IMPROVING HEALTH AND SAFETY ON CONSTRUCTION IN ROMANIA. A COMPARISON WITH IRELAND; LESSONS TO BE LEARNED

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Abstract

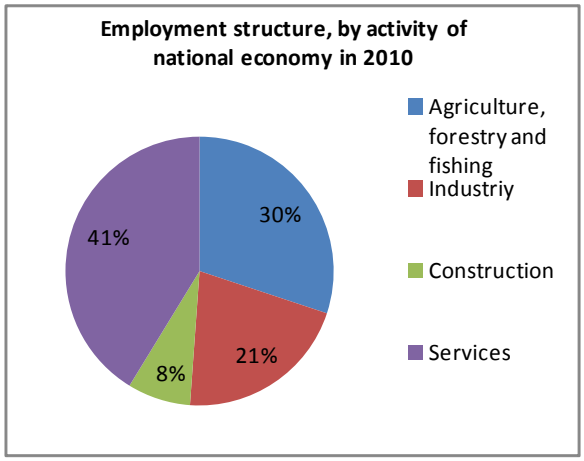
The purpose of health and safety procedures in the construction industry is to ensure the health, safety and wellbeing of workers. Due to high accident rates on construction sites internationally, health and safety legislation has focused on minimizing accident causation and promoting construction worker's safety. However, little attempts has been made to research the effects of those health and safety interventions on the safety behavior on construction sites in Romania. Therefore, the objective of this research was to explore the health and safety improvements on construction sites in Ireland and compare these with the current state-of-play of the construction sector in Romania. Based on the findings in Ireland, an opportunity exists to improve Health and Safety performance on construction sites in Romania. The main findings demonstrate that the safety can be improved through the introduction of safe working systems, enhanced regulation and enforcement, the role of the management and increased staff awareness and training.

Keywords: *health and safety, procedures, construction workers, safety performance, Romania*

JEL Classification: I15, J81, J28

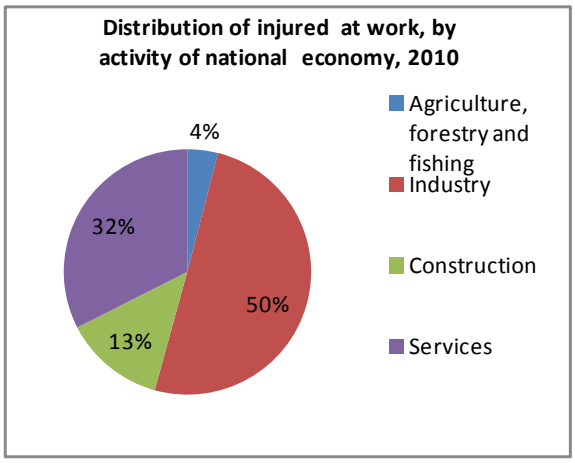
Introduction

Improving health and safety on construction sites in Romania is of importance from a human as well as an economical standpoint to ensure success and sustainability of the organizations in the sector. Official figures indicate that 705,000 people worked in the construction industry in Romania in 2010, representing 8% of the total employment in Romania (Romanian Statistical Yearbook, 2011), as outlined in **Graph 1**.



Source: Romanian Statistical Yearbook, 2011
Graph 1

The construction industry in Romania reflects a high risk sector. Total number of injured people at work was 4,040 in Romania in 2010, of which 535 persons in construction. In addition, nearly 12 per 100,000 workers in the construction sector were the victim of fatal accidents. This compares to a national average of 3.6 to 100,000 workers across all sectors. Distribution of injured people at work by main activity of national economy is illustrated in the **Graph 2**.



