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IMPROVING SAFETY AT WORK FOR LOW-SKILLED AND HIGH-RISK WORK.

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ABSTRACT

Employees with a low level of education are faced with unsafe working conditions more often than their better educated counterparts. At the same time the lower end of the labour market is evolving rapidly, with workers from new EU member states increasingly being taken on to do low-skilled and generally risky work. Existing approaches to stimulate behavioural change and safe behaviour on the work floor fail to devote explicit attention to the considerable diversity of this group of low-skilled employees, and their different perceptions of work and safety in terms of age, language, culture, religion, gender, and also health status.

The aim of the study was to ascertain whether safety interventions can be better geared to the work floor. This will be achieved by appreciating the scale of the problem and by understanding the experiences of this particular group and their perceptions of work and risk.

A large dataset representative of the working population in the Netherlands was analysed to establish the problem of safety among low-skilled employees. In addition, an exploratory study into current practices on the work floor was conducted, mainly as part of participative safety programmes, that were aimed at the prevention of unsafe conditions in low-skilled work. The following sectors were represented: construction, transport, agriculture (greenhouse horticulture) and the cleaning industry.

Knowledge of diverse disciplines, such as safety sciences, human resource policy, social innovation, occupational psychology and health promotion was accumulated to develop a theoretical framework of do's and don'ts for interventions.

Key aspects of the framework for low-skilled and high-risk work are awareness of risks, motivation, knowledge and skills, control options (actual task opportunities in the working environment) and assurance (lasting change). Parties that exert an influence were also determined. In addition to the low skilled employees themselves, the influencing parties are the peer group, (immediate) management and the organization or branch.

1. INTRODUCTION

The composition of the labour market is changing as a result of trends in society such as globalization, demographic developments, the opening of borders and increasing work flexibilization. The lower end of the labour market in particular is evolving rapidly, with workers from new EU member states increasingly being taken on to do low-skilled and usually risky work. This includes work that involves exposure to dangerous levels of radiation and hazardous substances, and working with machinery, working at height, and also aggression on the work floor. This risky work is often performed by vulnerable people such as low-skilled employees, older employees without proper qualifications, dropouts, ethnic or migrant workers etc.

In 2007, the Netherlands Centre for Occupational Diseases (*Nederlands Centrum voor Beroepsziekten*) indicated that employees at the lower end of the labour market contract an occupational disease relatively often (NCvB, 2007). Employees with a low level of education are also far more likely to be involved in industrial accidents than employees who are more highly educated (Venema & Bloemhoff, 2006). The reason for this is the generally poor working conditions including repeated exposure to hazardous substances. Moreover, interventions and campaigns aimed at unskilled employees are not reaching their intended target groups, probably because of the way the groups are approached.

The project addressed the following research question: how can safety interventions be better geared to the work floor, and in particular to those groups of unskilled and vulnerable employees working in dangerous, dirty or physically demanding circumstances? Existing approaches to promote behavioural change and safe behaviour at work floor level fail to devote explicit attention to the wide diversity of people, and their different perceptions of work and safety, in terms of age, language, culture, religion, gender, and also health status.

Therefore what is needed is a better understanding of the experiences and perceptions of this group. Knowledge of diverse disciplines, such as safety sciences, human resource policy, social innovation, occupational psychology and health promotion was used. The following industries were represented: construction, transport, manufacturing, agriculture (greenhouse horticulture) and cleaning services.

This research assessed existing, mainly participative, safety programmes in order to formulate a framework with do's and don'ts when adjusting these programmes to meet the specific needs of the target group.

2. THE TARGET GROUP

The target group for this research comprises unskilled employees often involved in hazardous, dirty and physically demanding work, who are, above all, vulnerable, particularly in terms of job security.

They often have flexible contracts and experience stiff competition from low-wage countries or other temporary workers. Moreover, their career prospects are limited, and they are confronted with a deterioration in their social security situation.

Most of these employees have low levels of education and poor literacy skills. Some of them are migrants who are very often on flexible contracts, and subject to discrimination on the labour market.

