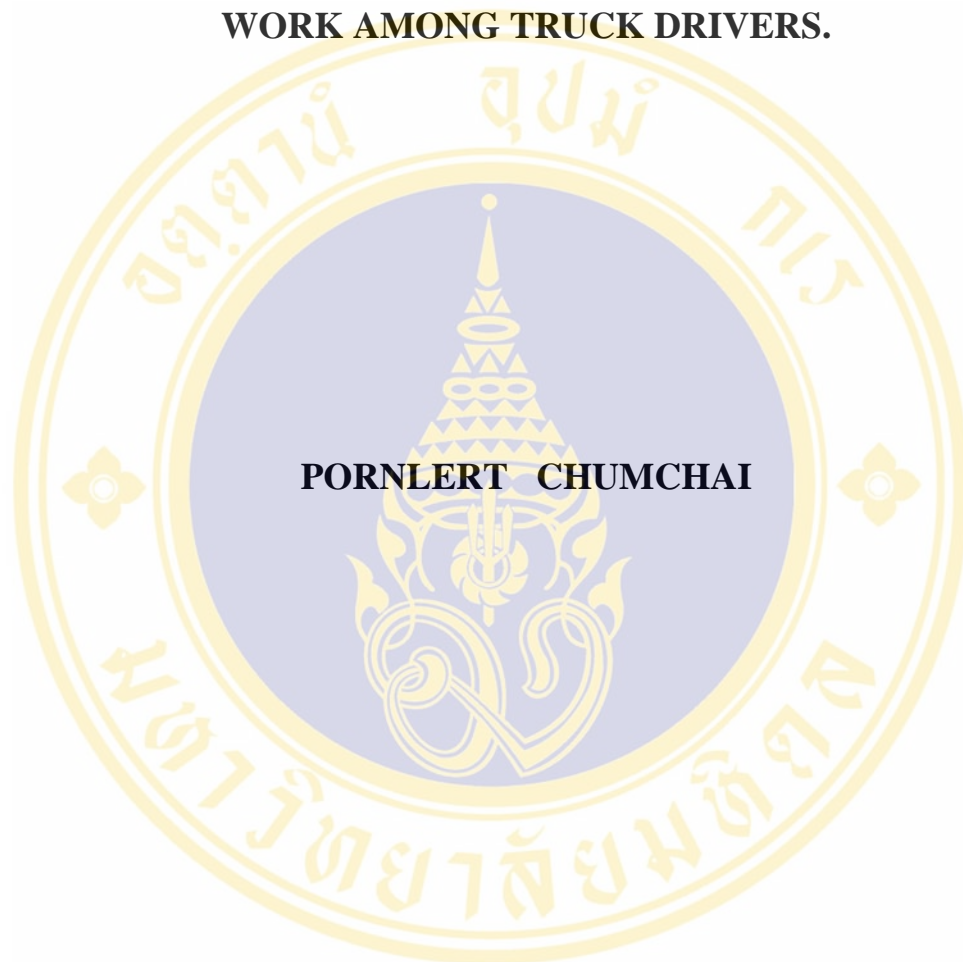


**THE RELATIONSHIP BETWEEN DRIVING ANGER WORK
ABILITY JOB CHARACTERISTICS AND ACCIDENTS AT
WORK AMONG TRUCK DRIVERS.**



PORNLEERT CHUMCHAI

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE (PUBLIC HEALTH)
MAJOR IN PUBLIC HEALTH NURSING
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY**

2007

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Thesis
entitled

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Pornlert Chumchai

.....
Mr. Pornlert Chumchai
Candidate

Pimpan Silpasuwan

.....
Assoc. Prof. Pimpan Silpasuwan,
Ed.D.(Population Education)
Major-Advisor

Chukiat Viwatwongkasem

.....
Assoc. Prof. Chukiat Viwatwongkasem,
Ph.D.(Statistics)
Co-Advisor

Tassanai Wongsuwan

.....
Mr. Tassanai Wongsuwan,
M.A.(Counseling Psychology)
Co-Advisor

Jirash

.....
Prof. M.R. Jirason Svasti, Ph.D.
Dean
Faculty of Graduate Studies

Sunee Lagampan

.....
Assoc. Prof. Sunee Lagampan,
Ed.D.(Curriculum Research and
Development)
Acting Chair
Master of Science (Public Health)
Major in Public Health Nursing
Faculty of Public Health

Thesis
Entitled

**THE RELATIONSHIP BETWEEN DRIVING ANGER WORK
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was submitted to the Faculty of Graduate Studies, Mahidol University
For the degree of Master of Science (Public Health)
Major in Nursing Public Health
on
April 18, 2007

Pornlert Chumchai

.....
Mr. Pornlert Chumchai
Candidate

Somkiat Siriruttanapruk

.....
Dr. Somkiat Siriruttanapruk,
Ph.D.(Occupational Health)
Chair

Pimpan Silpasuwan

.....
Assoc. Prof. Pimpan Silpasuwan,
Ed.D.(Population Education)
Member

Tassanai Wongsuvan

.....
Mr. Tassanai Wongsuvan,
M.A.(Counseling Psychology)
Member

Chukiat Viwatongkasem

.....
Assoc. Prof. Chukiat Viwatongkasem,
Ph.D.(Statistics)
Member

M.R. Jisnuson Svasti

.....
Prof. M.R. Jisnuson Svasti, Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

Phitaya Charupoonphol

.....
Assoc. Prof. Phitaya Charupoonphol,
M.D.,Dip.Thai Board of Epidemiology
Dean
Faculty of Public Health
Mahidol University

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Pornlert Chumchai

THE RELATIONSHIP BETWEEN DRIVING ANGER WORK ABILITY JOB CHARACTERISTICS AND ACCIDENTS AT WORK AMONG TRUCK DRIVERS

PORNLERT CHUMCHAI 4737693 PHPH/M

M.Sc. (PUBLIC HEALTH) MAJOR PUBLIC HEALTH NURSING

**THESIS ADVISORS: PIMPAN SILPASUWAN, Ed.D.(Population Education)
CHUKIAT VIWATWONGKASEM, Ph.D.(Statistic)
TASSANAI WONGSUVAN, M.A.(Counseling Psychology)**

ABSTRACT

Truck drivers have an increasing injury and mortality rate related to accidents at work in Thailand. There are consequences were losses for drivers, family, and country. The purposes of this research were to study the relationship between driving anger, work ability, job characteristics, and accidents at work among truck drivers. The samples were 400 truck drivers, who usually parked on King Rama III road, King Rama II road, and Bang pa-in road. Using stratified random sampling technique, data were collected through interviews from 1st August to 30th September, 2006. Statistical analysis included descriptive, Chi-square test, Paired Sample t-test, and Multiple logistic regressions.

The result showed that 25.5% of the sample had accidents at work, 59.3% had moderate driving anger level, 58.8% had good work ability level, and work ability levels decreased for those over 50 years old, 24.8 % were driving over than 8 hours/day, 60.0% had resting hours driven less than or equal a half hour/day. While, the work ability was significantly related to accidents at work.

Suggestion this finding, that drivers should be pre-screening work ability tested before taking up employment, while in the act of driving and at yearly intervals. Especially, those over 50 years and who have poor to moderate work ability level. Safety in the truck drivers should be improved and emphasized.

KEY WORDS: DRIVING ANGER / WORK ABILITY / JOB CHARACTERISTICS / ACCIDENTS AT WORK/ TRUCK DRIVERS

107 PP.

ความสัมพันธ์ระหว่างความโกรธในขณะขับรถ ความสามารถในการทำงาน ลักษณะงาน กับการเกิดอุบัติเหตุในการทำงานของพนักงานขับรถบรรทุก (THE RELATIONSHIP BETWEEN DRIVING ANGER WORK ABILITY JOB CHARACTERISTICS AND ACCIDENTS AT WORK AMONG TRUCK DRIVERS)

พรเลิศ ชุมชัย 4737693 PPHP/M

วท.ม. (สาธารณสุขศาสตร์) สาขาวิชาเอกการพยาบาลสาธารณสุข

คณะกรรมการควบคุมวิทยานิพนธ์ : พิมพ์พรรณ ศิลป์สุวรรณ, Ed.D. (Population Education)

ชูเกียรติ วิวัฒน์วงศ์เกษม, Ph.D.(Statistics) ทัศนัย วงศ์สุวรรณ, M.A.(Counseling Psychology)

บทคัดย่อ

พนักงานขับรถบรรทุกมีอัตราการบาดเจ็บและอัตราการตายจากการทำงานเพิ่มขึ้น ส่งผลให้เกิดการสูญเสียทั้งต่อผู้ขับ ครอบครัว และประเทศชาติ การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างความโกรธในขณะขับรถ ความสามารถในการทำงาน ลักษณะงานกับการเกิดอุบัติเหตุในการทำงาน กลุ่มตัวอย่างคือพนักงานขับรถบรรทุกที่จอดพักระหว่างตีเวลาห้ามวิ่งเข้าเมืองบริเวณถนนพระราม 2 พระราม 3 และบริเวณทางต่างระดับบางปะอิน จำนวน 400 คน ที่ได้จากการสุ่มแบบแบ่งชั้นภูมิ เก็บรวบรวมข้อมูลโดยสัมภาษณ์กลุ่มตัวอย่างตามแบบสอบถาม ระหว่างวันที่ 1 สิงหาคม ถึง 30 กันยายน 2549 การวิเคราะห์ข้อมูลด้วยโปรแกรมคอมพิวเตอร์โดยใช้สถิติเชิงพรรณนา และทดสอบด้วย Chi-square test, Paired Sample t-test และ Multiple logistic regression

ผลการศึกษาพบว่า ร้อยละ 25 ของกลุ่มตัวอย่างเกิดอุบัติเหตุจากการขับรถ ความโกรธในขณะขับรถ อยู่ระดับปานกลางร้อยละ 59.3 ความสามารถในการทำงานอยู่ในระดับดีร้อยละ 58.8 และพบว่าพนักงานขับรถที่มีอายุมากกว่า 50 ปี ความสามารถในการทำงานลดลง จำนวนชั่วโมงการขับรถมากกว่า 8 ชั่วโมงต่อวัน ร้อยละ 24.8 จำนวนชั่วโมงการพักระหว่างขับรถน้อยกว่าหรือเท่ากับครึ่งชั่วโมงต่อวันมากที่สุด ร้อยละ 60.0 ในขณะที่เดียวกันพบว่าความสามารถในการทำงานของพนักงานขับรถบรรทุกมีความสัมพันธ์อย่างมีนัยสำคัญกับการเกิดอุบัติเหตุ การขับรถ

จึงมีข้อเสนอแนะให้ประเมินระดับความสามารถในการทำงานของพนักงานขับรถบรรทุกก่อน และระหว่างเข้าทำงานประจำปี โดยเฉพาะอย่างยิ่งกลุ่มที่มีอายุมากกว่า 50 ปี และกลุ่มที่มีระดับความสามารถในการทำงานระดับต่ำ และปานกลางควรปรับปรุง และให้เพิ่มความตระหนักถึงความปลอดภัยในการทำงาน

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CHAPTER I

INTRODUCTION

Background and Significance

The 1st - 9th Social and Development Master Plan states that development of an economy depends on the development of industry such as construction, industry production, mining, forestry and transportation. Of Thailand's 68.58 million, 35.61 million are part of the labor force.(National Statistical Office,2006). Workers develop the processing of goods and services in response to the needs of the population. A negative consequence of labor work is accidents at work. There are two types of loss from accidents at work. The first is direct loss, such as medical expense, funeral expense, and reimbursement for the employee who has had an accident at work. The second is indirect loss, such as the effect on the image of employers and employees, the lack of warm in family and the lack of security in the country (Chaikittipron, C. 2001: 45).

Fatal road accidents are increasing worldwide. Statistics shows an injury rate of 1.2 million / year. In the USA, truck drivers are the group with the highest injury rate, at 141.1 per 1,000 of the population. A survey of occupational injuries and illnesses showed that laborers had injury and property damage caused by road accidents (Fred, 1999:14).

Accidents caused by drivers driving vehicles and work related diseases are increasing in Thailand. The prevalent rate of general vehicle accidents in 2002 - 2003 was 5,102, mortality rate was 392, disability rate was 6, and loss of an organ was 83 per 100,000 of the population (Bureau of Epidemiology, 2005). Accidents at work among professional drivers were the most damaging.

At present, the Ministry of Labors' safety and working environment laws regulate employees, employers and others. There are laws which control employees and employers working conditions related to safety measure in the working, in order to management of safety for zero injury, reduce injury disability, death along with work

related disease. Employees and employers collaborate in planning safety management. Teams regulating the laws within the workplace are made up of staff from disciplines such as safety officers, occupational health doctors and occupational health nurses (Montawun, N. 2005:10). Occupational Health Nursing is important in maintaining health and safety among workers in the workplace. Their role includes making health assessments, health promotion and prevention, treatment and rehabilitation.

In 2005, there was a total of 667,657 truck drivers per million of the population. According to the Department of Land Transport (2004), truck drivers are a large important group of laborers in the delivery and receiving of cargo in Thailand. According to the Institute of Epidemiology of Thailand, during 2003 - 2005, truck drivers have been involved in approximately 7.0%, 6.1% and 8.7% of all accidents and the mortality rate was 1.8%, 1.6% and 1.6%, respectively. Surprising, the mortality rate in accidents involving truck drivers is significantly higher when compared with other drivers, and they experience more severe injuries and property damage.

The accident theory of Brid & Germain 1992 cited by McKinnon (2002: 84-87) explained that an accident was an immediate uncontrolled situation when working, which can result in injury, loss of productivity and workplace property, Furthermore, the theory defined causes of accidents as (1) unsafe acts, such as not following the law, inappropriate dress at work, and carelessness (88%), (2) unsafe conditions, such as hot or cold air, dust, and noise (10 %) and (3) other, such as management of safety systems of work and natural disasters (2%). Interestingly, the working processes are increasing effected to accidents at work.

Work consists of three dimensions (1) the person (2) the process of work and (3) the environment. These dimensions interact among each others (Kaewboonchu, O. 2004: 20). Considering the truck driver, the personal dimension includes gender, age, education, beliefs, personality and human behavior. The process of work dimension includes tray driving for delivering and receiving cargo. The environmental dimension includes (1) the physical environment, namely light, sound, temperature, the road condition, vehicle condition, and location of driving, (2) the biological environment, namely microbes, (3) the chemical environment, namely oil, fuel and (4) the psychosocial environment, namely management policy.

Related researches have studied interpersonal factors, workplace safety, health status, well-being, working condition, and environment factors to accidents at work. The result showed as follows:

Personal factors such as gender, age, education, and behavioral factors such as drinking and driving, use of amphetamines, non use of safety belt and driving experience were related to accidents at work (Ruttanasutjatam, K.,1996: 45-60; Romsai, C.,1991:40-45; Singsri, D.,1999:9-10; Witiyakomon, R.,2001:20-50). Moreover, accidents at work were related with unsafe acts factors which were physical health conditions, hearing loss, eyesight loss, illnesses and weakness, and mental health conditions, loss of consciousness, loss of concentration, and lack of control of emotions, such as excitement, fear and anger.

Anger is a negative, phenomenological feeling associated with specific cognitive and perceptual distortions and deviances and the change between the cognitive domain and aggressive behavior (Spielberger, et al.1996:6-7). Individual differences in the propensity to become angry, while driving contributes to the phenomenon of angry drivers and anger and cognitive processes, may disrupt perception and information processes necessary for safe driving (Deffenbacher, et al., 2003: 715-718). Bureau of Epidemiology(2005) found that personal factors were related to fatal road accidents approximately 82% of the time. Boonyahotaro, V.(1982: 20-30), Singsri, D.(1999:10-20); and Bureau of Epidemiology (2005) indicated that drivers higher risk of accidents were aggressive driving and speeding.

Several studies about traffic and transport psychology have shown anger and aggressiveness have an important effect on driving performance and indicated that safety on the road is associated with emotions (Matthews & Desmond, 1995, cited in Underwood, 1999:56). Deffenbacher, and et al. (1994:81-93) speculated that the anger experienced while driving might affect safety in various ways. Anger might influence motivation to commit various risky driving behaviors such as tail-gating, speeding, rapid lane-switching and flashing lights that in turn may increase accidents during the emotional episodes. Interestingly, the relationship between emotional factors and accidents at work has not been studied in Thailand.

Working condition factors consist of three of work process dimensions including (1) workers, material, machines, (2) work and (3) workplace

station.(Silpasuwun, P.2001: 159 - 160). Truck drivers use machines to transport cargo. Job characteristics of truck drivers include work scheduling, the number of days worked, the hours driven, day and night driving and the number of breaks taken (Kauwboochu, O. 2004: 33). Job characteristics inappropriate for physical and psychosocial health were related to fatigue that can lead to road crashes (Sabbagh, et al., 2005: 110 – 114; Helina & Heikki, 2001:190-196).Truck drivers use physical and mental facilities and are mobile on the road all time. It is possible that this increases the risk of accidents (King Mongkut's University of Technology Thonburi, 2005). Several studies have reported that there was increased the risk of accident in truck drivers after driving for prolonged distances and hours. Truck drivers who had driven more than 12 hours were involved in more crashes with injuries and death and the crashes were related to driver fatigue (Sabbagh, et al.,2005: 110 – 114, Julie & Andrew, 2003:770-779; Feyer & Williamson, 2001:230-235). The truck drivers' salary and competitiveness within the occupation motivates drivers to make the maximum number of trips per day and work day and night. Jarearut, Y.et al. (2003:3) states that the pay system per trip motivating truck drivers to drive prolonged hours to make money could lead to physical weakness.