Source: Romanian Statistical Yearbook, 2011
Graph 2

Table 1

Rate of accident at work on sections/divisions of activity of national economy ‰ 2010	
Mining and quarrying	3,57
Construction	1,82
Real estate	1,33
Administrative and support service activities	1,32
Water supply; sewerage, waste management and decontamination activities	1,27
Transport and storage	1,18
Manufacturing	1,1
Repair and installation of machinery and equipment	1,06
Electric and thermal energy, gas and water production and supply	0,94
Total	0,88

Source: Romanian Statistical Yearbook, 2011

Table 1 above illustrates the statistics and hierarchy regarding the rates of accidents at work per sector. The figures demonstrate that they are above the rate of accidents for the total economy. The statistics were calculated on accident frequency or number of injured persons per 1,000 employees. It is noted that the rate for "Construction", with an accident rate of 1,82‰**,** is almost at the head of the hierarchy, only being surpassed by the sector "Mining and quarrying" hovering well above the rate of accidents for the total economy.

Many studies demonstrate that the majority of accidents and resulting injuries in the construction industry are attributed to unsafe work practices of the construction workers rather than unsafe working conditions (Garavan and O'Brien, 2001). This could suggest that the construction sector in Romania could benefit from increased regulations, policies and procedures to increase the safety of construction workers.

The objective of this research was to explore the health and safety improvements on construction sites in Ireland and compare these with the current state-of-play of the construction sector in Romania. Ireland was specifically selected as a benchmark since it is widely accepted that the Health and Safety procedure in Ireland have been progressive and successful in reducing the accident rates on construction sites. Based on the findings in Ireland, an opportunity exists to accelerate improvements in the health and safety performance on construction sites in Romania. 'Hindsight is a wonderful thing' – and the lessons learnt in Ireland provide a unique opportunity to fast track health and safety improvements in the construction industry in Romania.

The main findings demonstrate that the safety can be improved through the introduction of safe working systems, enhanced regulation and enforcement, the role of the management and increased staff awareness and training.

Key influencing factors

A systematic review of the literature from journal articles and conference proceedings identified four major prevailing factors that influence the health and safety procedures and practices on construction sites.

Nature of work and complexity

Construction safety related accidents are influenced by the unique and complex nature of its activities (Behm, 2005). Safety in construction is considered complex due to the industry's unique work hazards, rapidly changing conditions and the characteristics of construction organizations (Choudhry and Fang, 2008). Furthermore, construction sites are changeable in nature, constantly changing in status, covering a huge range of construction processes of varying complexity and scale (HSE, 2009). The work processes and people change almost daily on sites and construction sites undergo frequent changes in topography, topology and work conditions throughout the duration of the projects (Rozenfeld, 2008). Construction projects are characterized by many unique factors, such as frequent work team rotations, exposure to various weather conditions, high proportions of unskilled and temporary workers.

Work pressures: time and budget

The construction industry is under constant pressure to reduce costs and at the same time improve quality. This is particularly challenging with rising costs in labor and materials, and in building increasingly complex structures. It is suggested that higher frequencies of construction accidents are registered on projects that were subject to significant budgetary pressures and those that were competitively bid (Hinze, 1998). Research of the Australian construction industry by Holmes, Lingard, Yesilyurt, and De Munk (1999) found that the construction related hazards were largely attributed to the nature of the work, poor individual work practices, ignorance, and work pressure due to budgetary and time constraints.

In an article titled "Pace is the New Peril" Berzon (2008) examined how the accelerated scheduling of construction work was one of the contributing factors to safety problems and accidents. Berzon (2008) identified the underlying problem to be the sacrifice of safety in a rush to finish the job and whereby productiveness is placed before safety.

Safety perception

Behavior among construction workers in particular may be guided by some principles whereby the benefits of unsafe behavior often appear to outweigh those of safe behavior (Zohar & Luria, 2003). Some researchers go even further and argue that safe behavior most often results in non-events, while unsafe behavior appears in most cases to lead to tangible benefits. Baarts (2003) cited that the construction industry is characterized by traditional masculine values such as freedom, independence, resourcefulness, and toughness, with an often informal culture, in which safety knowledge is not openly expressed. This results in safe behavior being inhibited at construction sites whereby project performance goals are often prioritized over safety goals.

Health and safety procedures

In accordance with current legislation, standard policies and procedures for mitigating the risk of accidents rely on increasing workers' safety awareness, through incentives, training, hiring, feedback communication and participation. At the same time a number of coordination and prevention policies, such as erecting temporary protections, guardrails or safety nets, wearing personal protective equipment and planning the coordination of tasks, have to be implemented (Behm, 2008). However, most construction companies consider the hazard identification and evaluation as part of their health and safety procedures, as a burdensome requirement that they must fulfill in order to avoid government fines. As a result, they often neglect the proper implementation of these plans (Saurin, Formoso, & Cambraia, 2008).

