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## PHYSIOTHERAPISTS' PERCEPTIONS OF THEIR ROLE IN THE MANAGEMENT OF MOTORCYCLE-RELATED HEAD INJURIES IN KENYA

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### ABSTRACT

**Background:** As motorcycle ownership remains an all-time high, the incidences of motorcycle-related deaths and traumatic brain injuries are expected to remain at high levels due to poor safety adherence by motorcycle users. Information regarding the role played by physiotherapists would assist to develop a motorcycle safety guide that would put into consideration the role of health professionals with an aim of preventing motorcycle injuries and death.

**Objective:** To identify the perceptions of physiotherapists on their role in the management of motorcycle-related head injuries at Moi Teaching and Referral Hospital in Kenya.

**Design:** An exploratory design was used to answer the research question.

**Setting:** Moi Teaching and Referral Hospital in Kenya.

**Subjects:** Eight (8) physiotherapists agreed to participate in the study.

**Results:** The results revealed that the participants expressed their main role to be assessment and treatment of patients with motorcycle-related head injuries. With regards to prevention, secondary and tertiary prevention was practiced by the majority of the participants. The participants however reported that they should also engage in primary prevention activities. Health promotion was perceived by the participants to be within their scope of practice and even gave recommendations for public education programs and policy enforcement to assist in reducing motorcycle injuries.

**Conclusion:** The participants expressed their concerns on the increasing cases of motorcycle injuries. There is a need for public education programs on motorcycle safety to create awareness in the community and the society.

### INTRODUCTION

Motorcycle users are among the vulnerable road users and this is associated with an

increase in motorcycle use in many developed countries (1). This means of transport is preferred in developing countries because they are relatively cheap

and easily accessible. In addition, motorcycles can easily navigate through poor roads and assists to fight poverty and unemployment among the youth (1). On the contrary, the safety record for motorcyclists is considered poor when compared to other road users. Koonstra et al. (2) states that riding a motorcycle is 20 times more dangerous than driving a car and a motorcyclist is 3.5 times more likely than a motor vehicle driver to get injured due to exposure of their bodies (3).

Head trauma is the leading cause of death, severe injury and disability among motorcycle users (4). The global prevalence of motorcycle-related head injuries indicates that it is the most common injury beside injuries to the extremities (5). Head injuries remain the most fatal of all motorcycle-related injuries (6). Saudi and Mutisto (7) reported that head injuries, low Glasgow Coma Scale (GCS) and admission to an ICU were associated with high mortality rates in people following RTAs. A large body of literature indicates that the etiology of motorcycle-related head injuries is associated with unsafe behaviours including alcohol intake, over speeding and lack of proper safety equipment (8).

Patients with motorcycle-related head injuries at Moi Teaching and Referral hospital (MTRH) are admitted and managed by a multidisciplinary team in the intensive care, neurosurgical and orthopedic units. Physiotherapists are part of this team and have a role to play during the acute, sub-acute and long term phases of recovery in patients with severe head injuries (9). The role of physiotherapy is not limited to therapeutic aspects but also includes prevention (primary, secondary and tertiary) and health promotion (10). Holmberg and Lindmark (9) stated that some of the roles physiotherapists engage in while managing patients are that of an inspirer, instructor, consultant and educator. In order to define and implement

appropriate management of motorcycle-related head injuries, reliable data is required. An in-depth study on the role played by health professionals such as physiotherapists in the management of motorcycle injuries is not available. Thus the purpose of the study was to investigate the role of physiotherapists in the management of motorcycle-related head injuries at Moi Teaching and Referral Hospital in Kenya.

## MATERIALS AND METHODS

**Setting:** The study was conducted at Moi Teaching and Referral Hospital (MTRH), Kenya, the second largest teaching and referral institution in the country with a bed capacity of 1000. MTRH is located in Eldoret town, Uasin Gishu County and caters for both private and public patients from all parts of the country.

