Scientific support to an integration of notions of quality and security of the environment, of processes and of production goods in a context of sustainable development Worker protection in the area of Health
Phase II
1999 – 2003

SUMMARY

Final Report of the Project

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Integrated Report written by Anne Sophie NYSSEN with the collaboration of the partners

DEVELOPMENT OF A CRITICAL INCIDENTS REPORTING SYSTEM IN MEDICINE

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Co-ordinator
Prof. V. De Keyser
AS Nyssen
Service de Psychologie du Travail et des Entreprises
Boulevard du Rectorat 5- B32 , 4000 Liège

asnyssen@ulg.ac.be

Prof. M. Lamy
Dépt. d'Anesth. - Réa.
CHU Liège
Sart-Tilman - B35
4000 Liège

Prof. J.L. Fagnart
Faculté de droit, ULB
Campus Solbosch
Av FD Rossevelt, 50
1050 Bruxelles

Prof. P. Baele
Dépt. d'Anesth. - Réa.
Cliniques Universitaires St Luc
Av Hyppocrates,
1200 Bruxelles

Context of the Research

As an introduction to the project, it is useful to understand the issues considering before and during its development and therefore influential in its final format.

Today, more than ever, health care workers face unprecedented demands for production, safety, efficiency, and value. Recent trends to reduce the financial losses in the healthcare system have exacerbated pressures on workers, leading the major medical corporations to strike actions. In doing so health workers are displaying their frustration with the current health system's inability to provide adequate staff coverage and ensure their ability to practice safely in an increasingly dicey worenvironment. While such trends of optimization is undoubtedly motivated, it does highlight the point that despite statements to the contrary,

these financial cuts have and will continue to negatively impact frontline care providers. Doctors are expected to take the rap when something goes wrong but everyone is able to wash his hands of a failure to provide a safe and quality work environment for the thousands of health workers. Nevertheless, there is a common perception that health workers are exposed to stress, having the life of the patient in their hands and having to operate under different critical conditions in scheduled and emergency situations (1,2). The implication of doctors' responsibility in accident investigation only increases these inherent stressful working conditions. Together, they can lead to impaired performance and health.

Anesthetists especially exposed

The statistical investigations carried out by insurance companies on the latter over the past few years show that anesthetists are sued more often than their fellow doctors practicing other specialties (5). This suspicion associated with the stressful work conditions ends up having an impact on the physical and mental health of the doctors, but the data on this is rare. Nonetheless, there are some studies available that can bear witness to this. Suicide among anesthetists (6), for example, has been used as an indicator of the high stress level in the specialty. In a recent study (7), we showed the high level of burnout in the French speaking anesthetist population (40.4%), with a highest score for doctors less than 30 years' old. The consumption of drugs and the abuse of alcohol frequently observed in doctors in training (8,9,10) have also been associated with extreme life conditions in the specialty. In our country and abroad, many institutional health-care providers work through the night and on week-ends and holidays. This is particularly true for medical residents who typically work extensively long hours, sometimes working more than 130 hours per week in shifts of 12 to 60 hours of duration. This pattern raises concerns about worker fatigue, the possibility for medical errors and their impact on the well-being at work.

To the extent that the doctors as well as the hospital staff have expressed their fears of having to face more and more trials and to deal with higher cost of malpractice insurance, we thought that it was important to try to better understand the factors at the origin of medical accidents. It is indeed indispensable that doctors be able to guarantee quality of care in order to reassure any doubts the patient may have and confirm that the resources allocated to medicine are used efficiently. This guarantee can only be made if the performance being questioned is analyzed. The systematic gathering of incidents is part of the indispensable tools for the improvement of the clinical working conditions and the safety of the patient.

Goals of the research

The project aims at the development of a system of reporting and analysis of errors and failures in the medical environment in order to understand their origin, predict their occurrence and draw out corrective and preventive actions. The basis for this in the second program phase is that creating a supportive environment for continuous learning from experience within an organization calls for a strategy of improvement of working conditions, practices and well-being at work. Theoretical foundations for this can be found in the scientific literature on « risks in high-performance work systems » showing the role played by organizational factors (11,12,13,14). Many experts in human factors encourage a culture shift which acknowledges that providers don't fail alone. Organizations and systems have vulnerabilities, as do individuals, and the ingredients of many accidents are present long before a specific incident occurs (15). These latent features, combined with an inexperienced or fatigue caregiver may produce an equipment failure or a medical mishap. We think such mishap represent systems failure.

Our project is the first of its kind in Belgium and abroad in terms of its conceptual foundation (linking safety, quality and wellbeing at work). We were aware that such an information system could, if no precautions were taken, possibly compromises workers targeted by the declaration. That's why the working group which prepared the project included legal specialists, doctors and psychologists in order to resolve the ethical and legal problems of confidentiality and responsibility and to facilitate the change of culture within the working situation.

Research activities and Results

The principles activities of the project are as follows:

1. State of the art of the literature
2. Building a common conceptual framework
3/ 4. Developing a critical incident reporting system, taking into account the study of the emotional and physical consequences of the event for the implied person
5. Application of the Incident Reporting System in natural working Situations
6. Extension of the system to the whole hospital
7. Project of software concept

1. State of the art of the literature

We studied the different data sources on risk in the health sector: epidemiological studies, insurance data sources and reporting systems and classified reporting systems regarding their goals, their methods, their interfaces and their limits in order to characterize our approach. In the United States, the American Foundation for Patient Safety adopted a research project this year that aims to develop a system of systematic anesthesia accident collection on the national level. The Australian project AIMS: the Australian Incident Monitoring Study is certainly the most widely recognized initiative in this area (16). It made it possible to collect over 2000 incidents and has put out over 30 publications (17,18,19). Several safety initiatives were undertaken following the analysis of the results. In Switzerland, the anesthesiology division of the Cantonal University Hospital in Geneva decided to acquire a system of collection of incidents (20). We found three types of goals (prevention, monitoring and legal protection) and 3 types of interfaces. : questionnaires (or reporting form), interviews and automatic data records.