Research goals and methodology

The objective of this research was to explore the health and safety improvements on construction sites in Ireland and compare these with the current state-of-play of the construction sector in Romania. Ireland was selected as a benchmark since it is widely accepted that the improvement in health and safety procedure in Ireland have resulted in a reduction of the accident rates on construction sites.

The focus of a recent study in Ireland was to identify any changes in the health and safety procedures and practices on construction sites over the past five years from the construction workers' perspective. The findings in Ireland provide a unique opportunity to implement immediate improvements and accelerate health and safety performance in the construction industry in Romania.

A grounded theory was adopted to identify emerging themes during the data analysis. Related particular pieces of conversation were identified and the common elements were placed under a separate theme. A mixed methodology was adopted for this research. Furthermore it is possible to compare and contrast findings and expand on the knowledge experienced over time. The data for this research was qualitative initially and converted into quantitative form in order to carry out a statistical analysis for the purpose of indentifying themes and trends

This research involved face to face interviews of fifty one construction site personnel with management responsibilities, working for a minimum of five years in the Irish construction industry. The authors performed semi-structured interviews. A total of 51 interviewees were identified for the study. The participants were all in current employment in the construction industry and also studying part-time at third level. The participants were chosen for participation on the basis of the following criteria:

- Currently working in the Irish Construction Industry
- Worked in the Irish Construction Industry for a minimum of 5 years
- Compulsory for candidates to have some element of their work being site based.

The interviewees were from the construction industry and mainly based in the Dublin metropolis. They included site engineer's managers, quantity surveyors and

health and safety practitioners. The majority of the cohort was in the 25-35 age group and over 90 % were male. Their company size included very small (1-10 employees), small (11-49 employees), medium (50-250 employees) and large (250+ employees) companies. SME's regarded the above categories as reflective of the economic demographics of Ireland.

Limitations

The primary objective of this present study was to identify any changes in the health and safety procedures and practices on construction sites over the past five years from the construction workers' perspective. Although the statistics used in this study do not represent the attitudes or opinions of all those within the industry, they express the grounds for this study which have arisen from attitudes of those involved in the industry towards health and safety.

A grounded theory was adopted (Corbin, 1990) in order to identify emerging themes during the data analysis. Related particular pieces of conversation were identified and the common elements were placed under a separate theme. It is important to mention that different factors were not expressed equally by all respondents. The interview questionnaire had been developed from a pilot interview and comprised 10 questions that would help understand the operative's experiences over the last five years. The approach used by Mullen (2004) in designing the questionnaire framework allowed respondents to tell their own story in their own way and style.

This research had been conducted in Ireland and the cohort is all in part-time third-level education, along with the interviews having specific focus on the Irish construction industry. The weights and attributes may be strongly influenced by the local environment and culture.

Data analysis and results

According to the literature review, little attempt has been made to research whether health and safety procedures have changed on construction sites over the last five years. This may be surprising, in particular in the context of the relative high accident rates on construction sites globally and the emphasis on strong health and safety regulation and legislation internationally aimed at minimizing accident causation and promoting construction worker's safety. The findings from an Irish perspective are outlined in the following paragraphs.

Health and Safety procedures

Risk Assessment procedures were in place five years ago for 59% of companies. 82% of the respondents indicated that their companies have changed the Risk Assessment procedures in the last five years. The majority (58%) of the participants believe there has been no relaxation in the current Health and Safety procedures.

Method Statement procedures were in place five years ago for 49% of companies. 64% of the participants' companies have changed their procedures in

the last five years. 29% of participants believed Health and Safety is now stricter applied on construction sites. 29% believe there is greater awareness in relation to Health and Safety procedures in the last five years. The research shows that 66% of the participants experienced Safe Working Systems within their organizations. 53% of interviewed construction workers' companies changed their Systems in the last five years. 41% of the interviewees experienced more focus on Safe Working Systems within their organizations in the last five years.