**Participants:** The population consisted of physiotherapists working in Moi Teaching and Referral Hospital. The study sample was purposively selected from physiotherapists working in ICU, Neurosurgical and Orthopedic wards. According to Carpenter and Suto (11), purposive sampling "involves the deliberate selection of particular settings, persons, or events for the important information they can provide that cannot be acquired through other means". In this study, the three settings were chosen because they represent the units where many patients with motorcycle-related head injuries are admitted and receive treatment by physiotherapists. The number of physiotherapists working in the ICU was 10 while a total of seven (7) worked in the neurosurgical and orthopedic units. Fourteen physiotherapists were present during the time of data collection and were invited to participate in the study. Eight (8) of the invited physiotherapists agreed to participate. The remaining six (6) were

unable to participate because of work schedule or matters out of their control.

An exploratory design, utilizing a semi-structured interview guide, was carried out among eight physiotherapists who agreed to participate in the study. The venue was assessed before the interviews to ensure that there was no interference with the quality of the tape recordings. Written, informed consent was obtained from each participant before the interviews. The researcher explained to each of the participants that their participation was voluntary and they had the right to withdraw from the study at any time. All the eight interviews were conducted by the researcher. English was the preferred language of communication. The individual interviews lasted approximately 45 minutes each and a probing technique was used to ensure that no information was missed. The interviews were audio taped and the research assistant took field notes during every interview. The tape recordings were played to each participant at the end of the interview for clarity and to confirm what was discussed during the interview.

**Data Analysis:** The process of qualitative data analysis began by transcription verbatim of the audio taped interviews by an independent person with experience in

transcription to produce a manuscript. Hammel and Carpenter (12) noted that verbatim transcription of the data preserves the words of the participants. The transcriptions were compared several times to the audiotape recordings and field notes to ensure accuracy. Thematic analysis was done manually on two levels; analysis of individual data was carried out and across all participants comparing all the themes and categories. According to Braun and Clarke, (13) thematic analysis is a method used to identify, analyse and report themes from the data collected. The transcriptions of all the interviews and process notes were read several times to familiarise the researcher with the content. Common ideas were coded into emerging themes which were then grouped into broad categories. After the derivation of themes, and the study supervisor read through the transcripts and generated themes that were then compared to the themes of the researcher. Code-recode process increases trustworthiness in qualitative research (14).

## RESULTS

Table 1 below illustrates the socio-demographic profile of the participants.

**Table 1**  
**Physiotherapists**

Participant	Age	Gender	Marital Status	Place of work	Years in practice	Years in the unit
1	39	Male	Married	Intensive Care Unit	11	7
2	52	Male	Married	Intensive Care Unit	20	10
3	34	Male	Married	Orthopaedics	8	1
4	36	Female	Married	Intensive Care Unit	10	5
5	38	Female	Married	Neuro-surgery	12	5
6	35	Female	Married	Neuro-surgery	10	3
7	28	Male	Married	Orthopaedics	4	1
8	31	Male	Married	Neuro-surgery	6	2

## ASSESSMENT

Physiotherapists perceived assessment of the patient with brain injuries due to motorcycle accidents as very important in assisting them to understand the patient's condition and planning for appropriate treatment strategies. The sentiments concerning this sub-theme are indicated in the excerpts below.

"...My role as a physiotherapist starts from the assessment point of view..." (P5)

"...Now the main role of the physiotherapists is to first of all assess the patient, find out the needs of the patient..." (P3)

Following assessment of the patient, the participants stated that they plan the management of the patient. The participants felt that treatment should be individualised, depending on the condition of the patient.

"...As physiotherapists we handle patients differently, depending on the presentation. We don't give the same management..." (P3)

## TREATMENT

The participants strongly perceived that their main role when handling patients with head injury is to provide treatment. In the acute phase, their main aim is to prevent the development of complications. According to the participants, complications often occur in patients with head injuries. Participant (P3) responded as follows:

"...Now, the first role of the physiotherapist is to ensure that the patient who is bedridden doesn't develop any complications. The first one to start with is respiratory complication. Now as

physiotherapists you ensure that the chest is clear i.e. pre-operatively..."