The environmental factors refers to everything surrounding the workplace, including (1) the physical environment, such as sunlight, sound, temperature, road condition, geographic region, and the weather (2) the biological environment, such as microbes, (3) the chemical environment, such as fumes, carbon monoxide and oil pollution and (4) the psychosocial environment, such as work related diseases, stress, relationship between employer and employee, the workers role and responsibility (Singsri, D. 1999:20-30, Barry & Wegman. 2000:80 -120). Environment factors have been shown to be related to accident on road. Road accidents are a combination of personal factors, work and environment.

Regarding the personal factors aspect, it was found that psychology factors namely work ability was related to safety in working. The work ability concept is a new concept. It refers to how good a person works is at present and in the near future, and how able the person is to do the work with respect to work demands, health, and mental resources. This concept has been developed from the stress - strain model (Ilmarinen, 1998 cited in Khaebunchoo, O., 2003). The work ability concept consists

of 7 items those are (1) current work ability compared with the lifetime best, (2) work ability in relation to the demands of the job, (3) the number of current diseases diagnosed by physician, (4) the estimated work impairment due to diseases, (5) sick leave during the past year (12 months), (6) the workers own prognosis of his/her work ability two years from now and (7) the workers mental recourses.

Work ability has been used in the study of physical workers (construction laborers, cleaners), mental workers (administrators, supervisors, managers), physical / mental workers (nurses, drivers). Results showed that the work ability index is an appropriate and effective measure of work ability. However, this concept has only been related to safety and not specifically to accidents at work (Ministry of Social Office O.H.S.1999 cited in Ilmarinen, 2005:61).

As described above, accidents at work among truck drivers may be caused by the interaction of many factors. The domino theory of accidents models an accident as 5 domino pieces. If any event leads to step 1, it will trigger the following steps respectively, just like a series of dominos, until the last step, which is an injury (Heinrich, 1992 cited in Mckinen, 2000:84-87; Shakin, 2004:191-198).

The Occupational Health Nursing has many responsibilities including health promotion, health prevention, treatment and rehabilitation of workers. Accidents at work are a severe problem with a high risk of injury and fatality. The researcher is an Occupational Health Nursing. Therefore, this study explored the possible relationship between personal factor of drivers, working condition of driving, environmental of driving, and accidents at work and whether any interaction can predict accidents at work among truck drivers. More specifically, this study focuses on the relationship between driving anger (Spielberger, et al.1996; Deffenbacher, et al.,1994) work ability (Ilmarinen.2005), and job characteristics such as distance driven, hours driven, number of trips, resting hours driven and workplace driven and accidents at work. This study explores causal factors affecting the rate of accidents and makes suggestions about how the new found knowledge could be applied to promoting road safety among truck drivers.

Research problem

1. What are the demographics, driving anger, work ability, job characteristics, and accidents at work among truck drivers?
2. Is there any relationship between driving anger, work ability and job characteristics with accidents at work among truck drivers?
3. Can driving anger, work ability and job characteristics predict accidents at work among truck drivers?

Research objectives

1. To study the demographics, driving anger, work ability, distance driven, hours driven, number of trips, resting hours driven, and workplace driven among truck drivers.
2. To examine the relationship between driving anger with accidents at work among truck drivers.
3. To examine the relationship between work ability with accidents at work among truck drivers.
4. To study the relationship between job characteristics (distance driven, hours driven, number of trips, resting hours driven, and workplace driven) with accidents at work among truck drivers.
5. To study predicting factors between driving anger, work ability, distance driven, hours driven, number of trips, resting hours driven and accidents at work among truck drivers.

Research hypotheses

1. Driving anger relate to accidents at work among truck drivers.
2. Work ability relate to accidents at work among truck drivers.
3. There is a relationship between job characteristics and accidents at work among truck drivers.
 - 3.1 There is a relationship between distance and accidents at work among truck drivers.
 - 3.2 There is a relationship between hours driven and accidents at work among truck drivers.

3.3 There is a relationship between number of trips and accidents at work among truck drivers.

3.3 There is a relationship between resting hours driven and accidents at work among truck drivers.

3.5 There is a relationship between workplace driven and accidents at work among truck drivers.

4. Driving anger, work ability, distance driven, hours driven, number of trips, resting hours driven, and workplace driven can predict accidents at work among truck drivers.

Variables in this study

Independent variables comprised of

1. Driving anger.
2. Work ability.
 - 2.1 Current work ability compared with the lifetime best.
 - 2.2 Work ability in relation to the demands of the job.
 - 2.3 Number of current diseases diagnosed by physician.
 - 2.4 Estimated work impairment due to diseases.
 - 2.5 Sick leave during the past year (12 months).
 - 2.6 Own prognosis of work ability two years from now.
 - 2.7 Mental resources.
3. The job characteristics.
 - 3.1 Distance driven.
 - 3.2 Hours driven.
 - 3.3 Number of trips.
 - 3.4 Resting hours driven.
 - 3.5 Workplace driven.

Dependent variables are

Accidents at work.

1. No accidents at work.
2. Accidents at work.

Scope of study

This study focused only on truck drivers involved in agricultural and industrial transport in Bangkok and other provinces. They were stopped around 15.00 - 21.00 PM on Monday to Friday, 1 August to September 2006 in three areas (King Rama II road, King Rama III road, and Bang pa-in road).

Definition of terms.

1. Truck drivers.

Truck drivers refers to drivers that drive trucks with more than ten wheels and transports agricultural and industrial products in Bangkok and other provinces.

2. Driving anger

Anger can be seen as meaning a negative, phenomenological (or internal) feeling associated with specific cognitive and perceptual distortions and deficiencies (misappraisals, errors, and attributions of blame, injustices, preventability, and / or intentionality, subjective labeling), physiological changes, and action tendencies to engage in socially construed and reinforced organized behavioral scripts (Spielberger, 1996 cited in Wongsuvan, V, 2002:49-50). In this study, driving anger refers to the perceptions or feeling about situations while driving a truck. Situations were rating scale using a driving anger scale questionnaire. The researcher developed the questionnaire based on the driving anger concept (Deffenbacher, et al., 1994:83-91).

3. Work ability

Work ability means the capacity of a person in their work at present and in the near future. In other words, how he / she is able to do his / her work with respect to work demands, health, and mental resources. In this study work ability refers to the perception or feeling about capacity to work related to health, competence, values and work environment of truck drivers. The researcher developed the questionnaire based on the work ability index concept (Ilmarinen, 1998 cited by Khaebunchoo, O.2003) and consisted of 7 items:

1. Current work ability compared with the lifetime best.
2. Work ability in relation to the demands of the job.

3. Number of current diseases diagnosed by physician.
4. Estimated work impairment due to diseases.
5. Sick leave during the past year.
6. Own prognosis of work ability two years from now.
7. Mental recourses.

4. Job characteristic

Job characteristics include conditions of working or process of work, and consist of administration of work schedule, time of work, hours of work, shift work and over time (Wongjareanyong, S., 2004:50-60). In this study job characteristic means distance driven, hours driven, number of trips, resting hours driven, and workplace driven among truck drivers, as follows

1. Distance driven per day (measured in kilometers per day).
2. Hours driven per day (measured in hours per day).
3. Number of trips per day (measured in trips per day).
4. Resting hours driven (sleeping, eating, toileting) (measured in hours per day).
5. Workplace driven (measured as region of driving such as Bangkok and Metropolitan, Central, North, South, Northeast, East, and West region).

5. Accidents at work

Accidents at work mean a non predictable event while at the workplace. They may lead to injury, disability or death and loss of property (Brid & German, 1992 cited in Mckinen, 2000:84-87). In this study, accidents at work refer to unpredictable events of truck drivers while driving. There may be direct and / or indirect effects, such as physical or mental health injury and property damage, such as loss of money, loss of vehicle and loss of income and assessment in four categories, as follows (1)near miss accidents, (2)property, (3)minor injury, and (4)serious or major injury.

CHAPTER II

LITERATURE REVIEW

This study examines the relationship between driving anger, work ability, job characteristics, and accidents at work in truck drivers. Here is a review of related literature, divided into the following topic

1. Truck drivers.
2. Concept and theory related to:
 - 1.1 Accidents at work.
 - 1.2 Anger.
 - 1.3 Work ability.
 - 1.4 Job characteristics.
 - 1.5 Occupational Health Nursing
3. Other research

2.1 The life style of truck drivers

It is stated in the 1st – 9th National Economic and Social Plan that development of the economic system effects industry in Thailand. Transportation systems allow supply and demand needs to be met with the efficiently and quickly. For truck drivers, it is very importance to receive and deliver cargo. A survey found there were 667,657 truck drivers in 2005(Department of Land Transport, 2005). This showed that truck drivers are a large labor group who are very important to the development of the economic system in Thailand.

Demographic data of truck drivers show that their average age is approximately 30 -39 years (Srireacha, P., 1999:Abstract; Pongpanud, K., 1995: Abstract; Aegejareykul, P., 1995: Abstract) and most of them are male (Pongpanud, K.1995: Abstract). All of them had a primary school education (Srireacha, P.1999: Abstract). Some had a secondary school (Aegejareykul, P.1995: Abstract). Most of them had a income average of 3,000 – 4,490 baht per month (Srireacha, P.,

1999:Abstract; Aegejareykul, P., 1995:Abstract). Most of them had more than 5 years experience driving (Srireacha, P., 1999:Abstract). Some of them had more than 8 years experience driving (Kasadwisad, H., 2001: Abstract; Aegejareykul, P., 1995:Abstract). Most of their driving was in the Northeast. With respect to the life style of truck drivers, Jareayrud, Y.et al, (2004:3-17) found that truck drivers made two types of trips, (1) many short journeys, and driving morning to evening within provinces and (2) long distance driving, with 2 - 3 days per trip and driving between provinces.

The life style of truck drivers put them at high risk of work accidents. From 2001–2004, truck drivers had 1.8, 1.6 and 1.6 accidents per 1000 and there were 7.0, 6.1 and 8.7 deaths per 1000 (Bureau of Epidemiology, 2005). This shows that there is a high rate of driver accidents at work, leading to disability, death and loss of property.

2.2 Concept of an accident

There are several definitions for the term accident. One definition is an event which is sudden and not predicable and an accident at work means an accident at the workplace which results in loss of payment (Yuearod, W.1999:94). A second definition of an accident at work is an event that can not be predicted or controlled at the workplace or in another place that is due to work, resulting in stopped work, injury, disability, death and/or loss of property.

Heinrich (1992 cited in Wutcharapiyanun, S., 2003:11) explained that accidents are injury and/or loss of property and that the accident is composed of three factors, (1) the environment, (2) physical problems such as small physique or a disability, and mental problems such as anger or stress, (3) unsafe acts and unsafe conditions that are sources of accidents. These many factors related to accidents at work are diagrammatically compared. The accident model is illustrated on the following page:

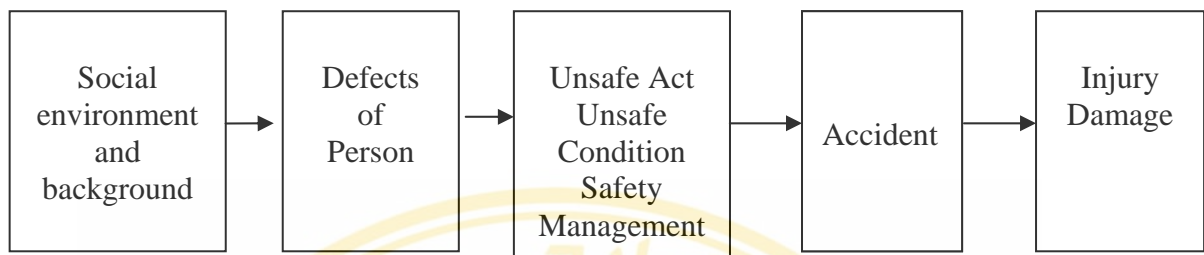


Figure 1: The Heinrich model of accident

This domino theory of accidents has 5 domino pieces are;

1. Individual background, including physical and mental health or chronic disease affecting work
2. Individual deficiencies such as lack of experiences
3. Unsafe acts or unsafe condition and safety management
4. Accident
5. Injury or damage

Bird and German (1974 cited in Makinnon 2000:80-84) developed a model of an accident from the domino theory. It stated that accidents are events which are dangerous to people and cause loss of property. A summary of this theory is as follows:

1. The loss refers to loss of property or person health. The severity level is related to the effect of event and the on going process such as first aid emergency and practice following the emergency.
2. Incident / contact refer to the loss event resulting in the transportation of energy from person or material.
3. Immediate cause refers to the conditions intermediately around the event, including unsafe acts or unsafe conditions.
4. Basic causes refer to the individual background and prolonged unsafe conditions. Basic causes can be divided into personal and workplace.
5. Loss of control refers to the policy administrated for accident control, including organizing, planning, leadership and control.

Cause of accidents

1. Basic or contributing causes of accident are:

1.1.1 Supervisory safety performance

1. Safety instruction inadequate.
2. Safety roles not enforced.
3. Safety not planned as part of the job.
4. Infrequent employee safety contacts.
5. Hazards not corrected.
6. Safety devices not provided.

1.1.2 Mental condition of person.

1. Lack of safety awareness.
2. Improper attitude.
3. Slow mental reaction.
4. Inattention.
5. Lack emotional stability.
6. Feelings are to fear, to timid, and to take fright.

1.1.3 Physical condition of person.

1. Extreme fatigue.
2. Physically unqualified for job.
3. Past history illness such as deaf, heath diseases, poor eyesight. These are souses to direct accident at work.

1.2 Immediate causes of accident are:

1.2.1 Unsafe acts.

1. Protective equipment or guard provided but not used.
2. Hazardous method of handling (failure to allow for sharp or slippery objects and pinch point, wrong lifting, loose grip, etc).
3. Improper tools or equipment used although proper tools were available.
4. Hazardous movement (running, jumping, sleeping on or climbing over, throwing, etc.)
5. Horseplay.

1.2.2 Unsafe acts condition.

1. Ineffective safety device.

2. No safety device although one is needed.
3. Hazardous housekeeping (material on floor, poor piling, congested aisles).
4. Equipment, tools, or machines defective.
5. Improper dress or apparel for job.
6. Improper illumination and ventilation.

2.3 Concept of anger

Anger

Anger can be seen as meaning a negative, phenomenological (or internal) feeling associated with specific cognitive and perceptual distortions and deficiencies (misappraisals, errors, and attributions of blame, injustices, preventability, and / or intentionality, subjective labeling), physiological changes, and action tendencies to engage in socially construed and reinforced organized behavioral scripts (Spielberger, 1996 cited in Wongsuvan, T., 2002:7).

Constructs and a working model of anger

Delineating meaningful clinical anger disorders is confounded by the long established tendency to use related concepts interchangeably (Spielberger, 1988, Ressel & Crane 1983 cited in Deffenbacher, 1996:80-150). This conceptual confusion may be reduced if terms and concepts are anchored in one or more of three dimensions.

First, a concept may be defined in terms of the response system(s) involved. That is, human experience may be broken down into four correlated, yet distinct response dimension: cognitive, affective (phenomenological), physical, and behavioral. The cognitive element refers to encoding and information-processing styles and includes concept such as attention and scanning, attributions, attitudes, concept accessibility and memory, emotional scripts, self-talk, imagery, and the like. The affective component refers to the phenomenological, and behavioral subjective experience of specific feelings that one actively labels and identifies. The physiological component refers to changes in skeleton facial muscle autonomic arousal, and adrenal and other endocrinal changes. The behavioral dimension

encompasses overt motor behavior and verbal forms of expression. Deference anger-related constructs often refer more to one response parameter than another.

Second, constructs can be defined in terms of their dispositional or momentary referent. A term may refer to the way an individual habitually tends to think, feel, and behave (a dispositional or trait referent), or to how a person is thinking, feeling, and behaving at a given moment or over a short period of time (a momentary or state referent).

Third, although it may be somewhat artificial in some cases, reactions (and the concepts describing them) can be described in terms of how situation- or context-bound they are. Some reactions appear to be relatively situation-specific and occur primarily in the presence of specific environmental cues or conditions. Other reactions seem more generalized and cut across a wide range of situations; the individual simply seems more prone to anger and irritability (i.e., high on trait of general anger). This does not indicate that the individual is angry all the time, but only that anger experiences have generalized across many situations and are experienced more intensely for a longer duration.

In describing a specific anger episode (state anger), the outcome emerges from complex interactions among: (a) one or more prompting conditions; (b) the individual pre-anger state, including momentary and enduring characteristics; and (c) the appraisal process (Deffenbacher, et al.2002:25). In this sense, anger is one type of an internal experience or response. It consists of physiological, cognitive, and phenomenological components that rapidly interact and influence each other, and that generally appear in a simultaneous manner such that the individual experiences them together as anger.

