and I.A. Al-Khatib²

سلامة العاملين في صناعة البناء في جنوب الضفة الغربية في فلسطين

ماجد إبراهيم الصريع، عصام أحمد الخطيب

الخلاصة: لا تتوافر سوى معطيات قليلة حول السلامة في صناعة البناء في فلسطين. وقد كان الهدف الرئيسي من الدراسة هو تقييم خبرات العاملين ومداركهم حول السلامة في مواقع البناء في محافظتي الخليل وبيت لحم في الضفة الغربية. وقد تم استيفاء استبيان ممنهج عن طريق إجراء مقابلات مع 349 عاملاً في البناء. وقد تعرّض من المستجيبين للدراسة 34.6% إلى حوادث متعلقة بالعمل، بينما ذكر 13.0% من العاملين خلّو موقع العمل من لوازم الإسعافات الأولية وذكر 65.6% عدم وجود متخصصين مدربين على الإسعافات الأولية، وذكر 35.8% أن مواقع العمل تخلو من أدوات السلامة، وذكر 83.7% أنهم لم يتلقوا أي تدريب عن السلامة. ويدرك العاملون أن الوعي والتدريب هما أكثر العوامل تكراراً من حيث التأثير على سلامة العاملين، وأن موقف رئيس العمال له أكبر الأثر على سلامة العاملين. ودلّت الدراسة على أن هناك حاجة إلى المزيد من تعزيز القوانين الفلسطينية الحالية الخاصة بالسلامة.

ABSTRACT There are few data about safety in the construction industry in Palestine. The main aim of the study was to assess worker's experiences and perceptions of safety at construction sites in Hebron and Bethlehem governorates of the West Bank. A structured questionnaire was completed through direct interviews with 349 construction workers. Of the respondents, 34.6% had experienced work-related accidents, 13.0% and 65.6% indicated that their workplace did not have a first-aid kit or trained first-aid specialist respectively, 35.8% reported that their work sites did not have safety tools and 83.7% had not received safety training. Workers perceived that awareness and training were the most frequent factor affecting workers' safety, with the foreman position having the greatest impact on the workers' safety. Greater enforcement of the current Palestinian safety laws is needed.

Sécurité des travailleurs dans l'industrie du bâtiment dans le sud de la Cisjordanie (Palestine)

RÉSUMÉ Les données sur la sécurité des travailleurs sont rares dans l'industrie du bâtiment en Palestine. Le principal objectif de l'étude était d'évaluer l'expérience et la perception de la sécurité chez les travailleurs sur les sites de construction des gouvernorats d'Hébron et de Bethléem en Cisjordanie. Un questionnaire structuré a été rempli lors d'entretiens individuels avec 349 ouvriers du bâtiment. Au total, 34,6 % d'entre eux avaient une expérience des accidents du travail ; 13,0 % et 65,6 % respectivement ont indiqué que leur lieu de travail n'était pas équipé d'une trousse de premiers secours ou ne bénéficiait pas de la présence d'un secouriste qualifié ; 35,8 % ont déclaré que leur lieu de travail ne disposait pas d'outils de sécurité et 83,7 % n'avaient pas reçu de formation sur la sécurité. Les travailleurs considéraient que la sensibilisation et la formation étaient les facteurs influant le plus souvent sur leur sécurité, et que le rôle du contremaître était très important en la matière. Une application plus stricte des lois palestiniennes sur la sécurité est nécessaire.

¹Faculty of Graduate Studies, Birzeit University, Birzeit, West Bank, Palestine.

²Institute of Environmental and Water Studies, Birzeit University, Birzeit, West Bank, Palestine (Correspondence to I.A. Al-Khatib: ikhatib@birzeit.edu; ikhatib2012@yahoo.com).

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Introduction

As in many other countries, the construction sector in the occupied Palestinian territories is the largest industrial sector and has the highest accident rate [1–9]. The safety and protection of the workforce are therefore major concerns. Occupational health risks among construction workers are not limited to accidents. These workers are also among the highest occupational risk group for respiratory diseases, pneumoconiosis, skin diseases, back and musculoskeletal disorders and poisoning [10–16]. During recent phases of reconstruction in the occupied Palestinian territories, much of it funded by foreign aid money, priority was given to the achievements of the projects, possibly to the detriment of the safety of the workforce. Despite improved legislation regarding safety in the construction industry, first enacted in the year 2000 [17], the application of the Palestinian labour laws has not succeeded in reducing the rate of accidents in the West Bank and the rate of work injuries that occurred within the construction sector were reported by the Ministry of Labour (MoL) as 10.3% and 13% for the years 2008 and 2009 respectively [18,19].