The types of treatment used in the acute and sub-acute phase were reported by the participants. Most of the participants perceived that the types of treatment in both phases differ. In the sub-acute phase the patient is more stable and can follow instructions compared to the unconscious patient in the ICU. Some of the interventions used in the acute phase include chest physiotherapy, positioning and turning of patients and therapeutic exercises. Participant (P4) and (P6) responded respectively:

"...Aah, right now like in the place I am (ICU), the patient is on a ventilator support and they have a lot of secretions. The management here is chest therapy, suctioning, exercises to maintain range of motion, contractures, maintaining muscle tone. Then there is positioning which is very important for head injury patients because there is a way you are supposed to position. At times we do turning to take care of pressure sores..."

"...In the ICU it is more of the same but you know they are on ventilators. So we majorly do chest physiotherapy of course; suction, postural drainage, passive stretching and positioning..."

Rehabilitation was done mainly when the patient was discharged from the ICU and referred to the ward where the patient is considered to be in the sub-acute phase. The main aim of rehabilitation, according to the participants, is to increase functional activity of the patients. The role of the multidisciplinary team is also highlighted by the participants as they perceived that rehabilitation of the patient cannot be done by the physiotherapists alone.

"...the main aim now is that as a physiotherapist we are working with other members of the team to ensure that the patient is as independent as possible. If not, because of the severity of the condition, we try and make the patient as comfortable as possible to graduate the patient to whatever level that he can reach..." (P3)

"...maybe as they get out of ICU to the ward and maybe he/she is in a position to follow instructions you can now start rehabilitation. You can involve the relatives/caretakers; show them what they are supposed to do..." (P4)

Some of the rehabilitation interventions proposed for the sub-acute phase, as stated by the participants, includes sit to stand training, mobilisation and balance training.

"...When the patient is in the sub-acute stage that is where we really come in for rehabilitation. We train the patient to sit and stand, we train patient to achieve functional activity..." (P5)

"...if they are out of ICU they are followed up by other physiotherapists in other units to ensure the patient comes up from lying to sitting, standing position and balancing; though balancing starts from far during sitting position; then finally ambulate the patient..." (P6)

### HEALTH PROMOTION

Most participants perceived that health promotion is within their scope of practice and they are involved in health promotion when managing patients with motorcycle-related head injuries. Their views concerning health promotion include:

"...Physiotherapists have a role to play in health promotion because physiotherapists are also trained to work in communities as

community based rehabilitation officers..." (P3)

"...We normally do health promotion ..." (P1)

However, some participants did not understand what health promotion is and the researcher reminded them about it. This was surprising because health promotion is taught during physiotherapy training.

"...Health promotion...mmh...What do u mean by that? ..." (P2)

"...In terms of health promotion...as in what do you mean? ..." (P5)

"...Health promotion... (Long silence) I don't know how to explain in what direction..." (P6)

The views of some of the participants illustrate that health promotion comprised of educating the patients and/their relatives. Furthermore, the participants gave advice to the patients and their relatives on the importance of practicing safety when using motorcycles, especially in terms of using protective gear such as helmets.

"...We educate them (patients) on the use of helmets because most of them get head injuries because they didn't use helmets and protective gear and also we tell them to get the licenses before driving..." (P8)

"...Yes, we only reach to family members; maybe the patient is not taking instructions and might not recover quickly. We educate them on the use of protective gears when using motorbikes..." (P4)

The main aim of education was to prevent the occurrence of another incident because of the high chance that the survivors would go back to motorcycle driving and sustain

another accident. The excerpt below demonstrates:

"...If there is a case that requires counselling and some patients go back to normal, they have to be educated to avoid a similar incidence...don't forget that even when we are in the unit, you find a case that require counselling because not all patients die, we have seen people who have survived and they go back to the same thing, because you have to feed your family and yourself, so we have to educate them on safety, how you can avoid another case..." (P2)

Most of the participants felt the need to participate in more health promotion activities, because they perceived that it could help to reduce motorcycle accidents and the burden brought about by motorcycle-related head injuries. The participants spoke about educating the patients as well as people in the community, including the riders.

"...I think sometimes in the coming days we need to organize for health education and safety measure advice to the community to those who are either affected and those who are not so that we may reduce on the accidents..." (P3)

"...If we can try to avoid head injuries... we can give advice to whoever is involved and when using the motorcycle you talk to the person riding the motorcycle. You tell them to wear helmets..." (P7)

"...We should educate them to reduce the cases because currently they are so many. If we can reduce the cases, we can even lessen their burden because head injuries are costly. Patients can stay for long and even their surgeries-neurosurgery is quite expensive..." (P8)

## PREVENTION

The participants' response on prevention varied, depending on an individual's understanding of the term. The participants responded on primary, secondary and tertiary prevention.