Anger prompts

Anger is often elicited by one or more of three classes of stimuli. Occasionally, anger appears to be triggered by an identifiable event and clumsiness. A second source is the anger-laden memories and internal image that are triggered by an external cause.

Pre-Anger Characteristic.

Intense or otherwise dysfunctional anger often develops from rigid and highly extended boundaries to the personal domain. Preferences are no longer personal and flexible guideline for behavior, but become dictatorial commandments of self and others. Values and commitments become imperatives, rather than things about which the person deeply cares, but in which shortcomings can be tolerated. Agreements and expectations become inviolate decrees rather than meaningful but tentative contracts and promises. Things with which the individual identified or involved in, become sanctified and off limits to negative event, rather than as experience that naturally, although undesirably, There are occasionally difficult or bothersome. The individual views goals an end unto themselves, rather than as a desired outcome. Goals must not be blocked or stymied, and the person has little tolerance for frustrating, goal-blocking events. Anger eventuates when any of these rigidly, and often arbitrarily, defined parameters are violated.

Appraisal process

Anger is not an automatic reaction; potential provocations are appraised through dispositional tendencies, temporary physical- emotional- cognitive status, and temporary characteristics of the situation. Primary appraisal (Lazarus, 1991 cited in Deffenbacher, 1995: 32) involves an evaluation of an event and its context in terms of its potential relevance and threat or harm value. Anger is unlikely if the event is appraised as relevant and as a trespass on the personal domain, a violation of expectations or freedoms, and/or an interference with goal-directed behavior.

Secondary appraisal processes involve a judgment about the person's coping capacities, rather than the precipitating condition. Anger is not likely to eventuate if the individual perceives him- or herself as possessing adequate coping skills.

Model of anger

The factors that have influence anger are:

1. Biological permanent factors, such as genetics and emotions
2. Semi biological factors such as range of age difference, such as someone with a bad experience when young.

3. Events such as drug use and alcohol drinking.

The process of anger and aggressiveness can be summarized as the following:

Stage I: Event has stimuli, which is a negative event, such as not being invited to a meeting or someone insulting you.

Stage II: Response with negative feelings, which are expressions of behavior to an old event and which has been learnt from observation and modeled (Kassinove & Eckhardt 1995 cited in Wongsuwan, T., 2001:13). The anger is related to consistent thinking, automatic nervous system, face expression and speech.

Level of anger

Anger can range from annoyance to rage (Spielberger et al., 1995:52). A person can cope with annoyance by considering the event and constructing a new outcome. When the feeling can be dealt with, the individual can enter normal life. But if a person can not overcome the negative feeling, the anger becomes more severe.

Result of anger

The person who has a tendency towards anger often experiences this emotion more intensely, together with negative consequences that tend to come.

Experience of anger

Anger can be divided into two types, state and trait anger.

- State anger is a condition with physiological automatic nerve system and psychology components and ranges from irritability or annoyance to severe anger.

- Trait anger is characterized by a person with frequent responses of annoyance or irritability to stimuli and who has anger over time.

The anger model

Attitude, mental status, and mood status are related to driving. Vehicle condition and environment also has an effect. Driving behavior includes aggressiveness and politeness. Review of the literature suggests that recurrent accidents have an origin in mental health problems.

When considering work place psychology, anger can be triggered in such a way as summarized below.

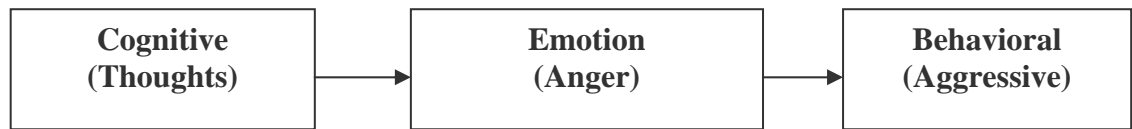


Figure 2: The anger model

This diagram shows the relationship between thinking, anger and behavior (Peter, 2003: 98).

The relationship between anger during driving and accidents

An issue of importance to traffic and transport psychologists is the possible affect that anger and possible subsequent aggression has on driving performance and ability. Especially, in the safety aspects associated with such emotions. Whereas emotions such as anxiety, depression and stress are widely acknowledged as having a detrimental effect on cognitive performance, the cognitive and behavioral effect of driving anger have received relatively little attention (Matthews, et al., 1995; Davies & Debney, 1989 cited in Underwood & Peter, 1999:56). Deffenbacher and et al., (1994:83-91) speculate that anger experienced while driving might affect safety in various ways. Referring to the large body of literature devoted to the emotion-cognitive performance relationship, Deffenbacher and et al. (1994:83-91) postulate that anger might influence motivation to commit various risky driving behaviors that in turn may increase accident liability during the emotional episode. For instance they claim that anger experienced while driving might predispose an individual to engage in dangerous driving behaviors such as tailgating speeding or flashing their lights.

Studies as early as the 1960s have identified a relationship between aggression and accident involvement. Schuman et al. (1967 cited in Underwood & Peter 1999:56) found an association in young drivers between violent history and accidents and becoming involved in physical aggression. Buss and Durkee (1957 cited in Underwood & Peter 1999:56-57) found individuals with violent tendencies scored highly on a questionnaire assessing driving aggression. Similarly, Wilson and Jonah. (1988) cited in Underwood & Peter, 1999:56-57), Dahlen and Martin (2005:341-342) found the relationship between risky driving and aggression driving. They looked at individual's accidents and violent histories and found them to be positively

correlated with scores and subscales of the Buss and Durkee (cited in Underwood & Peter 1999:56-57). It found that inventory related to aggressive tendencies. Selzer and Vinokur (1974 cited in Underwood & Peter, 1999:56-57) found similar results using questionnaires measuring aggression, hostility and accident histories.

Hemenway and Solnick (1993 cited in Underwood & Peter 1999:56-57) found that those drivers admitting to having more altercations with other drivers also tended to have higher accident and violent histories. There is then a well established link between anger questionnaires and aggression and accident involvement. There is however a noted problem within driving research. Maycock, Lockwood, and Lester (1991) cited in Underwood, & Peter.(1999:56-57) found that 25% of accidents were forgotten by their sample of drivers within year. This would be greatly increased for near and smaller accidents. Further more, Underwood,& Peter,(1999:56-57) studying anger while driving in England, found a strong association between the number of near accidents and occasions of anger a person experience during driving. But their results concealed two separate relationships. Near accident frequently provoked feelings of anger, particularly where the driver felt that they were not at fault in the incident. There was also a separate link between the experience of anger in other situations and report of near accidents where the driver was to blame. Such anger also appeared to be linked to mild social deviance and the commission of driving violations.

2.4 Concept of work ability.

Definition of term work ability

Person's work ability is how good their present work and how he/she is able to do his/her work with respect to work demands, health, and mental resources Imarinen, 2005).

The work ability index is a product of research meant for practical use in occupational health care as an aid to helping maintain work ability. It depicts the worker's own assessment of his or her work ability. It's no space agreement with the results of clinical examinations has proved to be good Eskelinen and et al. (1991 cited in Ilmarinen, 1998). In large follow-up studies of the Finnish Instituted of Occupation Health the work ability index has also reliably predicted changes in work ability in different occupational groups.

The work ability index is meant to support the worker. It can be used at an early stage to help ensure that the correct measures are taken to maintain work ability. The work ability index helps to determine which workers need the support of occupational health care. In this manner optimal conditions can be established to prevent a premature decrease in work ability.

The work ability index is an instrument to be used in occupational health care. It is easy and quick to use, it is reproducible, the results are received quickly, and it can be used for follow – up at both the individual and group level. It's data are confidential, and at the individual level the data are used only for occupational health care purpose.

The work ability index forms the basic for further measures. If needed, occupational health personnel can, in cooperation with the worker, draw up an individual program to help maintain work ability. The professional skill of safety personal and management may be needed to decrease health risk factors at work, and the employers support is needed to ensure any psychological and economic condition. Activities to maintain work ability result in benefits to both the employee and the employer.

Work ability new concept was developed by a Finnish expert in 2005. The work ability has been used as an instrument to assess health status of workers (Ilmarinen, 2005). The study found health, physical capacity, mental and social capacity, psychosocial work environment, flexible working time schedules and regulating own work influences work ability (Ilmarinen, 2005 : 3-7). Factors that influence work ability can be summarized in the following way.

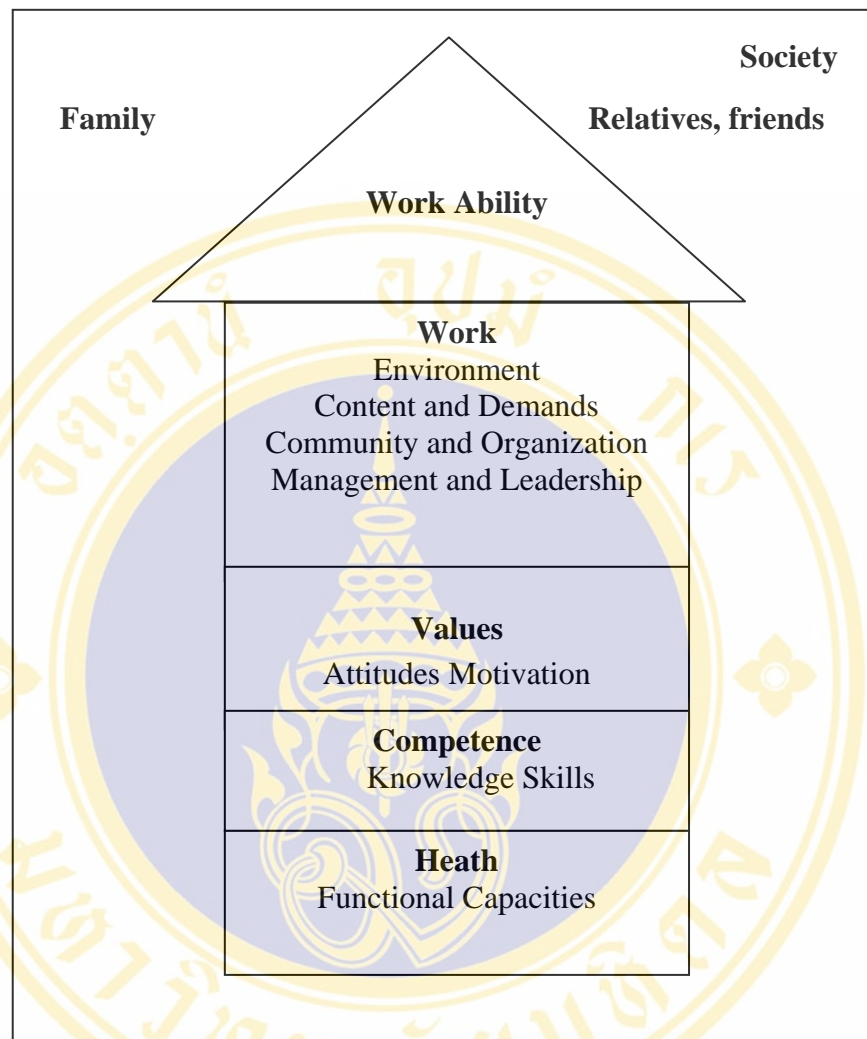


Figure 3: The work ability model.

The assessment of work ability

The instrument to measure work ability is the work ability index. The work ability index is an instrument that can be used in occupational health care. It reveals how well a worker is able to perform his or her work. The work ability index can be used as one of the methods for assessing work ability in health examinations and workplace surveys.

The work ability index is a questionnaire which has 7 items which take into consideration the physical and mental demands of work and the workers health status and resources (Ilmarinen, 1998cited in Khaebunchoo, O., 2003).

1. Current work ability compared with the lifetime best

2. Work ability in relation to the demands of the job
3. Number of current diseases diagnosed by physician
4. Estimated work impairment due to diseases
5. Sick leave during the past year (12 months)
6. Own prognosis of work ability two years from now
7. Mental recourses

The index is determined on the basis of the answers to a series of questions within the above 7 categories. The workers fill out the questionnaire before his or her interview with an occupational health professional, who collects any missing information in consultation with the workers when needed. The occupational health professional rates the responses according to the instructions, the result being a score of 7 - 49. The designated value depicts the worker's own concept of his or her work ability and according to it, the work ability level and the objectives of any measures need to be taken are classified as follows:

Interpret scaling

Scoring of the Questionnaire (7-49)

Points	Work ability	Objective of measures
7-27	Poor	Restore work ability
28-36	Moderate	Improve work ability
37-43	Good	Support work ability
44-49	Excellent	Maintain work ability

The relationship between work ability and accidents at work

The relationship between a person and work in respect to interest, attitude, and interagency, physical and mental health has been studied (Wonganutarod, P., 1993: 61-62). Scottgeller (2001:55-100) states that the psychology of work involves such factors as job characteristic of the person, skills, what work is done and discussion about data for protection from work error and accidents at work.

Workplace safety should focus on health status and wellbeing of the worker and stopping injury at work (Richard, 2002:238). With respect to work psychology,

the concept framework of humanism and behaviorism has importance in the health and safety and accident prevention at work in the following ways:

1. Adaptive behaviors for safe working.
2. Adjust environments at work for safety (process of working, material, machine)
3. Provide resources for directing safety (Laws, master plan, process of work safety)
4. Durable work practices.

The literature related to work ability

Work ability index is an important indicator showing how good a worker is at present and will be in the near future, and how good he / she is at doing his / her work with respect to work demands, health, and mental resources. Finnish Institutional of Occupational Health assessed health status of every occupation using the work ability index. There was screening of (1) physically demanding jobs, such as auxiliary assistants, construction workers, park workers, laborers, and car mechanics, (2) mentally demanding work such as administrative workers, office supervisors, social workers, technical supervisors, physicians and (3) workers who's work combines physically and mentally demanding work such as transport work, machine operators, bus drivers another transport workers, dump site workers, dentists and nurses. The results by Ilmarinen and et al. (1998) reported workers who have an age over 50 years have low work ability because of degenerative physical condition, but because of experience, had cognitive thinking processes related to the work and job enjoyment.

In addition, Kloimuller, Karazman, and Geissler (1999:33-35) studying work ability in bus drivers found that those older than 50 years had low work ability. Capanni and et al. (2005:255-257) studied prospective work ability over fours years among railway construction workers. They compared the work ability trend of workers and found that workers between 40 - 49 years had good work ability and work ability decreased in the 50 - 64 year old group. Kloimuller, Karazman and Geissler(1999:33-35) studying work ability index in bus drivers found that while overall there was good work ability, those over 50 years had a low work ability index. Karazman, Irene and Heinric.(2000:503-511) studying intervention through a health promotion program in

bus drivers by assessing work ability index found that individuals had a higher work ability index score after they were recruited to the program than before they were recruitment. However, the work ability index has some weak points. It focuses on concepts such as safety but does not include concepts such as accidents at work (Ministry of Social Office O.H.S.1999 cited in Ilmarinen, 2005:61).

In Thailand, work ability had been studied indirectly. Srisuriyawong, R. (1994: 89) indicated that older workers had a higher risk of accidents at work than younger workers because of routine work, carelessness and physical ill health.

In addition, Khunjareng, M. (2002:83-86) stated factors, including health status, age, mental health, and stress, were highly related to accidents at work. Singsri, D. (1999:10) found that personality type A and carelessness were highly related to accident risk. In addition, Schulzinger (1985) cited in Srisuriyavad, R., 1994:89-95) found that physical health and mental health status of workers are risk factors for accidents.

Concept and theory about job characteristics of working

Employers often adjust job characteristics for higher productivity, such as increasing time worked and introducing shift work. This can have the effect of increasing accidents at work.

Sabbagh, Friedman and Richter (2005: 110-114) found that in Israel job characteristics were related to fatigue in truck drivers. The drivers drove prolonged hours, with 12 hours during the dayshift and 19 hours during the night shift, with the effect of fatigue, sleepiness and accidents. Julie & Andrew (2003:773) found that hours worked and shift work is related to accidents at work. In addition it was found that in Thailand, a high frequency of industrial accidents were due to working overtime and working over the individuals physical limit, resulting in fatigue. Srisuriyavad, R.(1994:80-90) has found that night shift is more dangerous than day shift because of workers being sleepy.

2.5 Job characteristics of truck drivers

Distance driven

Distance driven refers to the distance cargo is transported. It can be divided into two categories (1) short distance, meaning driving a short time during the morning or evening and driving within the same region and (2) long distance, meaning driving across provinces such as driving between Chonburi and Chiangmai or Ubonratchathani provinces and Bangkok (Jareayrud, Y. and et al., 2003:3-7). Driver's driving different distances behave differently. Those driving short distance rest fewer or not rest and long distance driver's drive all day and night and rest fewer times, so they become physically weaker, which could lead to accidents. Moreover, this finding similar to the result of Feyer and Williamson (1995:234-235). Siriwudtanamatanon, R.(1987:1-2) states that long distance driving is related to crashes. Hataitum, R. (1996:40-60) found that the prevalent rate of accidents when driving more than or equal to 200 kilometers per day was 2.02 more than driving less than 200 kilometers per day. Kasadwisai, H. (1996: Abstract) revealed that driving irregular shifts resulted in fatigue related crashes.