The need for this present research stemmed from the lack of studies regarding safety in the construction industry in Palestine. The main aim of the study was to assess worker's experiences and perceptions of safety at construction sites in Hebron and Bethlehem governorates of the West Bank.

Methods

Study setting and sample

The area under study was Hebron and Bethlehem governorates in the southern part of the West Bank of Palestine. The study sample was people working in the building and construction trades. The total number of workers in this sector was estimated at about 4250. A

sample of 349 workers were selected at random, taking into account 8 common activities: building, reinforced steel fixing, plastering, tiling, painting, stone pointing, electrical installations and sanitary installations. The size of the sample was determined using the procedure described by Hogg and Tanis [20].

Data collection

A questionnaire to collect construction workers' views and experiences of health and safety issues was designed for this study after a review of other studies in the literature. It was tested through interviews with a subsample of workers, and then amended. The questionnaire included 42 closed-ended questions and consisted of 5 main sections: general information, awareness and education, occupational health and safety, social safety and legislation. The questionnaire concerned the type of work done, actual experience of accidents or occupational diseases, workers' perceptions about safety risks and their causes, availability of safety equipment, working hours, work environment, as well as safety procedures, emergency plans and medical services, workers' education and awareness, site inspections, work and health insurance, work contracts and workers' awareness of the regulatory authorities.

The questionnaire was completed through direct interviews with the workers in the period from May to July 2010. The employers were first contacted to authorize the survey. Then the site managers or workers supervisors were informed and requested to brief the workers about the study objectives to facilitate the process of data collection.

Analysis

Analysis of data was carried out using SPSS, version 15. Correlation matrices and linear regression were used to assess the relationship between the different variables.

Results

The socioeconomic characteristics of the workers are shown in Table 1. Of the sample 99.4% were men, the greatest proportion were aged 16–20 years (44.5%), had 1–3 years experience (28.4%), earned 1000–2000 shekels per month (49.9%) and were unskilled labourers (30.7%).

With respect to the perception of risks, the majority of respondents (85.1%) perceived their job as risky. This proportion varied slightly according to the profession; the perception of risk was highest among stone-pointing technicians (92.9%) (due to the risk of falls from unsafe scaffolding) and the lowest among painters (82.4%).

The availability of first-aid tools, instructions and a trained specialist at the construction site is a safety requirement according to Palestinian labour laws. Of the survey respondents 69.4% were aware of the availability of first-aid materials at their construction site (Table 2). However, the survey also showed that many contracting companies were not complying with the requirement to hire a first-aid specialist at construction sites; only 10.7% of the respondents reported that a first aid specialist was available at the workplace, 65.6% said that one was not available, while 23.5% did not know whether there was a first aid specialist available or not (Table 2).

A total of 137 workers (39.3%) reported that they were not using safety tools. When asked the reasons why not, 35.8% of this subgroup reported that safety tools were unavailable at the construction site, 13.1% that the tools were out of service, 10.9% did not know how use them, 14.6% worked indoors and 16.1% said did not like using them (Table 2).

Of the respondents 95.1% indicated that their main perceived risk was the risk of accidents while only 4.6% reported their main risk was occupational disease. This is borne out by workers'

Table 1 Background characteristics of the construction workers interviewed (n = 349)

Variable	No. ^a	%
Age (years)	39	11.2
16–20	155	44.5
21–30	81	23.3
31–40	53	15.2
41–50	17	4.9
51–60	3	0.9
> 60	39	11.2
Work experience (years)		
1–3	99	28.4
4–7	71	20.4
8–11	57	16.4
12–15	46	13.2
16–20	30	8.6
> 20	45	12.9
Income (NIS)		
< 1000	16	4.6
1001–2000	173	49.9
2001–3000	123	35.4
3001–4000	26	7.4
4001–5000	7	2.0
> 5000	2	0.6
Job title		
Electrician	13	3.7
Stone pointer	14	4.0
Sanitary ware technician	14	4.0
Painter	17	4.9
Tiler	18	5.2
Plasterer	31	8.9
Steel technician	38	10.9
Building technician	70	20.1
Unskilled labourer	107	30.7
Other	27	7.7