For primary prevention, the physiotherapist's responses indicate that little is being done in this category, although the participants felt that they had a role to play, as stated by participant (P3).

"...Primarily we have a role to play. As I said earlier, we need to mobilize the community in preventing accidents. So as physiotherapists we really have to a role to play in preventing accidents primarily..."

Primary prevention practice was difficult for most of the participants because they were not in direct contact with motorcycle users before the accident. They only had a chance to educate the survivors and the relatives once the patients were admitted to hospital.

"...Primary means before the injury? We do very little... physiotherapy not so much, we don't do much when they are outside but we do much when they are still in hospital..." (P5)

All the participants felt that they need to play a more significant role in primary prevention in the future. The participants suggested that for primary prevention to be successfully implemented, they need to get involved in activities outside the hospital.

"...If we do primary education it can help us do away with secondary or the secondary becomes minimal. We need to ensure that Community Based Rehabilitation is functional..." (P3)

"...Usually as preventive care, "prevention is better than cure". We should go for outreach services like walks to enlighten the importance of prevention. Currently we don't have, but I think we should emphasize on prevention...I suggest the physiotherapists should dwell more in preventive measures by creating awareness on the use of helmets for both the rider and the passenger..." (P8)

One participant talked about conveying information by organising functions that would attract members of the public and in turn take the opportunity to educate them on road safety.

"...Unless primary education is done there (community), they will keep on coming. So in terms of Community Based Rehabilitation, we should organize for seminars, social functions like sporting activities after which this information is delivered, be it in terms of pamphlets, be it captured in photographs of patients who are willing so that when we are educating them primarily we can show evidence. So as physiotherapists we can also play that role. If we do primary education it can help us do away with secondary or the secondary becomes minimal..." (P3)

From the responses of the participants it is clear that for motorcycle safety to be practiced, it should begin from the policy makers. The views made by participants indicate that the government should take an active role through policy implementation.

"...That's the issue of policies to be put in place ..." (P6)

"We should start from the government. Teach them on importance of really forcing things to happen..." (P5)

For secondary prevention, the participants agreed that they had a major role to play post-accident. Secondary prevention, according to the participants, was done by managing the patients early so as to prevent the development of complications.

"...We have roles to play in the three types of prevention but more so we have a major role to play in secondary prevention because that is when we are exposed to what is on the ground..." (P3)

Participant P3 felt that emphasize should be on secondary prevention. All patients who possibly needed physiotherapy management, but were not referred by the physicians should be identified early.

"...The other role that we should not let go is secondary prevention where by the accidents have happened we have to prevent conditions from worsening we need to capture all the patients in this condition. Some are admitted at casualty and they may be having STI and they are given some drugs and discharged..."

A few participants, in reference to tertiary prevention, stated that patient follow up and home programmes helped to ensure that the condition of the patient did not worsen after discharge.

"...We involve the family in patient care before discharge. We make sure if there are some exercises done they should continue at home (home programme)..." (P1)

"...Once the patient is stable, he is discharged from hospital. When he goes home they are advised to come back to hospital for follow up treatment..." (P7)

## DISCUSSION

The participants stated that their role in the management of these patients started with an assessment of the patient condition. This is in agreement with a study which highlighted that physiotherapists assess patients with the aim of getting more information on the physiological and functional level of the patient, rather than on the medical diagnosis given (15). Holmberg and Lindmark (9) further reported that physiotherapists assess patients with traumatic brain injury using functional measures, non-standardised and standardised assessment tools such as gross motor functional measure, motor assessment scale and the Berg balance scale among others. According to the participants in the present study, the assessment of the patient would assist to plan an individualised treatment for the patient. Rinehart (16) stated that treatment programs for patients with head injury should be individualised because patients display unique problems which depend on the extent and the level of brain damage.