Hours driven

Work hours are important due to their effect on illness, accidents and low productivity. At present, many countries regulate work hours to 48 hours / week. Vicheanchom, V.(2003:48-49) has found that working more than 60 hours / week has a negative effect on product quality and physical strength and an increased frequency of accidents. Prolonged driving has negative effects on a person's life style, including disrupted sleep cycle and eating, psychosocial and relationship problems and gastrointestinal system dysfunction, which could contribute to the cause of an accident.

Number of trips

Truck drivers make different number of trips. Jareayrud, Y. and et al.(2003:3-7) found that the number of trips a driver made was influenced by industry, distance driven, season of production and pay. The wage system is by distance driven. For example, driving between Saraburi and Ubonratchathani pays 700 baht/trips; Chonburi

to Bang pha-kong pays 150 baht/trips. Kunjarey, M.(2005), Jareayrud, Y. and et al.(2003:7) and Kasadwisai, H.(1996:Abstract) illustrated that the pay system motivates truck drivers to make frequent trips. They drive day and night and they use caffeine and amphetamine to overcome fatigue, which can lead to a high risk of accidents. Jareayrud, Y. and et al. (2003:15-17) indicated that drivers speed and compete with time, and this was related to the high risk of accidents.

Resting hours driven.

Rest is important in all occupations. Mclean 2005), The King Mongkut's University of Technology Thonburi(2005) and Griffin.(2005) found that hours of driving, resting hours from driving, and hours of sleep were associated with accidents. Jareayrud, Y. et al.(2003:7), Kasadwisad, H.(1996:Abstract); Pongpanud, K.(1997: Abstract) and Srirecha, P.(1999:Abstract) illustrated that most truck drivers who worked both day and night, did not stop during driving and worked six days a week. Jareayrud, Y, and et al. (2003:15-17) indicated that truck drivers did not stop during driving because they felt it was a race against time.

The nature of truck driving means that drivers should not work more than four hours without a break, because of muscle weakness and job stress. Sareeruk, A. (2001:191-195) and Vicheanchom, V.(2001:62-63) indicated that drivers should stop for at least twenty minutes a time with a total of at least one hour per day. The law states drivers should have at least a half to one hour rest per day. Therefore, drivers who drive around four hours should stop a half an hour in order to relax. Resting can involve, sleeping, eating and the checking of the vehicle.

Workplace driven.

Vehicle accidents by region per 100,000 since 1998 - 2002 found that most accidents occurred in the Central region (5,081) and Northeast region (3,713). Accidents may occur more often in the capital because of the higher number of vehicles. Severe accidents were related to the freeways and different geographic area (Singsri, D.2001:10-30). Suntonruk, P. (1990 cited in Kudchaman, S. 1998:80) indicated that the less traffic on the road was related to accidents because of lack of carefulness and loss of concentration.

2.6 Occupational Health Nursing

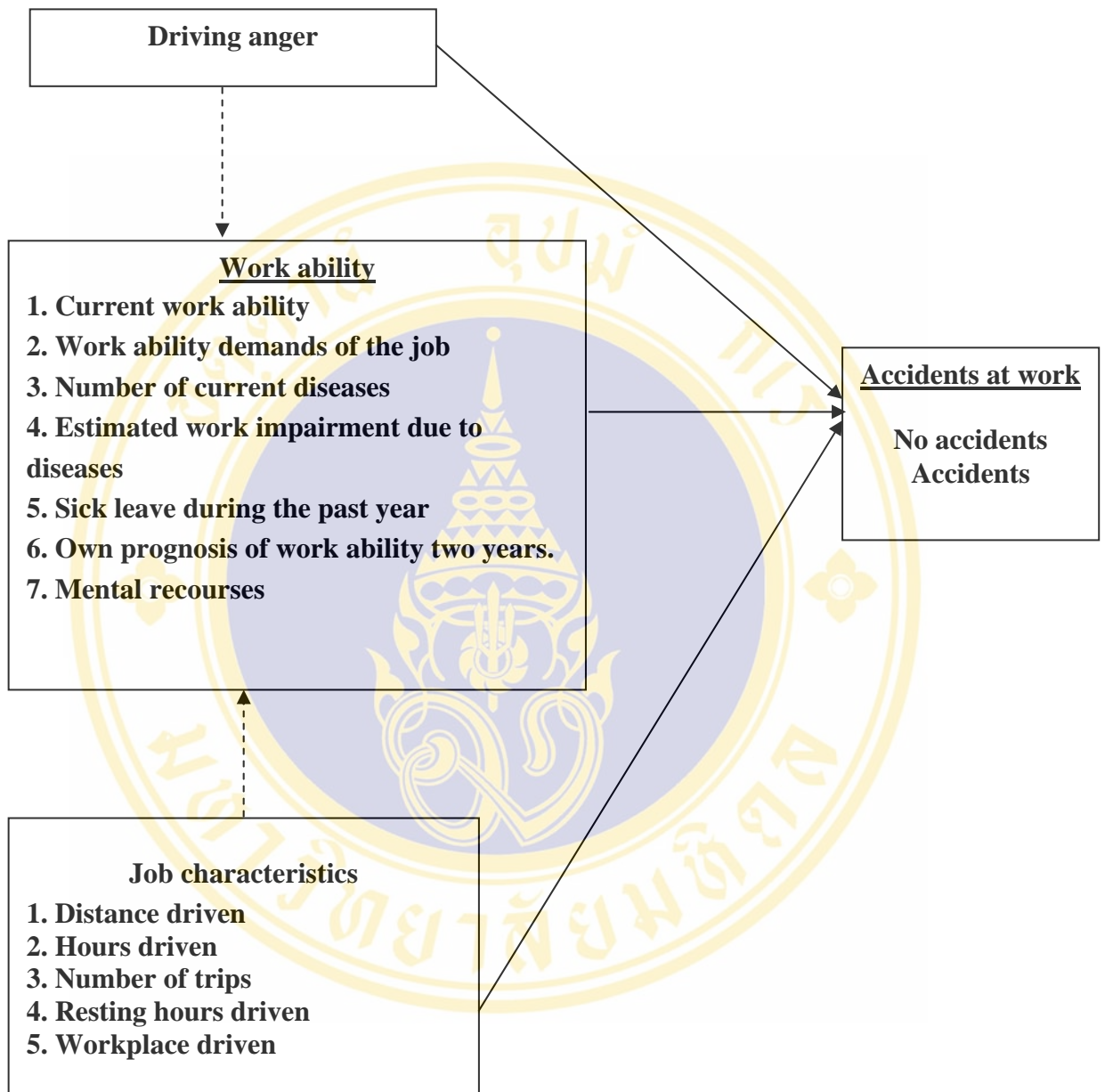
Occupational Health Nursing is a new discipline as specialty of workers in the health system service. It is focus on injury prevention and work-related disease. The target group is workers in the workplace.

2.6.1 Role and functions of Occupational Health Nursing

Role of the Occupational Health Nursing has developed and expanded in the past decade. The principal function continues to be the promotion, protection, and maintenance of the health and safety of workers. The expanded emphasis of occupational health nursing includes wellness and lifestyle changes in addition to the reduction of risks associated with environmental exposure. The practice of this specialty involves primary, secondary, and tertiary prevention. A unique body of skills and knowledge enables the occupational health nurse to provide quality nursing care and services. Special skills include training in safety hazards, disaster planning, familiarity with safety equipment, and the ability to plan, implement, and evaluate health education programs (Rogers, 2003:81-97). Moreover, Occupational Health Nursing has functions to deliver health care services to high risk groups in various workplaces. They conduct research for developing the body of knowledge in Occupational Health Nursing areas and apply research utilizing their practice. Besides, the scientific base in occupational and environmental health is used for improving advance nursing practices and profession nursing at the present time.

Overall Model

All the above mentioned, indicated that there are many causes of accidents such as unsafe acts, unsafe conditions, and other factors especially in safety management in work. The previous studies indicated accidents at work do not happen by one single factor alone, but by many factors. There are few previous studies that support the personal factor of workers affecting accidents at work. In addition, those research findings were unclear on the unsafe condition factor affecting accidents in the workplace as well as a few researches findings found other factors, such as time schedule management and working conditions were related to accident. Therefore, this study intends to explain a new body of knowledge of Occupational Health Nursing by studying factors of accidents at work consisting of personal factors driving anger, working conditions namely hours driven, distance driven, resting hours driven, number of trips, workplace driven, and work ability of the workers among truck drivers. The conceptual framework is illustrated on the following page:



Figures 4: Conceptual framework

CHAPTER III

MATERIALS AND METHODS

Research Design

This research used a cross-sectional survey. The objective of this research was to study the relationship between driving anger, work ability, job characteristics, and accidents at work among truck drivers.

Population and Sample Size

Population

The population of this study was truck drivers who drive agricultural and industrial transport in Bangkok and other provincial areas. There are 3 areas where the drivers were stopped to wait before entering time to Bangkok, including King Rama II road (1,321 drivers), King Rama III road (615 drivers) and Bang pa-in road (3,303 drivers). The total population was 5,239 truck drivers. (From a pilot study between 10 - 17 January, 2006)

Sample Size

The sample size of this study were calculated using a stratified sampling method with proportional allocation (Montree, 1981: 108 - 134, 162 - 164 cited in Silpasuwan, P., 1995 : 191 - 192).

$$n = \frac{N \sum N_h \pi_h (1 - \pi_h)}{N^2 D^2 + \sum N_h \pi_h (1 - \pi_h)}$$

D^2	=	$d^2 / Z_{\alpha/2}$
h	=	strata 1, 2, 3
N	=	size of population
n	=	size of population by Proportional Allocation.
N_h	=	size of population each of strata.
n_h	=	size of sample each of stratified.
π_h	=	proportion of accident at work in stratum h .
d	=	Acceptable Error of Estimation $d = |P - \pi|$

$Z_{\alpha/2}$ = percentile at $(1 - \alpha/2)100\%$ of standard normal curve

$$D^2 = (d / Z_{\alpha/2})^2 = (.05)^2 / (1.64)^2 = .0036$$

N_1	= King Rama II road	1,321 person	$\pi_1 = .36$ (From pilot)
N_2	= King Rama III 3 road	615 person	$\pi_2 = .13$ (From pilot)
N_3	= Bang pa-in road	3,303 person	$\pi_3 = .46$ (From pilot)
	Total of truck drivers	5,239 person	

$$n = \frac{N \sum N_h \pi_h (1 - \pi_h)}{N^2 D^2 + \sum N_h \pi_h (1 - \pi_h)}$$

$$= \frac{5,239(1,320 \times .36 \times .64) + (615 \times .13 \times .87) + (3,303 \times .46 \times .54)}{5,239^2 (.00065071)^2 + (1,321 \times .36 \times .64) + (615 \times .13 \times .87) + (3,303 \times .46 \times .54)}$$

$$= \frac{6,257,313.336}{19,054.20}$$

$$= 328$$

Accordingly, the sample size in this study was 328 truck drivers. In order to prevent sample loss, the number of participants was increased to 394 (20%). To obtain the total in each step, the followed calculation was performed.

From simple size by stratified.

$$n_1 = \frac{N_1}{N} \times n = \left(\frac{1,321}{5,239} \times 394 \right) = 99$$

$$n_2 = \frac{N_2}{N} \times n = \left(\frac{615}{5,239} \times 394 \right) = 47$$

$$n_3 = \frac{N_3}{N} \times n = \left(\frac{3,303}{5,239} \times 394 \right) = 248$$

Sampling Technique

The Stratified Random Sampling technique was used to select the population at 3 areas ($N_1 = 1,321$, $N_2 = 615$, $N_3 = 3,303$). The sample was sampling by using convenient sampling technique from 3 area of sampling framework($n_1 = 103$, $n_2 = 48$, $n_3 = 249$). This is shown in the following diagram:

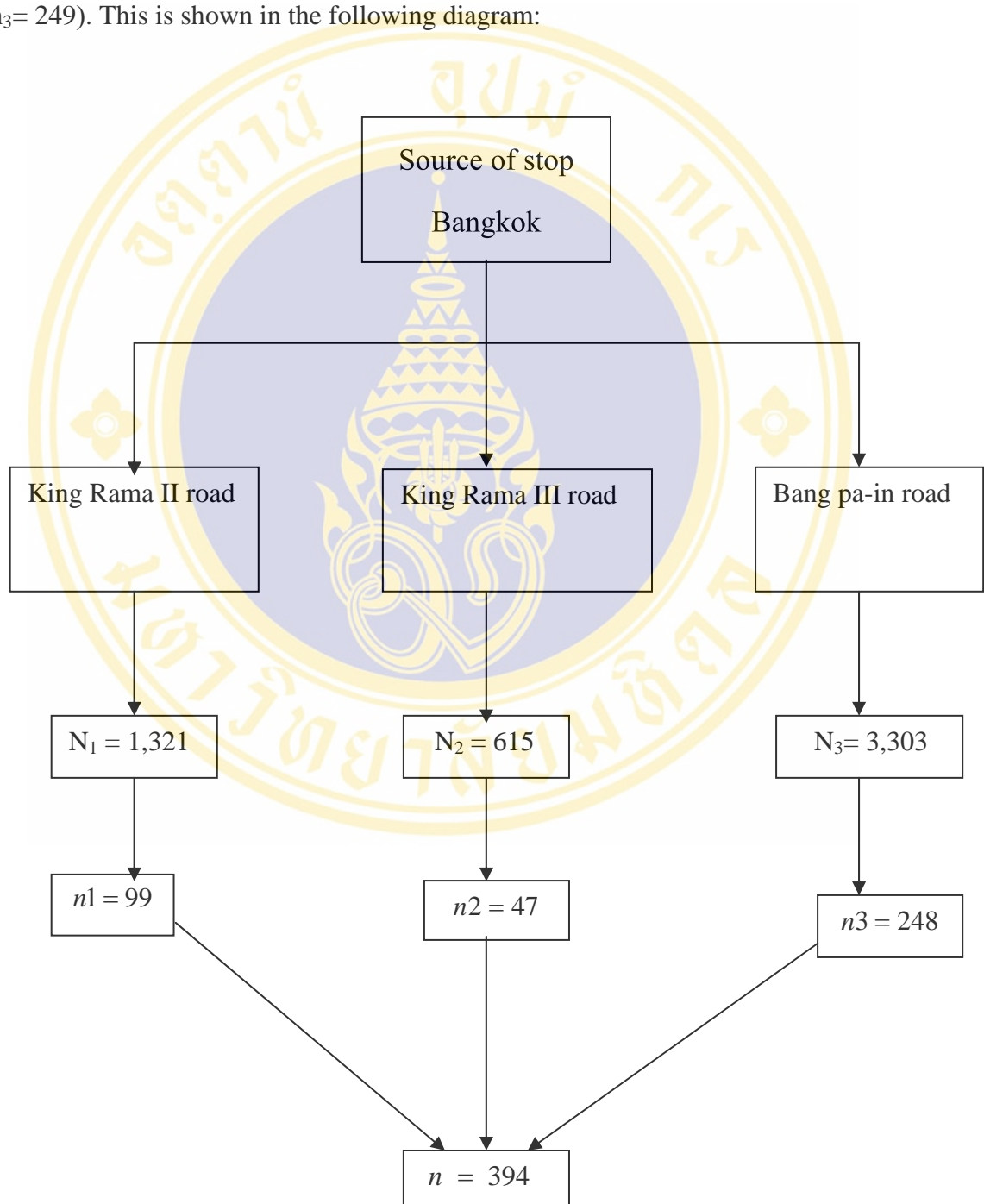


Figure 5: Steps of Sampling Methods

Inclusion criteria of this study

1. Truck drivers who stayed at the truck stop area between 4.00 - 9.00 P.M. Monday to Friday in Bangkok during 1st August - 31st September 2006.
2. Driving experience of at least 1 year.
3. Can read and write Thai language.
4. Voluntarily willing to be a participant in the project.

Research instrument

The structure questionnaires and interviewing technique were used in data collection. The questionnaire was developed from related concepts, theories, research results and advice from academic advisors. It was composed of 5 parts, as follows:

Part 1: Demographic data questions consisting of age, gender, marital status, educational level, income, type of driving, and region of birth.

Part 2: Job characteristics questions. This part consisted of 5 items and included questions about distance driven, hour driven, number of trips, resting hours driven and workplace driven, as follows:

1. Distance driving per day (measured in kilometers per day)
2. Hours driven per day (measured in hours per day)
3. Number of trips per day (measured in trips per day)
4. Resting hours driven (sleeping, eating, toileting) (measured in hours per day)
5. Workplace driven (measured as region of driving such as Bangkok and Metropolitan, Central, North, South, Northeast, East, and West region).