^aData missing in some categories.
NIS = new Israeli shekels.

actual experiences; 34.6% of respondents reported having ever experienced any work accidents in their lifetime but only 14.3% reported suffering from a work-related disease. As shown in Table 2, the main cause of the accidents according to the subgroup who had experienced them was carelessness (31.0%), followed by lack of safety measures (22.5%) and stress due to excessive overtime hours (15.5%).

Workers also felt undertrained, with 38.5% believing that training and awareness were the most important factors affecting workers' safety, while others indicated contractors' and workers' risk perceptions were the most important (16.1%) and 14.1% felt that inexperience among contractors and workers was the most important factor (Table 2).

On the other hand, respondents' perceptions that the persons or

organization with the greatest impact on the safety of the construction site were firstly the foreman (47.7%), followed by the safety officer (17.8%), the site engineer (12.9%) and the project manager (12.0%). Only 8.6% of respondents believed that the role of the regulatory authority was the most important. There was little variation in these opinions according to workers' job or seniority (Table 3).

When asked about effective strategies to promote a safety culture, respondent workers reported that safety training and education (47.7%) and communication (33.6%) would be the most effective, rather than inspection and enforcement (17.2%). However, these strategies were not widely employed in reality, with only 16.3% of the workers reported having received any safety training, although 92.2% mentioned occasional (47.6%) or frequent (44.7%) promotion of safety during work by their supervisors. By contrast workers reported that their workplaces were inspected by the MoL frequently (10.3%), occasionally (28.7%) or never (61.0%).

Discussion

Workers' perceptions about safety is an important element in promoting a safe working environment, as it contributes to the safety situation and allows the workers' point of view to be considered in formulating workers' safety policies in the construction sector. In general, this study suggests that the level of safety at workplaces in the West Bank was relatively low and building contractors were not taking safety issues into concern. However construction workers did show positive perceptions toward risks and safety.

A great majority of workers (85.1%) perceived their job as risky, 35.8% reported that their work sites did not have safety tools and 34.6% had experienced at least one work-related

Table 2 Construction workers' knowledge and perceptions about onsite safety and reason for accidents (n = 349)

Item	%
Is there a special first aid employee in your workplace?	
Yes	10.7
No	65.6
Don't know	23.7
Are there first aid materials in your workplace?	
Yes	69.4
No	13.0
Don't know	17.6
Why you are not using safety tools? (n = 137)	
Not available	35.8
Inadequate/out of service	13.1
Don't know how to use them	10.9
Work indoors	14.6
Don't like to use them	16.1
Other reason	9.5
Have you experienced work accidents?	
Yes	34.6
No	65.4
What was the major cause of the accidents? (n = 116)	
Carelessness	31.0
Lack of safety measures	22.5
Stress due to excessive overtime	15.5
Lack of experience	10.1
Lack of maintenance of the equipment	7.8
Inadequate tools	5.4
Lack of respect of safety measures	4.7
Low experience of site manager	1.6
Use of equipment beyond its capacity	0.8
Other reason	0.8
In your opinion, what is the most frequent factor that may affect workers' safety?	
Risk perceptions of workers and contractors	16.1
Experience of both contractors and workers	14.1
Educational level of workers and contractors	9.5
Attitudes and behaviour of workers and contractors	8.0
Monitoring and evaluation by regulatory authority	4.9
Effectiveness of government rules and regulations	3.4
Legislation and policy framework	2.6
Safety measures and procedures	1.7
Relationships between workers	0.9

accident. Only 14.3% reported suffering from a work-related disease. The incidence of construction-related diseases in Palestine was reported by our workers as fairly low. This may be due

to the simple type and typically small size of projects compared with other countries.