Treatment is an important component of the physiotherapists' role and it is one of the major variables for this study. The participants mentioned the interventions given to patients when they are in the acute and sub-acute phases of recovery. They further affirmed that the treatment interventions given during the acute phase were aimed at prevention of development of complications such as chest congestions, pressure sores and contractures. This was in agreement with (17) on rehabilitation of patients with brain injury and (18) on the treatment of critically ill patients by physiotherapists. Clini and Ambrosino (18) listed some of the techniques used by physiotherapists in the ICU including chest physiotherapy, mobilisation (exercises) and muscle retraining. Swann (17) highlighted that physiotherapists use passive

movements, positioning and chest physiotherapy to prevent secondary complications such as contractures, pressure sores and chest congestion. Participants in the present study reported that they use chest physiotherapy, positioning and turning and therapeutic exercises in the acute phase. These interventions were also found in the quantitative phase of the study. In the sub-acute phase, the participants revealed that the management was basically rehabilitation aimed at restoring the patient's functional capacity. Khan et al. (19) stated that the aim of rehabilitation is to restore the patient to his/her previous level of function. Unlike rehabilitative management initiated by the participants in the sub-acute phase, a study on the importance of rehabilitation and mobility of patients in the intensive care unit reported that early rehabilitation is effective in improving muscle strength, physical function and the quality of life of the patient (20). Therefore, rehabilitation should start in the acute phase to improve the outcome of the patient with a traumatic brain injury.

In terms of health promotion, the participants stated that health promotion is within their scope of practice. This is in line with the health promotion model which highlights that health professionals should practice and participate in health promotion activities (21). However, some of the participants did not understand the meaning of health promotion. Therefore, the best way to ensure that health promotion is practiced by health professionals is to facilitate health promotion during training and by incorporating it in continuous educational courses. A study by Joseph (22) found that only a quarter (26.5%) of physiotherapists working in Gauteng province in South Africa underwent formal training in health promotion while more than half (60.9%) have never received training on health promotion at their place of work. According to Perrault (23) intensive

efforts are needed in the field of physiotherapy so as to expand the principles and practices of health promotion both at individual and community levels.

The participants further mentioned that they educate the patient and the relatives on the importance of practicing safety measures as a means of health promotion. The health promotion model regards this kind of educational efforts as risk factor orientated aiming at eliminating particular risks factors (i.e lack of helmet use, over-speeding) leading to prevention of more injuries (21). The use of patient education by the participants supports the findings by Perrault (23) that physiotherapists use health education as a means of health promotion compared to the empowerment centered form used by other sectors. The participants also felt the need to participate in more health promotion activities in order to reduce the burden of motorcycle-related head injuries on the society.

The participants agreed that they have a role to play in prevention, especially secondary prevention. In terms of primary prevention, the participants responded that they do little because they are not in direct contact with motorcycle users before the accident. However, they perceived the need to do more of primary prevention in order to reduce incidences of motorcycle injuries through community based rehabilitation and public education programs (outreach activities). This is in agreement with Cohen and Chehimi (24) who stated that primary prevention can be done by health professionals by enhancing individual knowledge and skills. The participants mentioned their main role in secondary prevention which entails prevention of complications as stated by APTA (25). Few participants talked of tertiary prevention. However, the few that addressed the issue highlighted the use of a home programme and follow up treatment through outpatient management.

This study highlights substantial perceptions, motorcycle injuries have become rampant and health professionals view that it is critical to engage in health promotive and preventive measures besides curative interventions. Policy enforcement is also considered fundamental in the reduction of motorcycle accidents and its impact.

### LIMITATION

The researcher focused on the perceptions of physiotherapists on their management of motorcycle-related head injuries, their views on other head injuries due to other causes was not included. However, the perception of the participants on the treatment of head injuries was not determined by the cause of the injury. The findings of the current study are based on purposive sampling; hence the results of the study may not be generalized except to similar settings.

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### REFERENCES

1. Kumar, A. Understanding the emerging role of motorcycles in African cities. A political economy perspective. Urban Transport. 2011. Cited September 09, 2013, Available from: <http://siteresources.worldbank.org>.
2. Koornstra, M. K., Broughton, J., Cauzard, J.P. et al. Transport safety performance in the European Brussels, European Transport Safety Council. 2003. Cited September 14, 2013, Available from: <http://www.etsc.eu/oldsite/statoverv>.
3. Monk, J.P., Buckley, R. and Dyer, D. Motorcycle-related trauma in Alberta: a sad and expensive story. Canadian journal of surgery. 2009; 52:E235-40.