Part 3: Work ability among truck drivers. The questions in this part was developed based on Ilmarinen work ability concept (1998, 2005 cited in Khauboonchu, O., 2003). This part consisted of 7 concepts of work ability as 10 items. The concepts included: (1) Current work ability compared with the lifetime best, (2) Work ability in relation to the demands of the job, (3) Number of current diseases diagnosed by physicians, (4) Estimated work impairment due to diseases, (5) Sick leave during the past year (12

months), (6) Own prognosis of work ability two years from now and (7) Mental resources. These questions were rate-scaled and scored as follows:

Score		Meaning
Points	Work ability	Objective of measures
7-27	Poor	Restore work ability
28-36	Moderate	Improve work ability
37-43	Good	Support work ability
44-49	Excellent	Maintain work ability

Part 4: Driving anger questions among truck drivers. The questions in this part were based on the Driving Anger Scales concept (Deffenbacher, et al.1994:83-91). This part consisted of 14 items related to the Driving Anger Scales. In these questions, the participants rated level of anger experienced if the situation occurred on a 1 - 5 (1 = not at all, 2 = little, 3 = sometime, 4 = much, 5 = very much). The level of meaning and interpreting of score were divided into 3 levels, low, moderate, and high as follows:

Scoring	Meaning
39 – 74	High level
23-38	Moderate level
1-22	Low level

Part 5: Accidents at work questions among truck drivers. The questions in this part were developed based on Brid and Germain accident concept (1992 cited in Mckinnon (2000: 87). This part consists of 2 items, which were accidents at work and no accidents at work. The criteria of accidents at work during 1 year included:

1. Near miss accidents with no injury and no damage to property.
2. Property damage with no injury.
3. Minor injury but can return to work.
4. Serious or major injury has resulting in absence from work 1 day or more.

The method of scoring was accident at work were = 1 and no accident at work were = 0.

The research instrument has been developed from analysis and synthesis of documents and literature reviews about driving anger, work ability, job characteristics,

and accidents at work, and demographics data. Besides, the conceptual framework was used for designing the research instrument.

Validity of the questionnaire

The questionnaire was validated firstly by the main advisor and two co-advisors. The questionnaire was submitted to 5 experts for a check of completeness of the content, clearness of the language, and relevance to the objectives of this study. The experts consisted of one professional in occupational health nursing, one professional in occupational medicine, one professional in occupational health and safety and one psychologist. The questionnaire was improved and adjusted following their recommendations.

Reliability of the questionnaires

The questionnaire was tested with a sample group of 30 truck drivers in a Thai market in Rungsit, who had similar characteristics to the population to be studied. The results were analyzed using the SPSS program to calculate cronbach's alpha coefficient. This figure indicated relevance of content. The reliability of driving anger was 0.77 and the reliability of work ability was 0.68. As the questionnaire obtained results greater than 0.70, it was accepted (Polit & Bernardette, 1997:297).

Ethical Undertaking

The author filled out the form as required by the Graduate Studies to be submitted to the Ethics Committee the No. of IRB MU 2006-109. Upon the Ethics Committee's approval, the questionnaire reliability was tested and revised for conducting the experiment in the actual areas.

Ethical Consideration

1. Complying strictly with risk prevention.
2. Asking for participants' consent to conduct the study, notifying them of research methodology, answering questions about the benefits and issues arising during the experiment.
3. Receiving consent from all participants.

4. Participants having the right to terminate their participation at all times due to any reason.

5. What information about participants, including the first name, last name, and personal characteristics would be published or distributed.

Data collection

The data were collected during August - September 2006. Data collection was conducted in the following steps:

1. Submit the proposal to the ethical committee of graduate studies Mahidol University.
2. Requesting the introduction letter from Mahidol University Graduated Studies department, and sending the sample to describe the research objectives, methods for collection data, usefulness of the study, answer any participant's questions and obtain their consent.
3. The researcher appointed time, place and date for collection of data from the sample.
4. The researcher and the three researcher assistants collected data and used interview techniques with structure questionnaire. The data was collected from 1 August 2006 - 30 September 2006. The area of data collection included King Rama II road, King Rama III road, and Bang pa-in road.
5. Checking completion and correctness of the structured questionnaire answers.

Data analysis

The returned questionnaires were verified for completeness and then coded for analysis. The coded data was keyed in a computer SPSS FOR WINDOWS (Package for Social Science for windows version 13.5) program for the analysis process using the following steps:

1. Descriptive statistics were used to determine demographic data of this sample including frequency, percentage, mean, standard deviation, minimum and maximum.

2. Analytic statistics were used to examine the factors related to accidents at work among truck drivers.

2.1 Chi- square test, Odds ratio, Paired Sample t-test, and p-value were used to measure the crude association between variables.

2.2 Multiple logistic regression analysis was used to find factors predicting outcome and adjusted odds ratio.



CHAPTER IV

RESULTS

This cross-sectional survey study was conducted to explain the relationship between driving anger, work ability, job characteristics and accidents at work among truck drivers. The sample were 400 truck drivers, who were stopped between 15.00 - 21.00 pm at King Rama II road, King Rama III road and Bang pa-in road on Monday to Friday in the Bangkok area. The data were collected by structured interviewing from 1st August - 31st September 2006. The data were checked, coded and analyzed by statistical program. The descriptive statistics used were frequency, mean, standard deviation, maximum, and minimum and the analytic statistics used were Chi-square test, Odds ratio, Paired Sample t-test, and Multiple logistic regression. The results of this study are divided into 3 parts, as follows:

Part 1: The demographics, distance driven, hours driven, numbers of trips, resting hours driven, workplace driven, driving anger, work ability and accidents at work among Truck drivers.

Part 2: The analytic results between driving anger, work ability, distance driven, hours driven, numbers of trips, resting hours driven, workplace driven and accidents at work among truck drivers.

Part 3: Multiple logistic regression prediction between driving anger, work ability, distance driven, hours driven, number of trips, resting hours driven, workplace driven and accidents at work among truck drivers.

Part 1: The demographics, working condition, distance driven, hours driven, number of trips, resting hours driven, workplace driven, driving anger, work ability, and accidents at work among truck drivers.

Demographics.

For almost all of the 400 truck driver's sampled, the average age was 21 - 50 years of age, (39.54 ± 10.1 years). The minimum age was 20 and the maximum was 72 years. About 81.5% of them were married. The educational level included grad 4 (44.8%), grad 6 (28.3%), and only a few had a bachelor degree (0.5%). A majority of the sample (57%) had an income between 5,001 - 10,000 baht per month, the minimum income was 1,000 baht per month and the maximum income was 40,000 baht per month. (Table 1)

Table 1: Number and percentage of sample classified by demographics data

Personal Information	Number	Percentage
Age (year)		
< 20	4	1.0
21-30	80	25.0
31-40	137	29.3
41-50	116	31.5
51-60	58	12.0
> 61	5	1.3
Mean \pm Standard Deviation	39.54 \pm 10.1	
Lowest – Highest	16 – 72 years	
Gender		
Male	399	99.8
Female	1	0.2
Status of Marriage		
Single	61	15.3
Marital	326	81.5
Widowed/separated	13	3.3

Table 1: Number and percentage of sample classified by demographics data
(Continued)

Personal Information	Number	Percentage
Level of Education		
Illiteracy	7	1.8
Primary school grad 4	179	44.8
Primary school grad 6	113	28.3
High school	95	23.8
Diploma / certificate	4	1.0
Bachelor Degree or equivalent	2	0.5
Income (baht)		
< 5,000	42	10.5
5,001-10,000	228	57.0
10,001-15,000	81	20.3
15,001-20,000	34	8.5
20,001-25,000	5	1.3
> 25,001	10	2.6
Mean \pm Standard Deviation	10,754.0 \pm 5,334.2 baht	
Lowest – Highest	1,000 – 40,000 baht	

Working conditions.

The mean length of driving experience was 13.76 years, the minimum was 1 year and the maximum was 54 years. The type of transportation was industrial 92.0% and agricultural 8.0%. The region of birth was the Northeast (45.8%), followed by the Central region (31.0%)(Table 2).

Table 2: Number and percentage of sample classified by working conditions

Personal Information	Number	Percentage
Time of driving (years)		
<10	199	49.7
11 - 20	125	31.3
21 - 30	55	13.8
31 - 40	21	5.3
Mean \pm Standard Deviation	13.76 \pm 10.0	
Lowest – High	1 – 54 years	
Type of transportation		
Agriculture	32	8.0
Industry	368	92.0
Region of birth		
Central	124	31.0
North	23	5.7
South	30	7.5
Northeast	183	45.8
East	26	6.5
West	14	3.5

Job characteristics.

The results of an examination of distance driven showed that the sample were driving \leq 480 kilometer/day (85.3%), between 480 - 720 kilometer/day (7.8%), and $>$ 720 kilometer/day (7.0%).

An examination of hours driven showed that the sample were driving \leq 8 hours/day (75.3%), $>$ 12 hours/day (11.0%), 8 - 12 hours/day (13.8%). Labor laws state driving hours should be 8 hours/day but drivers who have driving prolonged distance can not drive more than 10 - 14 hours/day.

An examination of number of trips showed that the sample was driving \leq 5 trips/day (61.5%) and $>$ 5 trips/day (38.5%).

An examination of resting hours driven showed that most the sample were resting \leq a half hour/day (60.0%), 1 - 4 hour/day (37.5%), and $>$ 4 hours/day (2.5%).

Labor laws states drivers should have at least half to one hour/day resting hours driven.

An examination of workplace driven showed that most the sample were driving in Bangkok and Metropolitan (31.4%) then the Northeast (11.3%).(Table 3).

Table 3: Number and percentage of sample classified by distance driven, hours driven, number of trips, resting hours driven, and workplace driven among truck drivers

Variables	Number	Percentage
Distance driven / day		
≤ 480	341	85.3
480 – 720	31	7.8
> 720	28	7.0
Mean ± Standard Deviation	281.51 ± 290.59	
Lowest – High	16.83 – 1,875 kilometer/day	
Hours driven / day		
≤ 8	301	75.3
8 - 12	55	13.8
> 12	44	11.0
Mean ± Standard Deviation	6.43 ± 7.28	
Lowest – High	.42 – 59.7	hours /day
Number of trips / day		
≤ 5	246	61.5
> 5	154	38.5
Mean ± Standard Deviation	.85 ± .115	
Lowest – High	.04 – 5	trips/day
Rest hours driven / day		
≤ 0.5	240	60.0
0.5 - 4	150	37.5
> 4	10	2.5
Mean ± Standard Deviation	.76 ± 1.14	
Lowest – High	.04 – 8.38	hours /day

Table 3: Number and percentage of sample classified by distance driven, hours driven, number of trips, resting hours driven, and workplace driven among truck drivers (continued)

Variables	Number	Percentage
Workplace		
Metropolitan	127	31.8
Central	97	24.3
North	30	7.5
South	42	10.5
Northeast	45	11.3
East	52	13.0
West	7	1.8

Driving anger.

The results showed with respect to driving anger, drivers who experience moderate levels was 59.3%, drivers who experience low levels of anger was 36.5% and drivers who experienced high level was 4.3%.(Table4). The item analysis of each driving anger scale, found that 92% of sample perceived that none at all of anger of the item 5 specified that “You pass a radar speed trap”, 83.0% of sample perceived that none at all of anger of the item 14 specified that “ You are driving behind algae truck and you cannot see around it”, and 82.5% of sample perceived that non at all of anger of the item 12 specified that “ A police officer pulls you over” respectively. On the other hand, the item analysis of driving anger found that 3.5% of sample perceived that very much anger of the item 1 specified that “some one is waving in and out of traffic”, 2.8% of sample perceived very much of anger of the item 10 specified that “ some one honks at you about your driving” respectively. (Table appendix D).

Table 4: Number and percentage of sample classified by driving anger among truck drivers

Variables	Number	Percentage
Driving anger		
Low	146	36.5
Moderated	237	59.3
High	17	4.3
Mean \pm Standard Deviation	41.83 \pm 3.53	
Lowest – High	27 – 49 scale	

Work ability.

The results showed an examination of work ability showed 58.8% of the sample had a good level, 34.3% of the sample had an excellent level, 7.0% had a moderated level and 0.3% had a poor level(Table 5). The work ability index such as health status index, found that 5.9% of sample were digestive diseases, 2.9% were hypertension diseases, 1.7% were respiratory diseases, respectively. The work ability in relation to the demand of the job index replies showed that 47.3% of sample perceived moderate their physical demand and 52% of sample perceived rather good mental demand, respectively. The sick leave during the past year index replies showed that 81.5% of sample perceived none at all, and the own prognosis of work ability index replies showed that 80.0% of sample perceived unlikely their own prognosis of work ability two years from now, and the mental resources index replies showed that 52.5% of sample perceived often their the recently been able to enjoys your regular daily activities. (Table appendix D).

Table 5: Number and percentage of sample classified by work ability among truck drivers

Variables	Number	Percentage
Work ability		
Poor	1	0.3
Moderate	28	7.0
Good	235	58.8
Excellent	136	34.0
Mean \pm Standard Deviation	25.84 \pm 6.68	
Lowest – High	14 – 45 scale	

Accidents at work.

The result shows that within the sample, 25.5% had accidents at work and 74.5% had no accidents at work. 98.0% of the drivers had one accidents and 0.2% of the drivers had more than two accidents. 66.8% of the accidents were crashes, 24.7% scraping and 5.8% were sliding. Regarding the cause of accidents 78.5% were human error, 18.6% were because of the vehicle and 2.9% were because of the environment (Table 6).

Table 6: Number and percentage of sample classified by accidents at work

Personal Information	Number	Percentage
Accident at work		
No accident	298	74.5
Accident	102	25.5
Frequency (n=102)		
1	100	98.0
> 1	2	0.2
Type of accident (n=102)		
Crash	68	66.8
Scraping	25	24.7
Sliding	6	5.8
Wheel bomb	1	0.9
Fire	1	0.9
Overturn	1	0.9
Cause (n=102)		
Person	80	78.5
Vehicle	19	18.6
Environment	3	2.9
Injury (n=10)		
Minor injury	6	60.0
Server 3 days	0	0.0
Server 1 mount	1	40.0

Part 2 The results between driving anger, work ability, distance driven, hours driven, numbers of trips, resting hours driven, workplace driven and accidents at work among truck drivers

Driving anger.

The results in the sample found that those who had accidents at work had moderate and high anger (66.6% and 4.9%). Those who had no accidents at work had moderate and high anger (56.7% and 4.0%). However, correlated testing found that driving anger was not significantly association with accidents at work among truck drivers ($\chi^2 = 3.85$ $p = .146$). (Table 7).

Table 7: The relationship between driving anger and accidents at work among truck drivers

Driving anger	Truck driving accidents (n=102) percentage		Truck driving non accidents (n=298) percentage		OR	95%CI
High	5	(4.9)	12	(4.0)	1.623	.990 – 2.662
Moderate	68	(66.6)	169	(56.7)	1.681	.549 – 5.151
Low	29	(28.4)	117	(39.2)		
	$\chi^2 = 3.85$		p-value = .146			

Work ability.

The result shows that within the sample, 26.4% who had an accidents at work had excellent work ability and 36.5% who did not have an accidents at work had excellent work ability. 65.5% who had accidents at work had moderate work ability and 7.8% good work ability. 56.3% who had not accidents at work had moderate work ability and 7.0% had good work ability. However, correlated testing found that driving anger was not associated with accidents at work among truck drivers ($\chi^2 = 3.47$ $p = .176$). (Table 8).

Table 8: The relationship between work ability and accidents at work among truck drivers

Work ability	Truck driving accidents		Truck driving non accidents		OR	95%CI
	(n=102)	percentage	(n=298)	percentage		
Moderated	8	(7.8)	21	(7.0)	1.610	.969 – 2.675
Good	67	(65.6)	168	(56.3)	1.538	.615 – 3.847
Excellent	27	(26.4)	109	(36.5)		
$\chi^2 =$	3.47		p-value = .176			

The result showed the trend of relationship between work ability index and accident by Chi-square test. In confirming the research finding, the researcher used the Paired Sample t-test to identify the difference between work ability and accidents at work. It revealed statistically significant difference between mean score of work ability of accidents at work group and non accidents at work group ($p = 0.026$). In consideration of the accidents at work group and non accidents at work group, it found that the accidents at work group had mean score of work ability was 41.16 with the standard deviation 3.38 which was less than the non accidents group was 42.06 with standard deviation 3.55.(Table 9).

Table 9: Comparison of the differences of mean score of work ability between accidents at work group and non accidents at work group among truck drivers

Variables	\bar{x}	S.D.	t-test	p-value
Work ability				
Accidents at work.	41.16	3.38	-2.240	.026*
No accidents at work.	42.06	3.55		

*P-value = .05

Job characteristics

An examination of distance driven found that in the sample, 5.9% who had accidents at work drove a distance of more than 720 kilometers/day and 7.3% who drove more than 720 kilometers/day had no accident. 89.2% of drivers who had an accident at work drove a distance less or equal to 480 kilometers/day and 83.8% who drove a distance less or equal to 480 kilometers/day had no accident. However, correlation testing found no association with the distance driven with accident at work among truck drivers significant at 0.05 ($\chi^2 = 1.93$ p = .381).

An examination of hours driven found that of the sample who had accidents at work, 12.7% were driving more than 12 hours/day, 9.8% were driving hours 8-12 hours/day and 77.4% were driving 8 or less than 8 hours/day. 74.4% who did not have an accident at work were driving less or equal to 8 hours/day. However, correlation testing found that the hours of driving was not associated with accidents at work among truck drivers significant at .05 ($\chi^2 = .367$ p = .832).