Work pressures

A large majority (86%) of the interviewed participants experienced a change in external pressures in the last five years. 77% of participants experienced pressures from within their own organizations. The source of the pressure for 75% of participants was believed to be driven by Cost ('Time is Money!'). Over half (59%) of participants also experienced a change in external pressures. 45% of participants state that Health and Safety is more of a concern today than it was five years ago.

Health and Safety inspections

From the interviewees, 57% did not believe they would receive an inspection on-site five years ago. The majority, 83% of participants, now believe they could receive a HSA inspection in the current climate. The research showed that a majority (69%) of participants state that the belief of a real unannounced HSA inspection to site would change their attitudes towards safety behavior on site.

High Risk activities

Over half (66%) of interviewees stated that there has been a change in High Risk activities on site, compared with five years ago. Nearly all of those respondents (63%) indicated to have experienced improvements in Health and Safety in relation to High Risk activities and the majority (69%) believed those changes to be positive. The large majority (75%) of participants outlined to have noticed the change in procedures on site around the year 2007.

The majority (79%) of respondents stated that they experienced a change in attitudes to High Risk activities. 69% of participants believe now that the general operative has greater awareness in hazards involved with High Risk activities. 82% believed that the change in attitudes was a positive change. Over half (59%) of participants believe now that operatives are less inclined to put themselves at risk.

Discussion and lessons to be learnt

The results from this study explored the operative's perspective on health and safety procedures and practices on construction sites in Ireland and can form a contribution to further policy making, in particular relating to health and safety procedures and practices. The specific findings in Ireland offer an opportunity to improve health and safety performance on construction sites in Romania.

Documentation and Safe Working Systems

Procedures and rules form the core component of Safety Management systems (Mohamed, 2002). The key contributing factors to the high incidences of construction related accidents, as identified by Haslam et al. (2005), were linked to deficiencies in risk management procedures. The present study showed that 53% of the participants indicated that their companies had changed and modified the Safe Working Systems over the last five years. Three themes emerged from the research data as driving factors for these changes in Safe Working Systems: stricter enforcement, external influences and cost pressures.

This research also identified that 55% of companies experienced more procedures, more documentation and more training relating to health and safety on construction sites over the last five years. The results indicated that 49% of the construction worker's companies did have Method Statement procedures in place five years ago, yet the size of the construction site and nature of the construction project work were a key factor that influenced whether the procedures were in place. The results are largely in line with the findings of Helander (1991), whom found that many of the safety practices are specific to the different job classifications.

Construction workers' attitude towards safety is mainly influenced by their perception of risk, management, safety rules and procedures (Coble and Haupt, 1999). In this research, 41% of participants perceived a stronger focus on Safe Working Systems within their organizations in comparison to five years ago. The research indicated that, in particular, operatives on larger sites carried out Method Statement procedures, while operatives on smaller construction sites carried out such procedures to a lesser extent. When the research results are put in the context of Helander's (1991) findings that construction workers typically underestimate the particular hazards in their work, they can provide new insights on how the motivation for adopting safe working procedures can be positively influenced.

Regulation and enforcement

Many assume that after drafting the regulations, compliance will automatically follow (Amodu, 2008). However, socio-legal researchers indicate that compliance is not a logical consequence of regulatory efforts and achieving better compliance is a difficult task. Even in highly standardized work tasks it is impossible to rigidly follow procedures, since circumstances even in such work vary substantially and a large number of ad hoc adjustments must be made. For example, the findings of this research demonstrate that five years ago (what could be considered the height of the construction boom in Ireland) nearly half of the respondents (47%) stated that there were no procedures in place for carrying out Method Statements, even though this is and was a legal requirement across the industry.

Size of firm

A significant finding in this research was that the majority of all the participants, particularly those in larger companies, affirmed that no relaxation of Health and Safety procedures was visible. Nearly half the participants believed Health and Safety regulations will be enforced more strictly during a recession, with larger firms experiencing the highest levels of stricter enforcement. Good Health and Safety practices are considered a strong requirement for good public relations in order to obtaining the next job; this is a widely accepted concept amongst the participants of this study.