4. World Health Organization. Constitution of the world health organization. 2006. Cited October 19, 2014, Available from: [http://www.who.int/governance/eb/who\\_constitution\\_en](http://www.who.int/governance/eb/who_constitution_en).
5. Solagberu, B.A., Ofoegbu, C.K., Nasir, A.A. et al. Motorcycle injuries in a developing country and the vulnerability of riders, passengers, and pedestrians. *Injury prevention*. 2006; 12:266-8.
6. Carrasco, C. E., Godinho, M., Barros, M. B. A. and Rizoli, S. Fatal motorcycle crashes: a serious public health problem in Brazil. *World Journal of Emergency Surgery*. 2012; 7: 22-25.
7. Saidi, H. and Mutisto, B.K. Motorcycle injuries at a tertiary referral hospital in Kenya: injury patterns and outcome. *European journal of trauma and emergency surgery*. 2013; 39:481-5.
8. Stella, J., Cooke, C. and Sprivulis, P. Most head injury related motorcycle crash deaths are related to poor riding practices. *Emergency medicine*. 2002; 14:58-61.
9. Holmberg, T.S. and Lindmark, B. How do physiotherapists treat patients with traumatic brain injury? *Advances in Physiotherapy*. 2008; 10, 138-145.
10. American Physical Therapy Association Today's Physical Therapist: A Comprehensive Review of a 21st-Century Health Care Profession. 2011. Cited September 9, 2014, Available from: <http://www.apta.org>.
11. Carpenter, C. and Suto, M. Qualitative research for occupational and physical therapists: a practical guide (2nd ed.). Oxford: Blackwell; 2008
12. Hammell, K.W. and Carpenter, C. Qualitative research in evidence based rehabilitation. (1st ed.). China: Churchill Livingstone; 2004
13. Braun, V. and Clarke, V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006; 3, 77-101.
14. Krefting, L. Rigor in qualitative research: The assessment of trustworthiness. *American Journal of Occupational Therapy*. 1991; 45, 214-222.
15. Grill, E., Quittan, M., Huber, E.O., Boldt, C. and Stucki, G. Identification of relevant ICF categories by health professionals in the acute hospital. *Disability and Rehabilitation*. 2005; 27, 437-445.
16. Rinehart, M.A. Considerations for functional training in adults after head injury. *Physical Therapy*. 1983; 63:1975-82.
17. Swann, J. Rehabilitation of patients with head injuries. *British Journal of Healthcare Assistants*. 2013; 3, 7-9.
18. Clini, E. and Ambrosino, N. Early physiotherapy in the respiratory intensive care unit. *Respiratory Medicine Journal*. 2005; 99, 1096-1100.
19. Khan, F., Baguley, I.J. and Cameron, I.D. Rehabilitation after traumatic brain injury. *Medical Journal of Australia*. 2003; 178, 290-295.
20. Parker, A., Needham, D.M. The Importance of Early Rehabilitation and Mobility in the ICU. *Managing Post-Intensive Care Syndrome in the ICU*. 2013. (Cited 2014 August 23). Available from: <http://www.sccm.org/Communications/CriticalConnections/Archives/Pages/>
21. Downie, R.S., Tannahill, C. and Tannahill, A. Health promotion: Values and models. (2nd ed.). USA: Oxford University Press; 1996
22. Joseph, M.P. Knowledge, attitudes and practices of physiotherapists regarding their role in health promotion in Gauteng province, South Africa. Master's thesis. University of Limpopo; 2011
23. Perreault K. Linking health promotion with physiotherapy for low back pain: a review. *Journal of Rehabilitation Medicine*, 2008; 40, 401-409.
24. Cohen, L. and Chehimi, S. The imperative for primary prevention. *Prevention is Primary: Strategies for Community Well Being*, 2010; 1.
25. American Physical Therapy Association Guide to Physical Therapist Practice. *Physical Therapy*, 2001; 81, 9-744.