An examination of the number of trips found that of the sample, 36.2% of drivers who had more than 5 trips/day had an accident and 39.2% who had no accident at work were making 5 trips a day. 63.7% of drivers who had less or equal to 5 trips/day had an accident and 60.7% who had no accident at work were making 5 or less trips a day. However, correlation testing found that the number of trips was not associated with accidents at work among truck drivers significant to 0.05 ($\chi^2 = .286$ p = .593).

An examination of the resting hours driven found that of the sample 60.7% of drivers who had less than half hours/day rest from driving had an accident and 59.7% who had no accident at work had less than half hours/day rest. 4.9% of drivers who had more than 4 hours/day rest from driving had an accident and 1.6% who had no accident at work had more than 4 hours/day rest. However, correlation testing found that the hours of rest from driving was not associated with accidents at work among truck drivers significant at .05 ($\chi^2 = .354$ p = .170).

An examination of the workplace driven found that of the sample, 34.3% of drivers driving in Bangkok metropolitan area and 30.8% drivers driving in the central area had an accident. 29.4% of drivers driving in Bangkok metropolitan area and 30.8% drivers driving in the central area had no accident. However, correlation testing

found that the workplace area was not associated with accidents at work among truck drivers significant at .05 ($\chi^2 = .286$ p = .593). (Table 10)

Table 10: The relationship between distance driving, hours driven, number of trips, resting hour driven, and workplace driven and accidents at work among truck drivers.

Job characteristics	Truck driving accidents		Truck driving non accidents		OR	95%CI
	(n=102)percentage	(n=298)percentage	(n=102)percentage	(n=298)percentage		
Distance driven /day						
>720	6	(5.9)	22	(7.3)	.749	.294 – 1.907
480 – 720	5	(4.9)	26	(8.7)	.538	.197 – 1.417
≤ 480	91	(89.2)	250	(83.8)	1.00	
	$\chi^2 = 1.93$		p-value = .381			
Hours driven /day						
>12	13	(12.7)	42	(14.0)	.827	.390 – 1.750
8 - 12	10	(9.8)	34	(11.4)	.870	.444 – 1.705
≤ 8	79	(77.4)	222	(74.4)	1.00	
	$\chi^2 = .367$		p-value = .832			
Number of trips /day						
> 5	37	(36.2)	117	(39.2)	.881	.553 – 1.403
≤ 5	65	(63.7)	181	(60.7)	1.00	
	$\chi^2 = .286$		p-value = .593			

Table 10: The relationship between distance driving, hours driven, number of trips, resting hour driving, and workplace driven and accidents at work among truck drivers.

Job characteristics	Truck driving accidents		Truck driving non accidents		OR	95%CI
	(n=102)percentage		(n=298)percentage			
Resting hours driven						
/day						
≤ 0.5	62	(60.7)	178	(59.7)	.348	.083 – 1.112
0.5 - 4	35	(34.3)	115	(38.5)	.304	.098 – 1.244
> 4	5	(4.9)	5	(1.67)	1.00	
	$\chi^2 = 3.54$		p-value = .170			
Workplace driven						
Central and Metropolitan	35	(34.3)	92	(30.8)	2.28	.264-19.69
Central	30	(29.4)	67	(22.4)	2.68	.309-23.228
North	3	(2.9)	27	(9.0)	0.6	.053 – 6.815
South	9	(8.8)	33	(11.0)	1.63	.173– 15.33
Northeast	9	(8.8)	36	(12.0)	1.53	.160 – 14.29
East	15	(14.7)	37	(12.4)	2.43	.269 – 21.93

Part 3 The prediction by Multiple logistic regression between driving anger, work ability, distance driven, hours driven, number of trips, resting hours driven, workplace driven and accidents at work among truck drivers.

We use indicator variables to identify the classes of a qualitative variable. If the qualitative variable (workplace driven) has k classes, we require k – 1 indicator variables.

Workplace driven (X7) contains 7 classes as follows:

1. Bangkok and metropolitan
2. Central
3. North

4. South
5. Northeast
6. East
7. West

Let us define indicator variable in the following:

$$X_{71} = \begin{cases} \text{Bangkok} \\ \text{Otherwise} \end{cases}$$

$$X_{72} = \begin{cases} \text{Central} \\ \text{Otherwise} \end{cases}$$

$$X_{73} = \begin{cases} \text{North} \\ \text{Otherwise} \end{cases}$$

$$X_{74} = \begin{cases} \text{South} \\ \text{Otherwise} \end{cases}$$

$$X_{75} = \begin{cases} \text{Northeast} \\ \text{Otherwise} \end{cases}$$

$$X_{76} = \begin{cases} \text{East} \\ \text{Otherwise} \end{cases}$$

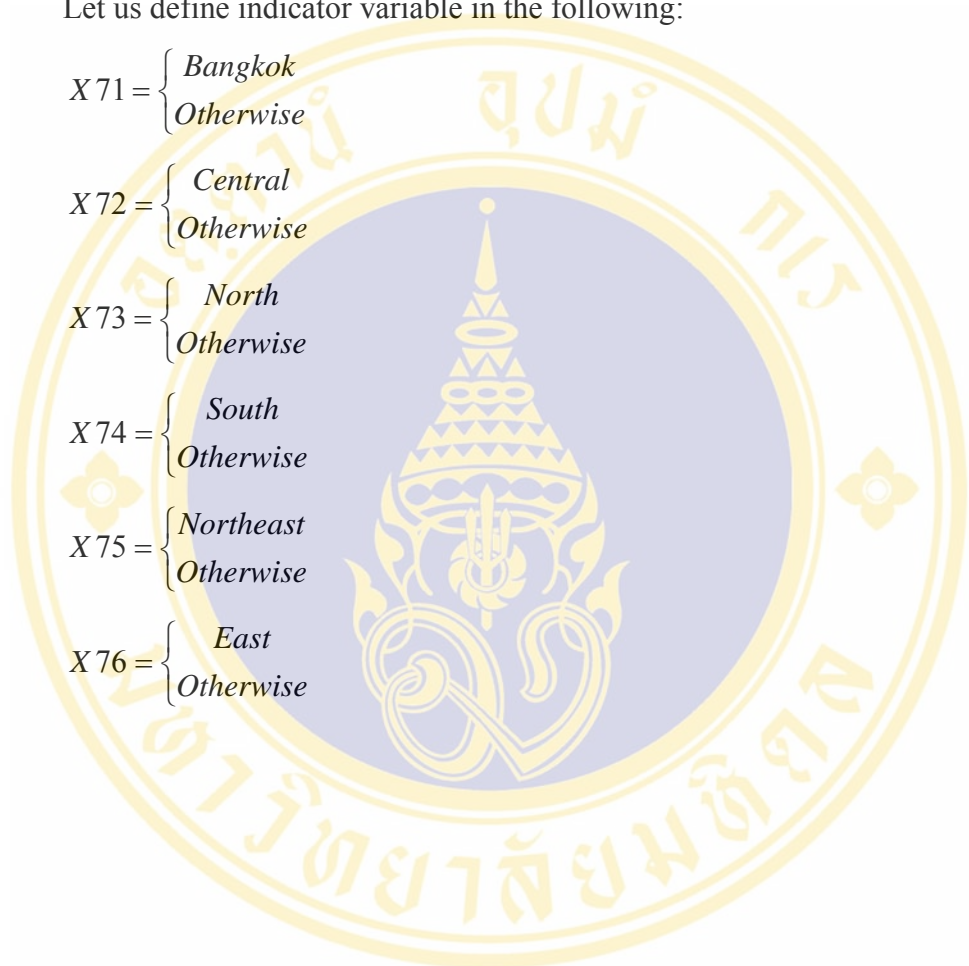


Table 11: Dummy coding for the category variables

Category variable	Dummy coding						scale
Dependent variable (Y)	1 = accident						Nominal
	0 = non accident						Nominal
Driving anger (X1)	-						Interval
Work ability (X2)	-						Interval
Distance driven / day (X3)	-						Ratio
Hours driven / day (X4)	-						Ratio
Number of trips / day (X5)	-						Ratio
Resting hours driven /day (X6)	-						Ratio
Workplace driven (X7)	X71	X72	X73	X74	X75	X76	
1. Bangkok and Metropolitan	1	0	0	0	0	0	
2. Central	0	1	0	0	0	0	
3. North	0	0	1	0	0	0	
4. South	0	0	0	1	0	0	
5. Northeast	0	0	0	0	1	0	
6. East	0	0	0	0	0	1	
7. West*	0	0	0	0	0	0	

*Reference category

In order to express the relationship between driving anger, work ability, distance driven, hours driven, numbers of trips, resting hours driven, workplace driven and accident at work among truck drivers, the logistic regression was used in this study. The criteria to include independent variables in the model concern of the following steps;

1. The selected variables with the significance in a univariate analysis were chosen into the model to test association with the binary dependent variable.
2. All of the selected variables, based on previous criteria, were entered into the model, using enters method.
3. Unconditional logistic regression analysis was done to calculate the odds ratios adjusted for the effects of other factors. The results showed that after controlling

for the effect of other confounding variables, there was not statistical significant association with accidents at work among truck drivers ($p = .05$). (Table 12)

However, in the univariate analysis work ability had shown the statistically significant association with the outcome. So, the researcher decided to consider a simple logistic model containing each of explanatory variables (Table 13).

The results from table 13 illustrated that only the work ability as an independent variable could explain significantly the association with the accidents at work. The polynomial logistic model with degree 2 of work ability was considered to test the association with the outcome. However, the association of the linearly logistic model was better than those of the quadratic model. Finally, we obtained the best model in the following:

$$\log\left(\frac{\hat{p}}{1-\hat{p}}\right) = 1.849 - 0.70 \text{ work ability}$$

The Simple logistic regression analysis illustrated only one factor of work ability associated with the accidents at work. The Odds ratio for the effect of work ability was .923 (less than 1). It could be interpreted that the truck drivers, who had the work ability increasing 1 score, the risk of the accidents at work, between one larger work ability score and the smaller work ability score, decreased by 0.923 time. In the other words, we obtained as the higher work ability, the lower accidents at work.

Table 12: The relationship between driving anger, work ability, distance driven, Hours driven, number of trips, resting hours driven, workplace driven to predict accident at work of 400 Truck drivers

Variables(n= 400)	$\hat{\beta}$	S.E.	Wald	df	P- value	OR	95%CI
1.Driving anger	.016	.018	.842	1	.359	1.01	.981 – 1.053
2.Work ability	-.060	.033	3.362	1	.071	.942	.883 – 1.005
3.Distance driven	.000	.001	.000	1	.984	1.00	.999 – 1.001
4. Hours driven	-.035	.032	1.211	1	.271	.966	.907 – 1.028
5. Number of trips	.003	.201	.000	1	.990	1.003	.676 – 1.488
6.Resting hours driven	.096	.094	1.054	1	.304	1.014	.916 – 1.323
7.Workplace area			6.605	6	.417		
Bangkok & metropolitan	1.652	1.35	1.478	1	.224	5.218	.364 – 74.86
Central	1.664	1.34	1.488	1	.222	5.177	.369 – 72.66
North	.309	1.49	.043	1	.836	1.362	.073 – 25.45
South	1.190	1.41	.708	1	.400	3.289	.206 – 52.59
Northeast	.996	1.38	.518	1	.472	2.707	.180 – 40.86
East	1.669	1.37	1.483	1	.223	5.308	.362 – 77.90

* Significant at p = 0.05

Table 13: The Simple logistics models to indicate the relationship between the accidents at work and each of independent variables.

Model	Variable	$\hat{\beta}$	S.E	Wald	df	p-value	OR	95%CI for OR
1	Driving anger	-.025	.017	2.10	1	.147	1.025	.991-1.06
	Constant	-1.715	.463	13.74	1	.000	.180	
2	Work ability	-.070	.032	4.88	1	.027*	.932	.876-.992
	Constant	1.849	1.32	1.96	1	.161	6.35	
3	Distance driven	.000	.000	.724	1	.395	1.00	.999-1.000
	Constant	-.793	.161	36.58	1	.000	.378	

Table 13: The Simple logistics models to indicate the relationship between the accidents at work and each of independent variables (Cont).

Model	Variable	$\hat{\beta}$	S.E	Wald	df	p-value	OR	95%CI for OR
4	Hours driven	-.015	.018	.693	1	.405	.985	.951-1.020
	Constant	-.980	.157	38.70	1	.000	.375	
5	Number of trips	.107	.156	.470	1	.493	1.11	.820-1.510
	Constant	-1.16	.179	42.42	1	.000	.312	
6	Resting hours driven	.096	.094	1.05	1	.304	1.10	.961-1.32
	Constant	-1.14	.138	69.0	1	.000	.317	
7	Workplace driven			6.936	6	.327		
	Bangkok and Metropolitan	.825	1.09	.565	1	.452	2.28	.265-19.64
	Central	.988	1.10	.804	1	.370	2.68	.310-23.30
	North	-.405	1.24	.107	1	.744	.66	.059-7.57
	South	.492	1.14	.185	1	.667	1.63	.174-15.39
	Northeast	.405	1.14	.126	1	.723	1.50	.160-14.08
	East	.889	1.12	.627	1	.428	2.43	.269-21.91
	Constant	-1.719	1.08	2.75	1	.097	.167	

CHAPTER V

DISCUSSION

This study focused on examining the relationship between driving anger, work ability, job characteristics and accidents at work among truck drivers. This discussion will present the following:

Part 1 Research methodology

Part 2 Results

Part 1 Research methodology

1.1 Research problem

Accidents at work of truck drivers have been increasing worldwide and reviewed literature presents many various causes of accidents in term of direct and indirect causes. Moreover, literature has known exactly the real cause of accidents among truck drivers. This study was focused on finding relationships between driving anger, work ability, job characteristics and accidents at work.

1.2 Research design

This study used a cross-sectional design to examine the association between driving anger, work ability, job characteristics and accidents at work among truck drivers. Reviewing the accidental model found other researches have used a case-control or cohort study design. Those were the best models for studying about accidents because the literature reviews explained the real cause of accidents. However, this study used a cross-sectional design because of limited time and difficulty of selecting the sample group. However, this study design can investigate what factors have a causal relationship with accidents at work. A cross-sectional study involves collecting data from the sample at the same time in order to search for association between factors. Benefits of the method include conservation of time and budget.

1.3 Size of sample group

The sample size of this study was calculated by using stratified sampling and proportional allocation (Montree, 1981 cited by Silpasuwan, P.1995:191-192). Before the data was collected from the sample, a pilot study among 30 truck drivers, who had similar demographics and environment, was conducted using the interview structure questionnaire designed for this research. Once the pilot study was completed, data was collected from truck drivers from King Rama II road (1,321), King Rama III road (615), and Bang pa-in road (3,303), resulting in a total of population of 5,239 truck drivers. Therefore, the sample group was 103, 48, and 249 respectively.

1.4 Sample group

The sample group was truck drivers, who were stopped between 15.00 - 21.00 PM on Monday to Friday at King Rama II, King Rama III and Bang pa-in road. The nature of the sample was not static position, the sampling frame was not able to prepare for completely random sampling in every stage especially the final stage of random sampling which the researcher used convenient technique for selecting the sample for the sampling framework. The limitation is the sample may not be a good representation of the truck driver population.

1.5 Research instrument

The instrument of this study was a interview structure questionnaire. All questions were close-ended or fixed alternatives. There consisted of 5 parts: (1) demographic data include age, gender, educational level, income, type of transport, years of experience driving, and region of birth, (2) driving anger scale, (3) work ability index, (4) job characteristics include distance driven, hours of driving, number of trips, resting hours driven and workplace driven and (5) number of accidents at work. The interview structure questionnaire was submitted to 5 experts for consultation concerning its content validity. The results of the pilot study were the reliability of driving anger was 0.77 and the reliability of work ability was 0.68. Thus, the instrument had validity and reliability.

1.6 Data collection

In this study, the data was collected by using the interviews with structure questionnaire. Data collection was done by the researcher and three research assistants. This method was appropriated in terms of completed information. However, this method had limitations. There was an information bias about sensitivity of the sample, they did not feel free to answer in the sentences or items seeking data on accidents because of illegal events, moreover getting accident information which may destroy their work history. Moreover, the structure questionnaire was used for interviewing during the evening, so there was not enough light, and it was in inconvenient places when some of the sample would prefer have had private time to sleep, eat and talk.

1.7 Data analysis

Descriptive statistics were used to determine demographic data of the sample and present them as frequency, percentage, mean, standard deviation, minimum, and maximum. Analytic statistics were used to determine the relationship between driving anger, work ability, distance driven, hours driven, number of trips, resting hours driven, and workplace driven with accidents at work among truck drivers. This included Chi-square testing, Odds ratio, Paired Sample t-test, and Multiple logistic regression analysis, which was used to find predicted outcome and adjusted odds ratio. Therefore, this study was appropriate with respect to statistics.