This research focused on people with lower levels of education, because this particular group have specific requirements if interventions are to be effective. Vulnerability is linked in part to the level of education and also to employment opportunities: the position of unskilled people on the labour market tends to be weak. This means it is even more difficult to turn down work where the working conditions are poor.

This puts these workers in a vulnerable position on two counts. Firstly, they are often the victims of industrial accidents (Storrie, 2002), due in part to the nature of the work employees on temporary contracts are required to do, and partly because of a lack of information (Dutch Labour Inspectorate, 2004) and experience (Fabiano et al, 2006). The risk of having an industrial accident is highest in the first four months of employment (Davies & Jones, 2005). Secondly, employees with contingent work will be less keen to complain about difficult

working conditions fearing that their contract will not be renewed. This stands in the way of there being any improvements to poor working conditions. Employees with little chance of promotion (to a position with better working conditions perhaps elsewhere) are, therefore, extremely vulnerable. This applies even more to older employees with lower levels of education.

In addition to the groups mentioned above, there is another group that can be considered to be particularly vulnerable: that of non-Dutch speaking or migrant workers. Migrants (specifically those who only recently arrived in the country) tend to have language problems resulting in their being less able to understand verbal information on safety or health issues. They will also be less sensitive to certain aspects of the dominant Dutch business culture (Statistics Netherlands, 2007), which could lead to feelings of alienation within such a culture, also in terms of occupational safety. Migrants also experience problems on the labour market, even if their level of education is adequate. Again, these conditions make it difficult to leave a hazardous working environment for a better one.

From a company point of view, it is becoming increasingly more difficult to pursue a tailor-made safety policy simply because the workforce is diverse. 'Differences in thought and value systems in particular have increased substantially as a result of the influx of people with a non-western cultural background. This makes it more difficult for an organization to work with fixed patterns. There is also a need for other skills to deal with constantly changing situations and vastly different people. We need a broader repertoire in dealing with this and with more employees who are able to handle a world that they only partly understand' (Hoffman, 2002).

2.1 Establishing the problem

In order to establish the importance of the problem, an analysis was conducted of the results of the Netherlands Working Conditions Survey (NEA) in 2005 and 2006 (Van den Bossche et al, 2006). The NEA is the largest annual survey of working conditions in the Netherlands, and involves some 25,000 employees. TNO conducts the NEA in association with Statistics Netherlands (CBS).

The analysis was performed on an aggregated dataset from 2005 and 2006, consisting of 47,508 employees in total, and the data are representative of the working population in the Netherlands. It highlighted that (see table 1a,b,c) :

- Of the **total group** of the working population, 27% is educated at a low level; in this group 17% are migrants.
- 46% of **unskilled workers** are exposed to hazardous substances on an almost daily basis, especially non-western workers, as opposed to 30% of the better educated.
- **Non-western migrants** are significantly more involved in an accident with physical or mental injury (10%). Dutch citizens have more access to personal protective equipment.
- People working for **temporary employment agencie**s were affected significantly more by mental or physical injury as the result of an accident (9.6%).

Fewer measures were taken among the vulnerable groups mentioned, whereas there is, in fact, more need for measures to be taken.

