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Accident and Whiplash Injuries Prevention in Nigeria

Abstract

Nigeria ranks one of the highest countries in the world with the largest accident, especially when measured by whiplash associated disorders, whereas, traffic safety education rate, data and information been widely known as preventive indicators have been grossly neglected. In Nigeria, traffic safety enlightenment, awareness, political understanding and appreciation of the problem's magnitude are lacking.

This study, therefore, seeks to understand and document the fact that accident causation factors in Nigeria relate more to the problem of development, poverty, knowledge and education as evidenced in most other developing countries.

Among the primary accident causation factors on Nigerian roads are:

- lack of a transportation system or multi-model integration
- sub-standard and obsolete vehicles and road furniture
- poor road maintenance, investment and engineering management
- paucity of road users' and drivers' knowledge, skill, enlightenment and education of the road use

This paper submits that Nigeria being a developing nation requires purely primitive strategies being cost effective (health wise) than curative measures. It is in this light that an enduring, comprehensive and sustainable traffic safety educational programmes information base and data inventory, analysis and implementations form the focus of this study.

This effort will provide basic guidelines framework and implementation procedure for a successful prevention of whiplash associated disorder resulting from road traffic crashes in Nigeria and other parts of the world.

The Problem

A greater proportion of road accidents in Nigeria revolves round the human aspect – the road users/drivers, whereas these are hardly recorded. Basic data and information are lacking, due to awareness, organizational and institutional arrangement take of commitment and poverty.

A poor nation such as Nigeria is hardly able to cope with the crash and post-crash stages, therefore, the only singular and most economic consideration is to adopt prevention measures rather than curative ones.

A problem, which to a great extent still exists, is the limited knowledge about the injury mechanisms, that is, when and how the injuries are generated and at which level they are produced.

Knowledge of impact biomechanics and crashworthiness is the requisite for injury prevention, through fundamental research, which results in the developing principles for effective countermeasures.

This paper will therefore contribute towards developing a guideline to ensuring enduring plans and policy packages for adopting traffic safety education, data collection; usage and management for crash and whiplash prevention.

Research Design

The crash causation factors Investigate are behavioural, road environment and investigation. The management strategies are education, data and information inventorying, which form basic tenets.

Educational packages identified include

- awareness creation at all levels
- curriculum development
- training and retraining programmes
- behavioural studies
- environmental education
- visual impression and Geographic Information Systems (GIS)

Methodology

The study methodology will employ and integrate both descriptive and quantitative approaches at

preventing physiotherapeutic disorders. Roles allocation are to the informal operators – parents, community based and non-governmental organizations, Red Cross Society, religious organizations, voluntary organizations; and formal operators – nursery, elementary, secondary and tertiary institutions, and Research Institutes.

The data required are multi-eclectic and dimensional in approach. Data collection regard the individual operators level of understanding through questionnaires drawn to enquire for before and after crash situation.

- Communications design with credibility
- Observations
- Interviewing, recording and applications
- Questionnaire on Accident reporting
- Photographic illustrations

Nigerian Road Traffic Crash Environment – An Empirical Analysis

Crashes of motor vehicles are not only the leading cause of death in young and middle-aged people, they account for more than 50% or all mortality among young people in their late teen age. They also cause more death of people aged 1-60 than any other injury – producing events. Over 60 percent of severe brain injuries and acute spinal cord injuries are associated with motor vehicles. They cause the most severe permanent medical impairment and most expensive health cost among the injured. This results in an enormous burden on medical resources and huge economical losses for Nigeria.

The nature of the revealed problems implies interdisciplinary solutions, towards having total system improvements.

These include legislative measures, knowledge on the sensory-motor characteristics of the driver and vehicle dynamics, but more importantly road user education.

In order to maximize the overall efficiency and safety, education and training are necessary complements to legislation and vehicle design. However, these steps should not be taken as substitutes for immediate technological measures when they are possible. Some vehicle dynamics phenomena are known and should be explained in driver education to make the requirements on the

drivers more reasonable. As such, results from empirical research can be spread and used in education of other road users as well.

Whiplash Injuries and Preventive Measures

Whiplash injuries have been one of the most controversial issues in medicine for over 100 years and at the forefront is the problem of low velocity collisions. Rear impacts often result in neck injuries to the occupants of the struck car. Driving the collision, the vehicle is subjected to a forward acceleration and the car occupants are pushed forward by the seat backs. The head moves forward and stops in a somewhat flexed neck posture. This type of swift injuries extension – flexion motion of the neck is usually called "Whiplash motion". The injury symptoms following neck trauma in rear-end collisions include pain, weakness or abnormal response in the neck, vision disorders, dizziness, headaches and unconsciousness (LOVSUND, 1996).

For effective preventive measures on whiplash injuries, the following four aspects of knowledge should be well understood through sound education and data inventorying and analysis.