Part 2 Result

2.1 Demographic data

Demographically, the sample was 99.8% male and 0.3% female. The mean age was 39 years old, the minimum was 20 and the maximum was 72 years of age, 81.5% were married. The educational level 44.8% were primary school grad 4 and 28.3% were primary school grad 6 and surprisingly 0.5% were bachelor degrees. Fifty-seven percents had an income range of 5,001 - 10,000 baht per month and the minimum was 1,000 and the maximum was 40,000 baht per month. Mean years of experience of driving was 13.76 years, the minimum was 1 year and the maximum was 54 years. Type of transportation included industrial goods (92%) and agricultural goods (8.0 %).

The region of birth included Northeast (45.8%) and Central region (31.0%). Accidents at work: 25.5% of the sample had accidents at work and 74.5% had no accidents at work.

2.2 Independent variables

2.2.1 Driving anger

The results of this study found that of the sample 59.3% had moderate driving anger, 36.5% had low driving anger and 4.3% had high driving anger. This finding was similar to the result of Sharon, et al. (2000:310-312), who found that in Australia most of drivers have moderate driving anger. On the other hand, Sharon, et al. (2000:310-312) showed that the majority of drivers in the USA and UK had high driving anger. Furthermore, the studies of Sharon, et al. (2000:310-312) indicates that there may be cultural differences which influence responses to the driving anger scale and therefore effect on driving anger level.

2.2.2 Work ability

The result of this study found that of the sample, 58.8% had a good work ability level, 34.4% had an excellent work ability level, 7.0 % had a moderate work ability level and 0.3% had a poor work ability level. This showed that most of the sample had a good work ability level. This finding was similar to the result of Capannni, et al. (2005:253-257), which indicated that most of construction workers surveyed had a good work ability level (47.2%) and an excellent work ability level (23.6%). The result was also similar to Costa, et al.(2005:264-269), who found that most of health care worker surveyed had a good work ability level (49.7%) and an excellent work ability level.

2.2.3 Distance driving

The result of this study found that of the sample, 85.3% drove \leq 480 kilometers/day, drove a distance between 480 - 720 kilometers/day, 7.8.0 %, and 7.0% drove $>$ 720 kilometers/day. This showed that a large number of the sample were driving a long distance each day. This is similar to the result of Feyer and Williamson (1995:229-235) who found drivers were driving a distance of 1,479.5 kilometers per

trip. However, Pongpanud, K.(1996:Abstract) indicated that 53.1% of truck drivers were driving a distance less than 200 kilometers per day.

2.2.4 Driving hours.

The result of this study found that of the sample, 75.3% were driving ≤ 8 hours/day, 11.0 % were driving > 12 hours/day, and 13.8% were driving 8 -12 hours/day. The result showed that most of them were driving less than 8 hours per day. Pongpanud, K.(1996:Abstract) found that truck drivers were driving no more than 8 hours per day. Driving more than 10 hour has been shown to result of fatigue and accidents (Hakkanen, et al., 2001:195-196). Labor laws state that those driving prolong distances should not drive more than 10 - 14 hours/day. In the US, drivers are permitted to drive up to 10 hours per day and European Union limits maximum driving time to 10 hours per day. Wicheanchom, P. (2001:60) found that laws controlled the number of driving to no more than 8 hours per day or no more than 48 hours per week. Tongaram, R. (2005:45) indicated that bus drivers drove 51 - 60 hours per week. Aeangjareaykul, P.(1995: Abstract) found that truck drivers drove more than 10 hours per day.

2.2.5 Number of trips

The result of this study found that of the sample, 61.5% were driving > 5 trips/day and 38.5% were making ≤ 5 trips/day. This shows a larger number of drivers were driving less than 5 trips per day. Jareayrud, Y, et al.(2003:3-17) found that the number of trips was influenced by location, distance driven, season and wage.

2.2.6 Resting hours driving

The result found that of the sample, 60.0% of the drivers rested from driving \leq half hour/day, 37.5 % rested 1 - 4 hours/day and 2.5% rested > 4 hours/day. Resting from hours driving includes stopping to sleep, eating and checking the vehicle. Labor laws control resting hours from driving to at least half to one hour/day. The results showed that most of the sample rested from driving less than this. Jareayrud, Y, et al.(2003:3-17) indicated that truck drivers did not stop during driving because they suggested that it was a race against time. The Department of Land Transport.(2004),

found that prolonged driving resulted in fatigue and accidents. Therefore, drivers who drive around four hours should stop for at risk half an hour in order to relax then start driving again.

2.2.7 Workplace of driving

The result found that of the sample, 31.4% of the drivers drove around Bangkok and the Metropolitan area and 11.3 % drove within the Northeast. That Bangkok and the Metropolitan area has so many drivers is due to many large and small industrial areas present and the extensive transportation systems such as ships, trains, and airplanes.

2.3 Hypotheses

1. There is a relationship between driving anger and accidents at work among truck drivers.

The result showed that driving anger was not related to accidents at work at a 0.05 level of statistical significance. This result is dissimilar to that of several other studies. Deffenbacher, et al.(1994:83-91) found that driving anger effected emotions and cognition, which motivated risky behavior while driving, such as tailgating, speeding or light flashing. Dahlen and Martin (2005:345-348) found that risky driving and aggressive driving were related to accidents. Uderwood and et al.(1999:55-68) illustrated that most drivers who had accidents were frequently angry. Deffenbacher, and et al.(200:1321-1331) indicated that high anger and aggressive driving can manage anger less than low anger drivers. Boonyahotara, V. (1982:10-50) stated that high driving anger had a higher risk of accidents than low driving anger (OR = 1.89). The King Mongkut's University of Technology Thonburi (2005) indicated that the competition driving, aggressive driving, highly confident driving, violent driving and loss of attention increased the risk of accidents

This might be the reason why there was no relationship between driving anger and accidents at work. It can be explained that a cultural difference influencing responses to the driving anger scale and therefore affecting driving anger level data (Sharon and et al., 2000:306-312). Furthermore, as the data collection was retrospective over one year, the sample may have information bias on reported

information while not driving. For a more accurate picture, other instruments such as medical instruments should be used to monitor drivers while they are driving

2. There is a relationship between work ability and accidents at work among truck drivers

The result showed that work ability was related with accidents at work at a 0.05 level of statistical significance. This result is similar to that of several other studies. Ilmarinen and et al.(2005) found that workers with good or excellent work ability had less errors at work than those with poor work ability. Capanni and et al.(2005:254-257) and Ilmarinen, et al.(2001:70-95) indicated that demanding work and working conditions has an effect on work ability level. Jareayrud, Y, and et al.(2003:3-17); Saconsukon, A.(1998:35-45); Meanlamai, S.(1998:35-45) and Hataitum, R.(1996:30-60) found that the other factors including environmental at work, satisfaction with job, recent model vehicle and schedule management related to work ability level. Lindsay & Griffin (2005) indicated that the higher skill of driving related to road accidents. And Jareayrud, Y. and et al.(2003:15-17) and Ilmarinen (2005) found that the social support from family members and employer, such as providing residences for workers effect to work ability and quality of life their work. Moreover, Giovanni (2005:67-68) stated that physical, mental and social well-being were related to decreasing vigilance and performance (errors and accidents).

This result revealed that the work ability was related to years of age ($\chi^2 = 10.26$ $p=.026$) (Table appendix E) The result is similar to Ilmarinen and et al. (2005) and Giovanni (2005:62-67) which indicated that work ability related to years of age. The workers, age over 50 years old, have decrease physical ability. Considering, items analysis of work ability index, it found that 11.7% of non accidents at work and 9.8% of accidents at work group had perceived their physical demand index as very good level, 14.7% of non accidents at work group and 7.8% of accidents at work group had perceived their mental demand index as very good level.

Moreover, There were 17.6% of accidents at work group perceived that sick leave during work index whiled the non accidents at work group were 13.4%. The result revealed that 4.9% of accidents at work group relative certain perceived in their own prognosis of work ability index whiled non accidents at work group were 0.3%. The result showed that 54.4% of non accidents at work group and 48.0% accidents at

work group were often perceived in the item 6 “the recently been able to enjoy your regular daily job”. (Table appendix D).

3. There is a relationship between distance driven and accidents at work among truck drivers

The result showed that distance driven was not related with accidents at work at a 0.05 level of statistical significance. This result is dissimilar to that of several other studies. Feyer and Williamson (1995:230-235) and Siriwudtanamatanon, R. (1987:10) showed that driving long distances was related to the number of crashes. Hataitum, R. (1996:40) found driving more than, or equal to 200 kilometers per day had an accident prevalence rate of 2.02 more than driving a distance less than 200 kilometers per day. Kasadwisai, H. (1996: Abstract) revealed that driving irregular shifts during the day and night resulted in fatigue related to crashes.

This might be the reason why there was no relationship between distance driven and accidents at work. It could be explained that the sample may be due to recall bias, such as drivers forgetting the true distance they drove per day over the last year. Other factors that may have prevented finding a relationship include drivers checking their trucks before and during driving, which has been shown to reduce accidents (Kudchaman, S.1998:50-70; and The King Mongkut’s University of Technology Thonburi (2005) and activities such as using two drivers where the person not driving drinks coffee, adjusting the ventilation, eating sweets and relaxing by listening to the radio or music (Jareayrud, Y, and et al., 2003: 10-17; Siriwudtanamatanon, R., 1988:50-64).

4. There is a relationship between hours driven and accidents at work among truck drivers

The result showed that hours driven was not related with accidents at work at a 0.05 level of statistical significance. This result is dissimilar to that of several other studies. The King Mongkut’s University of Technology Thonburi.(2005) showed that hours driven was related with fatigue associated with increased risk for crashes. Many studies indicated that drivers driven for more than 12 hours per day were involved in road crashes(Melin, 1981; Mcdonald 1984; Kaneko and Jovanis 1992, Summula and Mikkola 1994 cited in Sabblagh, (2005:110), Julie and Andrew (2003:763-764)

Hakkanen, and Heikki.(2001:190-196) Sareeruk, A. (2001:190-191) found that drivers who had been driving an average of 10 - 14 hours per day preceded accidents. Hataitum, R. (1996:40-65) found that drivers driving more than 8 hours per day were 2.45 times more at risk of accidents than drivers driving less than 8 hours.

This might be the reason why there was no relationship between hours driven and accidents at work. It is possible that the sample may be due to the drivers forgetting the number of hours driven per day and the questionnaire did not ask the number of continuous driving hours. Furthermore, the sample had temporary strategies such as using two drivers where the person not driving drinks coffee, adjusts the ventilation, eats sweets and relaxes by listening to the radio or music (Jareayrud, Y, and et al.2003:3-17). As above, there factors may reduce the number of truck driver accidents.

5. There is a relationship between number of trips and accidents at work among truck drivers

The result showed that number of trips was not related with accidents at work at a 0.05 level of statistical significance. This result is dissimilar to that of several other studies. Kunjarey, M.(2005:80-84); Jareayrud, Y. and et al.(2003: 10-12); Sareeruk, A, (2001:190-194) and Kasadwisad, H. (1996:Abstract) illustrated that truck drivers are paid per trip and those who were highly motivated made more trips and so they became more fatigued and had more accidents. Feyer and Williamson (2001:230-235) indicated that shorter trips and greater flexibility in arranging the timing and scheduling of trips were related to lowering accidents.

This might be the reason why there was no relationship between number of trips and accidents at work It is possible due to that most of sample was driving in Bangkok, the Metropolitan and Central areas, and employers managed number of trips drivers made. Such factors have been shown to reduce accidents at work (Jareayrud, Y. and et al., 2003:10-15). In addition, truck drivers who drive short distances may make many trips, while on the other hand, truck drivers who drive long distances make fewer trips (Jareayrud, Y, and et al., 2003:3-17). Furthermore, it is possible that the season of production was related to the number of trips drivers make.

6. There is a relationship between resting hours driven and accidents at work among truck drivers

The result showed that resting hours driven was not related with accidents at work at a 0.05 level of statistical significance. This result is not similar to that of several other studies. Jareayrud, Y. and et al. (2003:3-17); Kasadwisad, H.(1996: Abstract); Pongpanud, K.(1997: Abstract) and Srirecha, P. (1999: Abstract) illustrated that most truck drivers worked both day and night six days a week, resulting in fatigue and accidents. Sareeruk, A.(2001:195) and Wicheanchom, P.(2001:62-64) indicated that workers should rest at least one hour per day to avoid fatigue and accidents. Drivers must stop at least twenty minutes per time. Mclean (2005:1-10), The King Mongkut's University of Technology Thonburi (2005) and Griffin (2005:10) explained that the numbers of hours driven, resting hours from driving and hours slept are all associated with accidents. Interviewed truck drivers explained that "I drive short distances so I do not stop because I do not want to lose time. I stop only when we finish work" and "When I drive long distances I do not stop because of limited time. If we stop, the loss of property such as fish, vegetables and other agriculture goods may result" (Jareayrud, Y, and et al., 2003:3-16).

This might be the reason why there was no relationship between number of trips and accidents at work. It could be explained that the drivers forgetting the number of resting hours per day and the questionnaire did not ask the number of continuous resting hours. Furthermore, the questionnaire did not separate whether it was a short trip or long trip driven, therefore there is mixed information, and the interviewed technique had sensitive to feelings related to breaking the law or damaging the driver's reputation.

7. There is a relationship between workplace driven and accidents at work among truck drivers.

The result showed that workplace driven was not related with accidents at work at a 0.05 level of statistical significance. The result of this study is dissimilar to that of several other studies. Suntonruk, P.(1990 cited in Kudchaman, S. 1998:80); Singsri, D.(1999:20-50) indicated that less traffic on the road was related to more accidents than heavy traffic because drivers have to be more careful while driving. The

King Mongkut's University of Technology Thonburi (2005) stated that each location and road condition of driving effect to difference of accidents.

This might be the reason why there was no relationship between workplace driven and accidents at work. It could be explained that in this study, a large proportion of the drivers drove around Bangkok, Metropolitan area and the large Central area and geography is flat which is easier to drive in contrast to the hilly north region. These are industrial locations, supported by many transport systems including motorways and toll-ways. Furthermore, they may be influencing the result could be driver skill, driving experience and decision making processes while driving and they have more experience and skill had less accidents than those who had less experience and skill (Kudchaman, S.,(1998:80-82) and Singsri, D., (1999:10-30).

CHAPTER VI

CONCLUSION

Accidents at work among truck drivers were increasing and stable in Thailand. The research presented here was conducted to explain the relationship between driving anger, work ability, job characteristics and accidents at work among truck drivers using a cross-sectional survey design. The sample was 400 truck drivers, who were stopped in the Bangkok area between 15.00 - 21.00 PM Monday - Friday on King Rama II road, King Rama III road and Bang pa-in road.

The interview structure questionnaire had been used to answer the research problems, consisting of 5 parts: (1) demographics data include age, gender, educational level, income, type of transport, years of experience driving, and region of birth, (2) driving anger scale, (3) work ability index, (4) job characteristics include distance driven, hours of driving, number of trips, resting hours from driving and workplace driven and (5) number of accidents at work. The questionnaire was examined for content by 5 experts and try out on 30 truck drivers. The results had a cronbach s alpha coefficient .77(Driving anger scale) and .68(Work ability index).

The interview with a structured questionnaire was used for the data collecting and was carried out during 1 August - 31 September 2006. The data were checked and entered and analyzed by SPSS for windows. The descriptive statistics used were frequency, mean, standard deviation, maximum, and minimum and analytical statistics used were the Chi-square test, Odds ratio, Paired Sample t-test, and Multiple logistic regressions. The results of this study are summarized as follows.

Research summary

1.1 Personal and general information : Most of the sample were male (99.8%), ranging between 31 - 40 years of age (34.3%), with the minimum age being 16 years old and the maximum age being 72 years old. Most of the drivers were married (81.5%). 44.8% of them had finished primary school 4. 28.3% had finished primary school 6. Their income ranged between 5,001 - 10,000 baht/month (57.0%). The type

transport the drivers drove was industrial (92.0%) and agricultural (8.0%). Drivers with less than 10 years driving experience were 48.5% and between 11- 20 years was 31.3%. 45.8% of the drivers were from the Northeast region and 31% were from the Central region.

1.2 Driving anger: 59.3% of the sample had moderate driving anger, 36.5% had low driving anger and 4.3% had high driving anger.

1.3 Work ability: 58.8% of the drivers had good work ability, 7.0% had moderate work ability and 0.3% had low work ability.

1.4 Distance driven: 85.3% of the drivers drove less than or equal to 480 kilometers/day, 7.8% drove between 480 - 720 kilometers/day 7.0 % drove more than 720 kilometers/day.

1.5 Hours driven: 75.3 % of the drivers were driving less than or equal to 8 hours/day, 11.0% were driving more than 12 hours/day and 13.8% were driving between 8 - 12 hours/day.

1.6 Number of trips: 38.5 % of the sample drove more than 5 trips/day, and 61.5 % made less than or equal to 5 trips/day.

1.7 Resting hours driven: 60.0% of the drivers rested less than or equal to half hour/day, 37.5% rested between 1 - 4 hours/day and 2.5% rested more than 4 hours/day

1.8 Workplace driven: 31.4% of the drivers drove in Bangkok and the Metropolitan, 24.3% drove in the Central region and 11.3% drove in the Northeast.