The taxonomy and the methodology for failure analysis developed in our project is in advance of other tools as it aims at illustrating the multi-causal aspect of the accident using the notion of "prototypical risk situation," characterized by some specific combinations of latent and active factors. Another major issue of the project is the application of the Incident Reporting System in practical working situations under the second phase program.

2. Building a common conceptual framework

A consensus is emerging today among researchers to consider the accident, not in terms of causality, but in terms of adaptation, like a sign or the expression of a certain mode of malfunctioning of the system (11,12,13). This current of ideas is based on the development of ergonomic systems initiated by Faverge (21) and focused on the notion of "reliability of systems." This notion is the application to industrial activities of theories on the functioning of living organisms articulated by Von Bertalanfly in 1949 (22). In this perspective, the undertaking is a "sociotechnical system" generally formed of four components: the individuals, the task, the instruments and the work environment, which is organized in view of attaining goals. These elements are interdependent; that is, they are connected by an important network of relationships. The analysis of accidents is a matter for the study of the

characteristics of functioning likely to engender them. It is no longer only centered on the different factors of production taken separately, but on their relationships between them. Reason (11,15) has developed a model of accident based on these ideas. The essential idea is that our knowledge of the accident and of the error largely depends on our understanding of the relationships between the components of the system.

3/4. Developing the Incident Reporting System, taking into account the study of the the emotional and physical consequences of the event for the implied person

This activity was the core of the project. The methodology proposes a series of functional steps that must be fulfilled in order to turn any reporting system: development of the reporting form, data collection, data analysis, recommendations, implementation, following and evaluation. The project aims at capturing the essence of problem situations encountered by workers, which are clearly more than a collection of only negative events, failures or errors. We proposed to collect any kind of incident. An incident is defined as any event or circumstances that happens which could have or did harm someone or which could result in a complaint. The definition has the advantage of favoring the collection of any type of problem situation, including those that ordinarily come up at work but which do not bring on harmful consequences because they have been treated in time ("near misses",23). The goal of the reporting sheet is on recording the information that is relevant to the incident as a whole and therefore will capture the causal factors and reasons of the incident when the form is being completed at all. Our approach is original by a various of elements: a) accent on detection strategies in order the study of defenses of the system, b) study of the emotional and physical consequences of the event for the person in order to support them, c) system wide conception of accident in order to favor a change of culture, d) conceptual link between safety, security and well-being at work, e) free of judgment and penalty.

The working group proposed to develop guidelines for using the Incident Reporting System in order to facilitate successful implementation in the field. Four frames have been considered: medical, technical, organizational and legal frames.

5. Application of the Incident Reporting System in natural working situations

Based on the reflections developed above, we chose to privilege the medical specialty the most confronted to medical lawsuits and with whose we've been collaborating for several years: anesthesia. A pilot experiment is carried out in two anesthesia departments from two different teaching hospitals: CHU of Liege and Cliniques Universitaires de ST Luc (Brussels). Since march 2002, more than 200 incidents have been reported, encoded and analyzed. One of the goal of the system is to learn from data. This gives the analyst a great deal more options when it comes to selecting independent variables of interest but in the same time our systemic approach constaints statistical analysis because of the high number of variables included in the questionnaire. The analyses aim to identify links between causal factors or patterns (clusters) in order to identify prototypical risk situation. Following our proposed approach, direct preventive and corrective responses to specific events have been already recommended and implemented in the hospitals.

6. Extension of the approche across the whole health care system

This experiment has been progressively widened to other high-risk hospital sectors such as day hospital and geriatry using the same methodology 1) observation in the field in order to identify specific risks, 2) interviews, 3) development of a specialized Reporting Form, 4) validation of the form on a sample, 5) presentation of the system to the team, 6) implementation, 7) evaluation.

The system has been extended to the whole hospital with a view to organizing a federal structure.

7. Project of software concept

The focus of the software is to improve usability over a paper form. There are of course many other advantages in terms of simplifying analysis procedures and data storage. The nature of the form is problematic for the software because its size and complexity. Therefore design of the software must disguise unnecessary complexity while serving as a guide to maximize the accuracy and reliability of data inserted. The design of ther user interface is then important. We now develop a preliminary design for the basic layout of the interface.

Conclusions

The project on Incident Reporting System in the Health Care System (PS/12/21) started at the end of 1999 under the OSTC Phase II Scientific support programme on workers' healthcare coordinated by the Ministry of Scientific Research. The experiments and the results of the research can be considered successful so far in terms of its impact on the work conditions and well-being at work but also as a diagnostic tool. The work clearly demonstrated that given a suitable structure, the Incident Reporting System will be able to provide the data require to evaluate risks in complex professional environment with a view to improving the work conditions and well-being at work (following the general goal of the programme).

The workers (health care workers) have been closely involved in the project activities. This constitutes a solid basis for successful change at work. In addition, the involvement of legal specialists as partner of the work group reinforce the legitimacy of the project. It is obvious that there is still a lot of work to be done to raise awareness of the importance of this approach among the general public in order to change the view on error and accident. The challenge for the next year is in fact how to shift the emphasis from the research level towards learning network and the level of a national and international structure.

Key Words

Reporting system, Helath sector, Reliability, Tool for improvement of safety, security and well-being at work

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