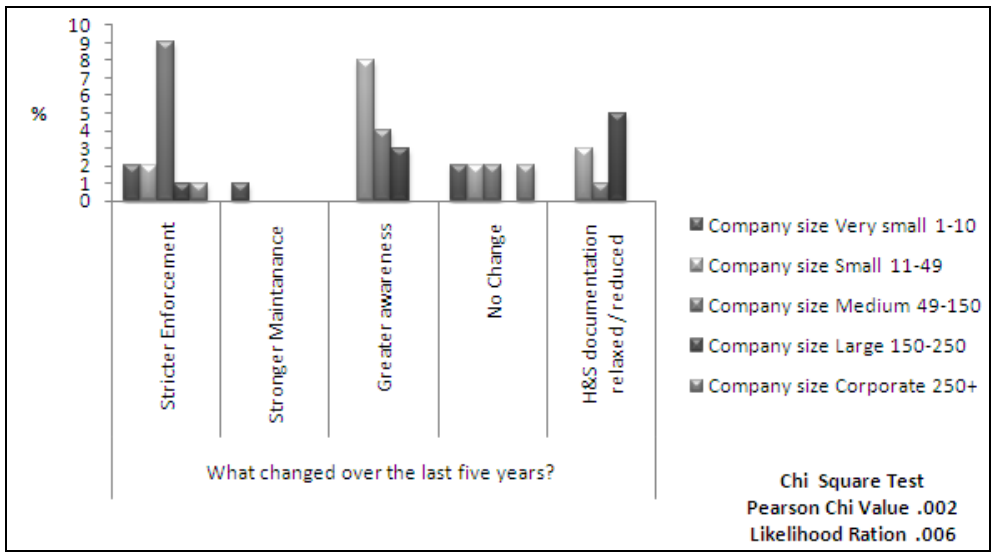


Figure 1. *Changes – Size of Firm*

As can be seen in Figure 1 above, a small percentage of the participants in this study experienced no change in health and safety procedures compared to five years ago. The participants appear to work mainly with very small and small organizations. This may warrant the question whether Health and Safety procedures and practices were in place five years ago (and still are in place) or whether Health and Safety procedures and practices were perhaps never in place for very small and small organizations.

The research shows that Health and Safety procedures and practices changed and the size of the site was a determining factor. The larger firms appear to strengthening and implement their procedures stricter, while smaller companies tried to avoid the strict implementation of health and safety procedures or keep them to a minimum on smaller sites. A significant finding was that Health and Safety danger were ignored by operatives within smaller/medium organizations. This data validates the findings of Hay (2003) that sites with small numbers of workers have a greater likelihood of serious accidents occurring.

Cost pressures and cost of paperwork

Most construction companies consider the hazard identification and evaluation as part of their health and safety plans, as a burdensome requirement that they must fulfill in order to avoid government fines. Within the findings of this research there are strong indicators to support this statement. Increased costs were cited as the reason for change relating to Risk Assessment procedures over the last five years. The increased costs included the cost of accidents but also the cost of maintaining health and safety systems within an organization. Over 54% believed there is now a significant increase in paperwork relating to Health and Safety procedures.

An interesting perspective was presented by one of the respondents regarding the increased costs for the administration of Health and Safety procedures. The example presented by the participant suggested that the cost element for tendering of potential work should require separate pricing for Health and Safety procedures. Working at height in particular requires pricing for different elements depending upon the work being carried out, such as scaffolding, PPE and harness equipment, which can be costly elements.

Furthermore, the Safety, Health and Welfare at Work Act (2005) requires that employers must release employees for relevant Health and Safety training without a penalty (HSA, 2006). The costs and the resource burden relating to this legal Health and Safety requirement have to be carried by the construction organizations. This corroborates a recurring theme that the implementation of health and safety procedures contributes to an increase in a company's cost base. The Health and Safety related costs include: Safe pass, Construction Skills Certification courses and Basic Scaffolding. Also, renewal costs are to be taken into account and occur at five-year intervals. Other costs associated with both CSCS and Safe-pass would include the cost of releasing employees to attend the training days. In addition, there are significant legal requirements for construction companies to maintain and continuously update all the required Health and Safety documentation.