The greatest influence on safety according to workers' perceptions

was the foreman. This role generally requires a greater degree of experience and higher level of education than for other workers. The foreman has the most frequent contact with workers at the construction site, assigning tasks and monitoring performance, and is the person specifying the ways in which the work is to be performed and skilled enough to identify unsafe situations.

Accidents may be a result of technical and/or managerial failing. Workers reported that the main causes of accidents were carelessness by workers, absence of safety measures and stress due to excessive overtime work. However, weak implementation of the government safety laws could be the root cause as this enables violations (e.g. not securing safety tools and forcing excessive overtime) to occur without punishment. Similarly, contracting agencies avoid detailing occupation health and safety restrictions, leaving the contractor without benchmarks and therefore no penalties in case these safety standards are not reached. The lack of appropriate training and education was another perceived cause of accidents according to workers. Other studies showed that accidents in the construction industry occur due to 3 root causes: failure to identify unsafe conditions before the activity, decision to proceed despite the identification of unsafe conditions and decision to work regardless the conditions of the work environment [8,21]. Some of our workers identified inadequate tools and a very few suggested use of equipment beyond its capacity as causes of accidents.

Only 10.7% of respondents knew that there was a first-aid worker at their place of employment and 23.5% did not know. Of this latter group, they may or may not have been provided with a first-aid specialist, but the fact they were not aware of their presence indicates knowledge regarding safety is low.

Table 3 Construction workers' views on which role/position in the construction industry had the most impact on the workplace safety by type of job

Job title	Total responses	Role/position with most impact on workplace safety					
		Safety officer	Foreman	Project manager	Regulatory authority ^a	Site engineer	Other
	No.	%	%	%	%	%	%
Building technician	70	18.6	44.3	7.1	7.1	18.6	4.3
Steel technician	38	31.6	50.0	13.2	5.3	0.0	0.0
Plasterer	31	19.4	38.7	16.1	9.7	16.1	0.0
Tiler	18	5.6	50.0	5.6	5.6	33.3	0.0
Pointing technician	14	14.3	57.1	0.0	14.3	14.3	0.0
Painter	17	41.2	29.4	11.8	5.9	11.8	0.0
Unskilled labourer	107	11.2	51.4	15.9	8.4	13.1	0.0
Electrician	12	16.7	41.7	16.7	8.3	16.7	0.0
Sanitary ware technician	14	21.4	57.1	7.1	7.1	7.1	0.0
Other	27	14.8	51.9	14.8	18.5	0.0	0.0
Total	348	17.8	47.7	12.1	8.6	12.9	0.9

^aMinistry of Labour.

Safety training and education were believed by our workers to be the elements with the greatest impact on construction site safety. This agrees with Dingsdag et al., who found that occupation health and safety training and education is the most important element for safe performance [22]. Communication with the workers was identified by our sample as the second key element essential to improving worksite safety. Good communication enables

effective feedback about the safety of the workplace and workers' concerns, which can contribute to improved safety situations.

Conclusion

In general, the current level of safety on construction sites was perceived as low by workers and the lack of enforcement of safety rules was believed to be the root cause of this.

Site management and experienced human resources such as foremen and safety officers were perceived as having the greatest influence on site safety. In general, our results suggest that the MoL is not paying enough attention to the safety of workers in the construction industry, enabling the labour law violations indicated by workers themselves. Further efforts are required to implement the safety legislations in the Occupied Palestinian Territory.

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Safety 2012

Safety 2012 is the 11th World Conference on Injury Prevention and Safety Promotion and is being held from 1 to 4 October 2012 in Wellington, New Zealand. The conference is held biennially under the auspices of the World Health Organization. It brings together the world's leading injury prevention and safety researchers, practitioners and advocates, to build our knowledge and strengthen the fields of injury prevention and safety promotion worldwide.

The overall theme of Safety 2012 is *Connecting pathways for a vibrant and safer future*. Within this context, specific themes being addressed at the conference are: i) Safety, design and sustainability – adopting a “sustainable environmental” approach to injury prevention; ii) Evidence for effective practice and programmes – promoting the evidence for injury prevention and control “solutions/interventions” that work; iii) Translating research and policy – the “implications/impacts” of research and policy on promoting injury prevention

Further information about the conference is available at: <http://www.conference.co.nz/worldsafety2012/home>