1. Strong laws of physics, that is, the physical laws that determine the movement of the body during a collision, and the role they play in whiplash.
2. Biomechanics – detailed analysis of human movements during a collision with information on occupant.
3. Mechanisms of injuring – understanding each phase of the collision and probable injuring type which may occur, as well as the myriad anatomical structures that can be traumatized in a low speed collision.
4. Factors and variables involved in whiplash injuries – seat back characteristics, air bags, body position and posture, head restraints, bumpers, road conditions, seat-belts and defensive driving.

Biomechanics – Health Losses and Costs Reduction

Countermeasures within the traffic safety can – definitely be regarded as a potential increase of the

public health. Countermeasures have to be taken in general areas, and require a multidisciplinary approach. So far the most effective results have been achieved by injury preventive measures. This requires an increased basic knowledge about impact biomechanics and crashworthiness, as there are many gaps which still require further research.

The central research design for whiplash reduction can be summarized as follows:

- Analyse traffic accidents and the produced injuries and perform reconstructions.
- Identify and define injury mechanisms with regard to different types of loading conditions.
- Quantify the physical responses of body tissues and organ systems with regard to various impact conditions (structural effects).
- Determine the level of response (magnitude, duration, strain rate, etc.) at which the tissues and systems will fail (functional effects).
- Develop mechanical and mathematical models, which respond to various impacts in a human like manner, for development and evaluation of protective systems.
- Develop protective materials, structures and systems that lower the level of impact energy and force in order to reduce the risk of injury.

When designing less injurious environments to improve the protection of car occupants it is necessary to have a thorough understanding of the mechanisms that cause injuries and disabilities. Furthermore knowledge of the effects of specific kinds and amounts of energy on specific human tissues is required as well as knowledge of material mechanics of non biological materials such as polymers and the interaction between them.

Research in biomechanics thus involves a variety of disciplines, including engineering (e.g. mechanics, solid mechanics, material mechanics, measurement techniques, applied physics, thermos – and fluid dynamics), physiology, medicine, biology, anatomy, dentistry, and epidemiology.

Epidemiology of Injury

A prerequisite for the scientific study of injury is the acquisition and analysis of data on which to base

priorities and research. The situation today in data validity and reliability can be highly questioned in the sense, that controlled studies of human tolerance, accident severity distribution and effectiveness of protective systems etc. cannot be performed in a scientifically correct way. Errors and confounding factors are known but complicate to control or diminish. The research goal is to develop methods to collect high quality data from real accidents, including on-board techniques. It is also of importance to develop methods to describe the outcome of injuries in a way that is valid for one individual and for the population at risk including especially long-term consequences and the loss of health. By combining reliable data on exposure and valid measurements of injury, dose-response models for accident research can be developed in the future.

Whiplash Injury Reduction Strategies

Implementing the strategies:

1. Raising awareness on Whiplash Injury Reduction Strategy through – traffic safety education on the basis of the Instruction Guideline of Traffic Safety Education
 - more participatory, practical education methods through risk evaluation and danger avoidance in an air of familiarity actions review and adoption of safe standards of behaviour
 - publicity and awareness creation
 - reflective materials being advertised and promoted
2. Creating a safe traffic environment through installation and provision of basic safety devices, traffic signals and facilities which ensure safety.
3. Education license renewal lectures and driver aptitude
4. Brakes requiring less strength
5. More research studies for formulating safety strategies
6. Installation of a road traffic system using sophisticated telecommunications systems
7. Complete compliance with seat-belt usage requirement

8. Community traffic safety education
9. Public relations campaign concerning the use of mobile telephones while drinking
10. Introduction of comprehensive surveys on traffic safety
11. Improvement of safety standards for road transport vehicles
12. Development of assistance on the Advanced Safety Vehicle (ASV)
13. Vehicle Safety Information Service
 - Here collision safety performance and other vehicle safety performance data should be collected and communicated in a form which is easily understandable for users

Traffic Safety Education

Road traffic safety education in Nigeria and other places could focus on

- the responsibility of vulnerable road users,
- appealing to the attitude of drivers to voluntarily drive more carefully and responsibly promoting secondary safety measures, such as the use of seat-belts, child restraints, conspicuity aids, cycle helmets, and ever more crashworthy cars.

Introducing road safety education in school children's curriculum is very important. Although road safety education has faced a lot of criticism it still remains one of the effective measures in road traffic accident reduction and prevention.

This paper emphasizes that training and retraining of the drivers is a formidable means of effectively dealing with the issue of whiplash reduction.

Conclusion

This study pursues both qualitative and quantitative approaches, ensuring discussions on training, retraining from analysis and results presentations on the level of success. The outcome of which would be the reduction whiplash-associated disorders by a certain percentage over a visionary period of 10 years. The research results form a sound basis for future traffic safety environment devoid of whiplash-associated disorders by 50% over 10 years.