Work pressures

The findings of this research support previous studies as the participants did indeed experience significant external pressures on site to have increased over the last five years. The common pressure to construction related work is the financial pressure, with most of those interviewed stating that "Time is Money!" This is largely in line with findings by Holmes, Lingard, Yesilyurt and De Munk (1999), that risk on a construction site is largely attributed to budgetary and time constraints

The single most important dimension of safety culture in a construction environment is the role of the managers, through their potentially positive attitudes in reducing the number of unsafe acts by employees and in turn reducing accident rates. The fundamental role and behavior of the manager positively influences employees' involvement and active participation in safety activities (Fernández-Muñiz, 2007).

The majority of those interviewed confirmed to experience work pressures from within their own organizations and nearly all of those experienced increased pressures from their direct line manager. Another significant finding was that five years on, in what can be considered a recession, 34% of the participants stated that time pressures were the predominant concern.

High Risk activities – working at a height

A study by Gillen (1997) among construction workers who had sustained non-fatal falls, explored their perceptions of the safety climate of the worksite where they were injured, and their perceptions of job demands, decision latitude, and co-worker support as possible contributing factors to the severity of their injuries. Also Helander (1991) stated that many of the safety hazards are specific to the different job classifications and found that construction workers typically underestimate the particular hazards in their work.

In the present study 66% of participants' state that they were involved in High Risk activities on construction sites over the past five years. Only a small percentage experienced deterioration over the last five years in High Risk activities. In contrast, the majority of the participants in this research believed there are significant improvements in Health and Safety procedures and practices for High Risk activities on site.

Awareness, training, attitudes

A large number of factors determine the employees' attitudes and behaviors with respect to risk, compliance and an organization's safety culture, such as visible commitment to safety by management, workforce participation and ownership of safety problems and solutions, trust between management and employees, good communications and a competent workforce (Fernández-Muñiz et all, 2007).

The findings of this research identified that the majority of the operatives are less inclined to put themselves at risk, in particular in relation to High Risk activities. This result adds merit to the belief that the general operative has a greater awareness of health and safety risks on construction sites. The positive change in the awareness of health and safety risks and changes in attitudes relating to High Risk activities on construction sites may suggest that individual safety behavior has improved compared to five years ago.

Organization's perceptions of legal risk play a far more important role in the organizations behavior than the objective likelihood of legal sanctions (Shapiro, 1999). A majority of construction workers in the present research reported that hearing about legal sanctions against other firms had prompted them to review, and often to take further action to strengthen, their own firm's preventative program.

Conclusion and future research

The main findings of this study demonstrated that especially the company size predicted site safety behavior (procedures and practices) on construction sites. Most noticeably, the large organizations demonstrated higher levels of compliance to safety procedures and practices on construction sites. Large companies consider good Health and Safety practices a strong requirement for public relations and to obtaining the next job; the medium sized organizations showed signs of regression relating to their efforts to continue to comply with health and safety procedures and practices. Cost was suggested as the main factor and as a result the health and safety related aspects of the business are impacted by ongoing cost pressures. Small organizations reported a low level of compliance to safety procedures and practices on construction sites compared to five years ago. For small companies the cost relating to compliance remains relatively high and the probability of health and safety inspections is perceived low.

Based on the results of this study in the Irish construction industry, the health and safety regulation and enforcement may need to be more tailored to support small and medium sized companies with the implementation of their health and safety procedures.

For health and safety in construction, we highly recommend the development of similar research in Romania that will underpin the improvement of health and safety procedures in Romania. Measures taken in Ireland may be a reference model to support companies in the implementation of their health and safety procedure thus reducing the rate of accidents on construction sites.

The limited available data emphasizes the need to further explore the changes relating to health and safety procedures and practices in the construction industry. In the context of the strong increase in health and safety legislation and regulation in construction sites internationally and the recent globally economic slowdown it is eminent to achieve a better understanding of the changes relating to health and safety procedures and practices in the construction industry.

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