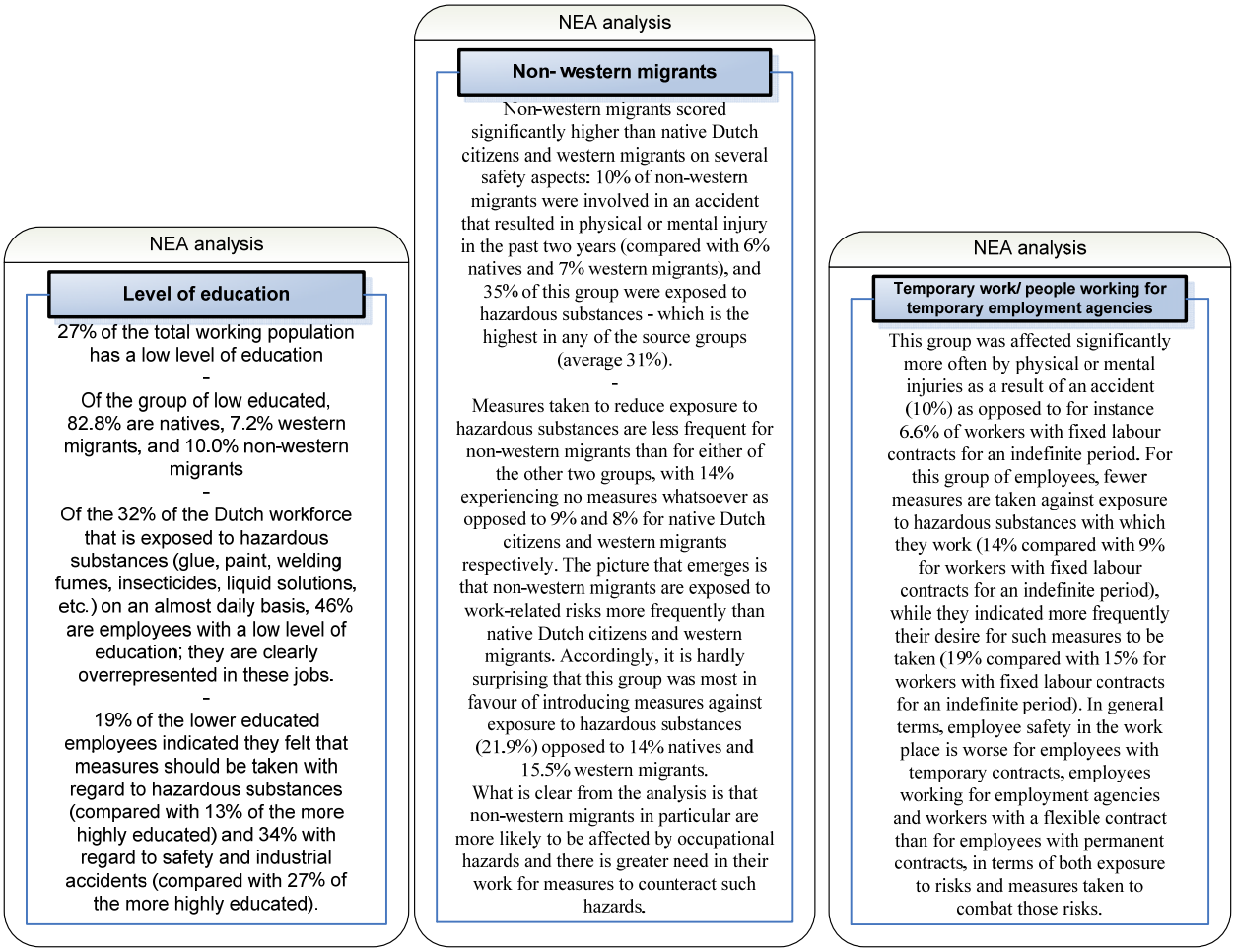

Table 1a: NEA analysis **Table 1b: NEA analysis** **Table 1c: NEA analysis**

The above results emphasize that employees with lower education levels in various sectors are exposed to danger in the work place more frequently. Western migrants, non-western migrants and employees working for temporary employment agencies are disproportionately affected. These groups indicate a desire to see measures implemented when working with hazardous substances in terms of safety and the prevention of industrial accidents.

The figures show that the scale of this problem is cause for concern and reinforces the need for new approaches for interventions that pay special attention to the safety issues of unskilled employees.

3. METHOD

The approach of this research project is bottom-up: the focus is on social interaction on the work floor. Attention is given to employee interaction within or between teams, and to relationships outside work (peers) and relationships between employees and their immediate supervisors. The company's characteristics are the preconditions.

The research design was as follows:

Phase 1. A literature study and interviews with experts/representatives in the field.

Literature from diverse disciplines, such as safety sciences, HR policy, social innovation and health promotion was used to cover the variety of aspects related to working at the lower end of the labour market. Keyword combinations for the literature search were: safety + low-skilled work, precarious work, improving+ safety lower education, workfloor + safety. News articles, (web) pamphlets, films, documentaries and magazines were also used to refine the most important aspects. The search led to an initial design of a theoretical framework of key aspects.

Partly overlapping in time, interviews were held to explore and validate the key aspects in practice. The following experts and representatives were interviewed: representatives from two employee organizations in the construction sector; a union representative; a representative from a reintegration company; a representative from an employee/employer organization in industrial cleaning; a column writer; an expert on the behaviour of young male adolescents; the manager of a temporary employment agency; two experts on intercultural differences; two experts on the reintegration of dropouts; an expert in participative interventions (gaming), and an expert on visually-based tools.

Experts and representatives were approached in sectors with a high incidence of accidents (Venema & Bloemhoff, 2007). These are: construction, transport, agriculture (greenhouse horticulture) and the cleaning sector.

The questions were: Do you recognize the problem as stated? Do you recognize the target group? What are the characteristics of the target group? What critical aspects should be considered when approaching the target group on safety issues? We also asked for contact people in companies in the selected sectors. Our preliminary findings were presented and discussed in a workshop with stakeholders from the industries represented.

The results were used to develop a draft theoretical framework with key aspects for interventions to approach the target group and a shortlist of do's and don'ts, as a first step for the final framework as presented in section 5.

Phase 2. Company research: investigation into the perception of safety among employees on the work floor by analysing current practice.

In the second phase an exploratory study was conducted of current practice to identify and prevent unsafe conditions in low-skilled work. The research assessed the efficacy and effectiveness of existing, mainly participative, safety programmes. We were particularly interested in attempts to align these programmes to the specific needs of the target group: the lower end of the labour market.

A key aspect of this research is the bottom-up approach. Participation of the employees involved on the work floor – especially in setting up the programme – will help ensure that their interests are met (Willemsen et al. 1998). In terms of methodology, the *perception* of risk is also something that can and should be identified by close collaboration of the target group in the research. The target group approach is described in detail in a research protocol. Relevant information concerning risks (risk assessment), and ongoing safety initiatives in the company or the sector was consulted in advance.

We carried out 6 company visits, during which we interviewed our contact person (manager or safety manager) and at least two employees from the work floor. We also observed what went on on the work floor in order to understand the working environment. The companies involved were:

- a company in greenhouse agriculture;
- a reintegration company;
- a construction company;
- two industrial cleaning companies;
- a baggage handling company.

All the employees interviewed on the work floor were young men.

Under the protocol, the contact person, usually a manager or a safety expert, was interviewed first. Items covered were, for example, the percentage of low-skilled workers in the company, a description of the target group, relevant subcultures/subunits and their characteristics, current initiatives to promote safe behaviour, and success factors and barriers in promoting safety among the target group.

Interviews were then held with the target group on the work floor. There was significant opportunity for their input, e.g. the subjects covered related to the various aspects of their perception.

The following 5 key questions serve as guidelines for interviews with the target group:
- What do you think is important about your work and what role does safety play? Do you think it is important to work safely, and if so, why? If not, why not?
- Do you have the feeling that safe working practices are important in your company, and if so, why? If not, why not?
- How do you ensure that you work safely?
- How does the company ensure that you can work safely?

- How would you prefer to be addressed on safety issues?
We asked the following questions to obtain a number of concrete examples: tell us about a situation in which you were in two minds about whether to take either a quick or a safe approach, and indicate the reason for choosing one approach or the other.

Examples of current practices mentioned were: toolboxes, behavioural safety programmes, procedures, warning signs that varied in their effectiveness to reach the target group. Practices such as toolboxes based on written text were not perceived as effective, and neither was one way management communication.

The result of this phase was a refinement of the key factors in the theoretical framework. Do's and don'ts are identified per key factor which can be regarded as a Programme of Requirements for interventions for our target group. The theoretical framework can be used as tool for the design of interventions.

Phase 3. Developing interventions in association with companies.

New interventions will be developed and introduced in association with several companies on the basis of the requirements of our theoretical framework (the do's and don'ts).

The results of phase 3 will lead to examples of validated good practices that will be added in the theoretical framework.

4. RESULTS

The research (literature, interviews with experts and representatives in the field and company visits) led to a model of key factors as behavioural determinants that must be considered when dealing effectively with safety issues in interaction with our target group of lower educated and vulnerable employees.

The key factors are:

1. sufficient ***awareness*** of the risks (and of the effects of *one's own actions*);
2. ***motivation*** to do anything about the risks;
3. sufficient ***knowledge*** about possible interventions and safe behaviour, and a lack of ***skills*** to apply that knowledge in practice;
4. sufficient ***control options (***opportunities to actually employ knowledge and skills);
5. [**safe behaviour** as a result];
6. lasting change or ***assurance*** of safety behaviour in the long term.

In addition to the individual, the peer group, the company and the sector are also given as contextual factors in the model. All are combined in our model (Fig. 1).

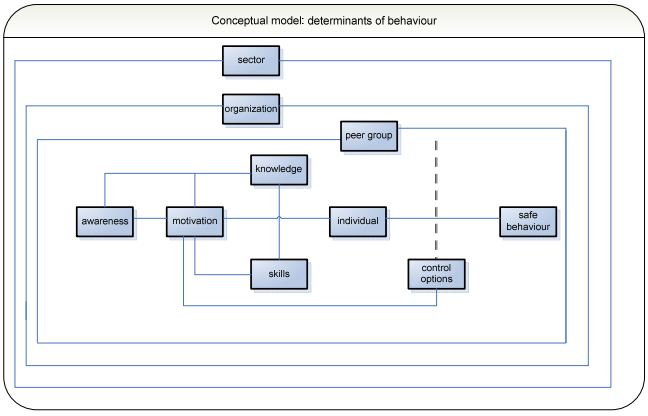

Figure 1: Conceptual model of behavioural determinants

Effective intervention focuses on awareness, motivation, knowledge, skills and behaviour. These factors are described individually, although some factors do, of course, influence others.

In addition to the key aspects, and before designing a safety approach for lower-educated and vulnerable employees, also the contextual influential parties which need to be taken account of, are defined on the basis of the research. A safety intervention for low-skilled employees should also consider the organizational context of

the employee, in addition to the personal characteristics of the employees (with lower education) themselves (Zwetsloot et al. 2006). The following four influencing parties were identified, based on the research and need to be considered in order to ensure an effective approach:

1. the employee and his or her specific characteristics;
2. friends and acquaintances within or outside the organization – in other words, the *peer group;*
3. *managers and supervisors* both as the bearers of the safety culture and in their facilitating role in implementing safety behaviour.
4. the *organization or sector* and its prevailing safety culture.

These factors do, of course, influence one another continually. For example, in the work place, the social norms within the *peer group* can be formed in part due to the safety culture within the organization as a whole or due to management, who, in turn, are also influenced by the safety culture within the company. Combined, the key factors and the influencing parties create our theoretical framework - the 'safety for all' framework (Table 1), for employees with lower education working in dangerous jobs.

	Employees	**Peer group**	**Management**	**Organization**
Awareness				
Motivation				
Knowledge & skills				
Control options				
Assurance				

Table 2: Framework for employees with lower education and dangerous jobs.

Finally, the framework is completed based on the visits that were paid to the companies.

Questions were asked about the characteristics of lower-educated employees that say something about their risk awareness, motivation, knowledge and skills, control options and assurance. We then asked about the influence of the peer group, the manager and the company with regard to the behavioural determinants of the low-skilled employees. This led to a number of issues per cell in the matrix (our framework): the do's and don'ts.

We present our findings pertaining to the framework by illustrating some of the do's and don'ts. They are described per behaviour determinant, varying for the different influential factors (peer group, management, organization /branch).

4.1 Risk awareness

A key condition for an effective intervention for low-skilled employees is that they are at least aware of the most important safety risks. It should be noted that this is not only a question of the objective safety risks, but also of the perception of risks. Both objective and subjective risks should be taken into account when designing safety interventions (Nilsen, 2006).

4.1.1 What can be done to increase the risk awareness of the target group?

Do's and don'ts

- Involve people in the social environment (the community) with a positive stance on safety; for example colleagues who have had experience with accidents in the work place.
- Involve family ('do it for the children').
- Avoid concentrating on long-term risks only. Also refer to short-term benefits (specifically aimed at young men).

- Validate the effectiveness of a company's safety regulations, (are they making an impression? Or is it necessary to look at other forms of instruction such as safety symbols to get the message across?)

- Launch sector-wide initiatives for awareness campaigns aimed at small companies or sectors with large numbers of employees with flexible contracts

4.2 Motivation

Motivation is the key for an effective intervention to change behaviour (Herwig, 1998). Interventions are useless without the intention to do something about behaviour. Awareness of risks will not lead to a change in behaviour if there is no apparent motivation to do so. Motivation can emanate from the employee (intrinsic motivation) or externally (extrinsic motivation). In the case of intrinsic motivation, it is better to be responsive to that motivation. When employees are not intrinsically motivated, it is imperative to look into methods of increasing motivation through external stimuli. It makes sense to link any potential intervention to the personal profit and loss account of everyone concerned. People want to know first and foremost what a potential change will mean for them (Paulussen et al. 2007). Therefore, motivation should be positively formulated in such a way that the target group stands to gain from a possible intervention. The converse is also true: for example, when safe behaviour may result in the potential loss of inconvenience allowances, it will probably lead to negative impact for safety motivation.

4.2.1 What can be done to increase the motivation of the target group?

Do's and don'ts:

- Appeal to the intrinsic motivation of employees and attempt to address them at as high a level as possible on the motivation ladder (appeal not only with regard to safety issues, but also regarding appreciation/ recognition).
- Describe the 'carrots' (tailored to the individual) or impediments (lack of skills, work pressure, etc.).
- Be responsive to expertise and the professional pride of specific jobs.
- Attempt to clarify and communicate the potential 'gain' of working unsafely for the peer group, and try to convert it into a safe working practice.
- Bear in mind that safety interventions could be seen as a threat to the identity of the group *and* to the financial benefits of doing what is perceived to be a 'tough' job. Also use the influence of the private peer group.
- Consider different cultural values and try not to impose the dominant culture (or explain why this may be necessary in certain cases).
- Break the macho culture (subjective group norm) by letting employees know that they will not be seen as a wimp or a moaner if they report unsafe situations to management.
- Where possible, involve the unskilled employees in the development of the intervention – this helps them to become more confident.
- Also involve employees on flexible contracts, using sector-level programmes if necessary.
- Company commitment is just as important as the role of leader: provide the correct preconditions regarding time and facilities. For example, costs should be avoided (or reimbursed) and the intervention (e.g. training) should be implemented during working hours as far as possible.
- Ensure that the company is attentive and respectful, try to highlight a personal difference once in a while.
- Be realistic and do not pursue personal development if there is turmoil because of labour issues, e.g. dismissals.
- Companies should welcome tips and ideas on safe working practices, particularly from their lower-educated employees: if you manage to extract tips, ideas and reports of potentially hazardous situations from this group, you have an optimal start for safety improvement.

4.3 Knowledge and Skills

When lower-educated employees are sufficiently motivated to work safely, the next step is for them to be able to do so. This deals with the question of whether people have enough knowledge and enough skills. As regards 'knowledge', much has already been written about the acquisition of competencies by unskilled employees (Smit et al. 2005). An obvious characteristic of the target group is that traditional, verbal education or training is less successful. As regards 'skills', it is important that people also have the (social) skills to act differently when necessary, for example when addressing the behaviour of employees.

4.3.1 What can be done to increase the knowledge/skills of the target group?

Do's and don'ts:

- Provide a safe learning environment: encourage incident reports rather than chastising employees with unsafe working practices.
- When referring to safe behaviour, make use of role models (from daily life, e.g. a soccer player) and ambassadors during training courses.
- Embed the acquisition of new knowledge in an atmosphere of trust.
- Involve the participants in the development (and also part of the implementation) of the programme.
- In training, be responsive to what is important to the target group, both at work and in private.
- Instructor: focus on what employees can do and not on what they cannot (yet) do and show that you understand any difficulties or resistance to learning that an employee might have.
- Be responsive to the (practical) learning style of the target group.
- Provide learning tools that are connected to the work and are preferably non-verbal.
- Identify resistance within the group and neutralize it as far as possible. Potential strategy: involve (informal) leaders of the peer group in the development of the intervention by making them feel important and giving them some responsibility.
- Ensure that employees also have trust in a positive end result in their own abilities.
- Management must set an example by displaying the new desired competencies.
- Company: formulate safety activities as an opportunity to acquire new skills, make time and money available, preferably during working hours.

4.4 Control options in the working environment

Employees can be aware of the safety risks, motivated to work safely, know how to do so, be able to do so and believe in doing so, yet it still does not happen because there is a lack of control options to show such behaviour, or in other words, the low-skilled employees do not have enough opportunity in the working environment to actually initiate the desired safe working practices, e.g. due to company production targets, or lack of means within the company.

4.4.1 What can be done to increase the target group's control options?

Do's and don'ts:

- Ensure that alternative behaviour is attractive and realistic, also when there is considerable work pressure.
- Prevent a combination of a high workload and limited individual control over the work leading to a lack of a sense of responsibility, also in terms of working safely.
- Ensure support from middle management if the desired behaviour does not suit the prevailing group norm.
- The management style should offer enough opportunity for individual initiative, personal input and, if necessary, trial and error.
- Ensure that the people responsible for formulating policy and procedures have sufficient understanding of the employees' 'triggers' and perspectives.

4.5 Assurance

Safe working practices cannot be implemented overnight. It requires assurance by repeatedly highlighting their importance, by means of training and education, and supervisors and senior management setting a good example. Both are prerequisites for effective intervention.
The aspect of assurance is particularly relevant in organizations that employ large numbers of workers on flexible contracts – one of the groups over-represented at the lower end of the labour market. A substantial turnover of flexible workers means that a structure must be developed that brings new employees' attention to occupational safety to the required level (e.g. integration in the induction programme). It is also plausible that the information or skills provided will disappear rapidly in employees with limited learning ability, thereby necessitating regular repetition of the instructions.

4.5.1 What can be done to increase the assurance among the target group?

Do's and don'ts:

- Ensure that tasks correspond with the work that people are already doing and do not interfere with it.
- Be responsive to the norms and culture of the group.
- Ensure that supervisors are aware of their role model and are consistent in it.

- Continue to inform employees about safety, preferably in tandem with company procedures.
- See to it that you have a permanent team or a permanent group of employees and avoid high staff turnover.

5. DISCUSSION

Our research identified several points of interest and do's and don'ts for developing interventions aimed at stimulating safe behaviour among unskilled employees.

It was shown that the social environment of the individual, i.e. friends, family, colleagues and sometimes the cultural group is very important, and even more important than for the average employee. Involvement and commitment are also very important factors. Performance improves in an environment of attention, time and trust, and there is a belief in a positive outcome. We also observed that intercultural values and competencies in the target group can be far different from what is expected, and one must be aware of this. It is vital to link safety to the group values when promoting safe behaviour. These are in short a few general conclusions.

The conclusions show us that specific characteristics of the target group require specific skills of supervisors and management. It has to be said that, in all likelihood, these 'new' supervisory management skills will have a positive effect when dealing with all levels of employees, although they seem to be extremely important for our target group.

We realize that top management commitment is generally seen as an important factor, however in this study we focus explicitly on safe behaviour and (social) interaction on the work floor (bottom-up approach). Attention is paid to employee interaction within or between teams, and to relationships outside work (peers) and relationships between employees and their immediate supervisors.

In this way we are able to devote explicit attention to the great diversity of the people in the target group (and their different perceptions of work and safety) in terms of age, language, culture, religion, gender, and also health status.

In the next phase of the study interventions will be implemented and their effectiveness measured. It will be interesting to focus more on the measures that deal with multi-cultural aspects and flex workers.

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