1.9 Accidents at work: 25.5% of the sample had accidents at work and 74.5% had no accidents at work. 98.0% of the accidents were the driver having only one accident and 0.2% of the drivers reported more than one. The type of accident included crashing (66.8%), scraping (24.7%) and sliding (5.8%). The cause of accident was reported as human error (78.5%), vehicle (18.6) and environment (2.9%).

2. The result found that work ability has significant associations with accidents at work among truck drivers (p- value <.05).

3. Other predictors were not significantly associated with accidents at work among truck drivers.

Implication of this study.

This study explored the preliminary data of the relationship between driving anger, work ability, distance driven, hour driven, number of trips, resting hours driven, and workplace driven, and accidents at work among truck drivers. The information is provided for health care personal and those who have concerns about accidents prevention of drivers in their working conditions, in order to provide the kinds of strategies to appropriately manage and assess that accidents prevent and control for truck drivers or workers. The finding also confirmed the accidents at work. Especially, the work ability had been related to accidents at work that was congruent with the result of Ilmarinen(2005) who explained that the work ability associated with work errors and accidents at work among workers in the workplace. Moreover, this finding provides the important information as follows aspects.

Recommendations**Service aspect.**

Employers should assess drivers' work ability before taking up employment drivers and during the period of driving at least one time per year. Particularly, restore work ability of drivers who are over 50 years old, and enhance the acceptable work ability level in high risk groups, poor to moderate work ability level and also provide knowledge about accidents at work.

Administration aspect.

Employees and employers should plan a work ability policy such as physical and mental health screening and manage work ability themselves.

Academic aspect.

Regarding, the measurement of work ability index in health status perception, should be replace or health screening mental or health examination by the Occupational Health Nursing for the target group.

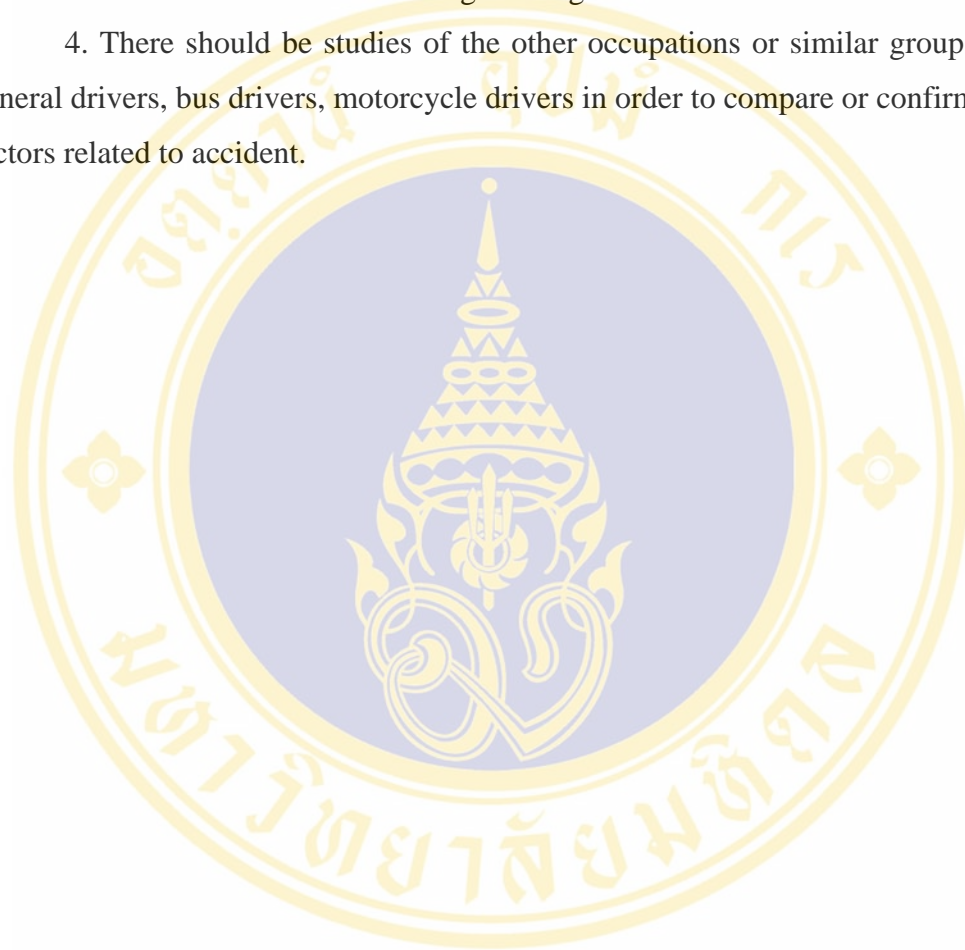
Recommendations for further research

1. A cohort study or case-control study should be designed in order to monitor the accidents at work group and the non accidents at work group.

2. A network should be established for data collection such as from police stations and from hospitals. These will support and provide information convenient for accident study.

3. There should be care in the use of retrospective data. There may possible be recall bias because of emotional feelings or forgetfulness.

4. There should be studies of the other occupations or similar groups such as general drivers, bus drivers, motorcycle drivers in order to compare or confirm the factors related to accident.



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อุบัติเหตุจากการทำงานในโรงงานผลิตภัณฑ์ยางพารา. วิทยานิพนธ์พยาบาลศาสตรมหาบัณฑิต, บัณฑิตวิทยาลัย มหาวิทยาลัยสงขลานครินทร์.

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APPENDIX A

List of experts

The names of qualified persons who examined the validity of the questionnaire are as follows:

1. Assoc. Prof. Orawan Kaewboonchoo.
Department of Public health Nursing, Faculty of Medicine.
Mahidol University.
2. Assoc. Prof. Supapan Kodjarud.
Department of Psychology, Faculty of Psychology.
Chulalongkorn University.
3. Dr. Sasitorn Thaptakanporn.
Bureau of occupational and environment disease, Department of control disease.
Ministry of Public Health.
4. Dr. Somkiat Siriruttanapruk.
Bureau of occupational and environment disease, Department of control disease.
Ministry of Public Health.
5. Mrs. Pijitra Tanodom.
Social Security Office.

APPENDIX B

Informed Consent Form

Informed Consent Form แบบฟอร์มใบยินยอมให้ทำการวิจัย
โดยได้รับการบอกกล่าวและเต็มใจ (Informed Consent Form)

การวิจัยเรื่อง

ปฏิสัมพันธ์ระหว่างความโกรธในขณะขับรถ ความสามารถในการทำงาน และลักษณะงานกับการ
เกิดอุบัติเหตุในการทำงานของพนักงานขับรถบรรทุก

วันที่ให้คำยินยอม วันที่เดือนพ.ศ.

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับคำอธิบายจากผู้วิจัยถึง
วัตถุประสงค์ของการวิจัย วิธีการวิจัย รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียดและมีความ
เข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบังซ่อนเร้นจน
ข้าพเจ้าพอใจ

ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมใน โครงการวิจัยนี้เมื่อใดก็ได้ และเข้าร่วม
โครงการวิจัยนี้โดยสมัครใจและการบอกเลิกการเข้าร่วมการวิจัยครั้งนี้ จะไม่มีผลต่อตัวข้าพเจ้า

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะเกี่ยวกับตัวข้าพเจ้า ครอบครัว และบุตรของข้าพเจ้าต่อ
หน่วยงานต่างๆ ที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ผู้วิจัยรับรองว่าหากมีข้อมูลเพิ่มเติมที่ส่งผลกระทบต่อการศึกษา ข้าพเจ้าจะได้รับการแจ้งให้
ทราบโดยไม่ปิดบัง ซ่อนเร้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการและได้ลงนามในใบ
ยินยอมนี้ด้วยความเต็มใจ

ลงนามผู้ยินยอม

ลงนามพยาน

ลงนามพยาน

APPENDIX C

Research instruments

เรื่อง

ปฏิสัมพันธ์สัมพันธ์ระหว่างความโกรธในขณะขับรถ ความสามารถในการทำงาน และลักษณะงาน
กับการเกิดอุบัติเหตุในการทำงานของพนักงานขับรถบรรทุก

คำชี้แจง แบบสอบถามชุดนี้มีวัตถุประสงค์เพื่อต้องการศึกษาปฏิสัมพันธ์ระหว่างความโกรธ
ในขณะขับรถ ความสามารถในการทำงาน และลักษณะงาน กับการเกิดอุบัติเหตุในการทำงานของ
พนักงานขับรถบรรทุก เพื่อเป็นการค้นหาปัจจัยที่เป็นสาเหตุของการเกิดอุบัติเหตุในการทำงานซึ่ง
จะได้เป็นข้อมูลในการวางแผนแก้ไขปัญหาดังกล่าวเพื่อประโยชน์ต่อพนักงานขับรถบรรทุกและผู้ที่มี
หน้าที่เกี่ยวข้องกับอาทิ นายจ้าง ลูกจ้าง เจ้าหน้าที่ปลอดภัย พยาบาลอาชีวอนามัย ต่อ ไป

แบบสอบถามชุดนี้มีทั้งหมด 5 ส่วนคือ

ส่วนที่ 1 ข้อมูลส่วนบุคคล

ส่วนที่ 2 แบบสอบถามเกี่ยวกับลักษณะงานของการขับรถบรรทุก

ส่วนที่ 3 แบบสอบถามเกี่ยวกับความสามารถในการทำงาน

ส่วนที่ 4 แบบสอบถามเกี่ยวกับความโกรธในขณะขับรถ

ส่วนที่ 5 แบบสอบถามเกี่ยวกับการเกิดอุบัติเหตุในการทำงาน

ข้อมูลที่ได้จากการตอบแบบสอบถามนี้ ผู้วิจัยขอรับรองว่าจะถูกเก็บไว้ใช้เฉพาะในการศึกษาวิจัย
เท่านั้น ไม่มีมีการเปิดเผยรายชื่อ ไม่มีผลต่อการปฏิบัติงานของท่านและจะนำเสนอผลงานวิจัยใน
ภาพรวมเท่านั้น หากพนักงานขับรถบรรทุกท่านใดมีข้อสงสัยประการใดเกี่ยวกับงานวิจัยครั้งนี้
ผู้วิจัยยินดีตอบและให้ซักถามข้อสงสัยได้ตลอดการศึกษาวิจัย และขอขอบคุณพนักงานขับ
รถบรรทุกที่ให้ความร่วมมือในการตอบแบบสอบถามเป็นอย่างดี

นายพรเลิศ ชุ่มชัย

นักศึกษาระดับปริญญาโท ภาควิชาการพยาบาลสาธารณสุข

คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล

เลขที่แบบสอบถาม.....
วันที่ทำการเก็บข้อมูล.....
ครั้งที่.....

ส่วนที่ 1 ข้อมูลส่วนบุคคล

1. ท่านเกิดวันที่เดือนพ.ศ. ปัจจุบันอายุปี เดือน
2. เพศ () ชาย () หญิง
3. สถานภาพสมรสของท่านคือ
() โสด () สมรส () หม้าย/หย่า/แยก
4. ระดับการศึกษาของท่านคือ
() ไม่ได้เรียน () ประถมศึกษาด้าน
() ประถมศึกษาปลาย () มัธยมศึกษา
() อนุปริญญา/ปริญญาตรี () อื่นๆ (โปรดระบุ)
5. รายได้เฉลี่ยต่อเดือน (เฉพาะจากการจ้างรับรถบรรทุก) บาทต่อเดือน
6. ประเภทสินค้าที่ท่านขนส่งคือ () เกษตรกรรม () อุตสาหกรรม
() อื่นๆ (โปรดระบุ).....
7. ท่านจ้างรับรถบรรทุกมาเป็นระยะเวลาปี (รวมระยะเวลาทั้งหมดที่จ้างรับรถบรรทุกที่จ้างอย่างต่อเนื่อง ถ้าหยุดจ้างรถต้องไม่รวมเวลาด้วย)
() จ้างอย่างต่อเนื่อง
() จ้างแล้วหยุดทำงานอื่น หยุดจ้างจำนวน.....ปี เริ่มจ้างใหม่ได้จำนวน.....ปี
หลังหยุดจ้างท่านทำงานอะไร
8. ท่านมีภูมิลำเนาอยู่จังหวัดใด

ส่วนที่ 2 ลักษณะงานการรับรถบรรทุกที่มีหน่วยต่อเดือน

การรับรถบรรทุก	จุดเริ่มต้น ถึง จุดปลายทาง (รวมเข้าไป-จากลิ้น)	ระยะทางการขับรถ (กิโลเมตร) (รวมเข้าไป-จากลิ้น)	จำนวนชั่วโมงการขับรถ (ชั่วโมง) (รวมเข้าไป-จากลิ้น)	จำนวนชั่วโมงการพักผ่อน ระหว่างขับรถ (ชั่วโมง) (รวมเข้าไป-จากลิ้น)
การเดินทางสายที่ 1	ระหว่างกรุงเทพมหานคร ถึง.....	.....	.....	.....
การเดินทางสายที่ 2	ระหว่างกรุงเทพมหานคร ถึง.....	.....	.....	.....
การเดินทางสายที่ 3	ระหว่างกรุงเทพมหานคร ถึง.....	.....	.....	.....
การเดินทางสายที่ 4	ระหว่างกรุงเทพมหานคร ถึง.....	.....	.....	.....
การเดินทางสายที่ 5	ระหว่างกรุงเทพมหานคร ถึง.....	.....	.....	.....
รวม	ภูมิภาค .....	.....กิโลเมตร	.....ชั่วโมง	.....ชั่วโมง

ส่วนที่ 3 แบบสอบถามเกี่ยวกับความสามารถในการทำงาน

1. ท่านคิดว่าความสามารถในการทำงานของท่านปัจจุบันอยู่ในระดับใด หากเปรียบเทียบกับความสามารถในการทำงานสูงสุดที่ผ่านมาของท่าน (สมมติให้ความสามารถในการทำงานตั้งแต่ 0 ถึง ระดับสูงสุด =10) ให้ท่านวงกลมรอบตัวเลข



2. ถ้าเป็นการทำงานที่ต้องใช้กำลังกาย ท่านคิดว่าความสามารถในการทำงานของท่าน ปัจจุบันนี้อยู่ในระดับใด
 ดีมาก ค่อนข้างดี ปานกลาง ไม่ค่อยดี ไม่ดีเลย
3. ถ้าเป็นการทำงานที่ต้องใช้ความคิด ท่านคิดว่าความสามารถในการทำงานของท่าน ปัจจุบันนี้อยู่ในระดับใด
 ดีมาก ค่อนข้างดี ปานกลาง ไม่ค่อยดี ไม่ดีเลย
4. ท่านเจ็บป่วยเกี่ยวกับโรคต่อไปนี้บ้างหรือไม่ ให้ใส่เครื่องหมายตามช่องที่กำหนด

โรค	ป่วย (ตามที่แพทย์วินิจฉัย)	ป่วย (ตามการรู้สึกของตนเอง)	ไม่ป่วย
บาดเจ็บจากอุบัติเหตุ			
1. หลัง			
2. แขน/มือ			
3. ขา/เท้า			
4. อวัยวะอื่น ๆ ระบุ.....			
โรคที่เกี่ยวกับกระดูกและกล้ามเนื้อ			
5. ปวดเมื่อยซ้ำ ๆ หรือมีความผิดปกติบริเวณหลังส่วนบนหรือคอ			

โรค	ป่วย (ตามที่แพทย์ วินิจฉัย)	ป่วย (ตามการรู้สึก ของตนเอง)	ไม่ป่วย
6. ปวดเมื่อยขี้ ้ ๆหรือมีความผิดปกติบริเวณหลังส่วนล่าง			
7. ปวดแสบจากหลังลงมาที่ขา			
8.ปวดเมื่อยขี้ ้ ๆหรือมีความผิดปกติที่มือ / เท้า			
9. โรครูมาตอยด์			
10. โรคอื่น ๆ ระบุ.....			
โรคหัวใจและหลอดเลือด			
11. ความดันโลหิตสูง			
12.โรคหลอดเลือดหัวใจ/เจ็บหน้าอกเวลาออกกำลังกาย			
13. กล้ามเนื้อหัวใจตาย			
14. โรคหัวใจขาดเลือด			
15. โรคหัวใจอื่น ๆ ระบุ.....			
โรกระบบทางเดินหายใจ			
16. การติดเชื้อระบบทางเดินหายใจขี้ ้ ๆ รวมถึงต่อม ทอลซิล/ไซนัส / หลอดลมอักเสบเฉียบพลัน			
17.หลอดลมอักเสบเรื้อรัง			
18.ไซนัสอักเสบเรื้อรัง			
19.หอบหืด			
20. ถุงลมปอดโป่งพอง			
21. วัณโรคปอด			
22. โรกระบบทางเดินหายใจอื่น ๆ ระบุ.....			
ความผิดปกติเกี่ยวกับจิตใจ			
23. โรคจิตหรือปัญหาสุขภาพจิตรุนแรง เช่น ภาวะ ซึมเศร้ารุนแรงอารมณ์แปรปรวน			
24. ความผิดปกติหรือปัญหาสุขภาพจิตเล็กน้อย เช่น ซึมเศร้าเล็กน้อย / ตึงเครียด / วิตกกังวล / นอนไม่หลับ			

โรค	ป่วย (ตามที่แพทย์ วินิจฉัย)	ป่วย (ตามการรับรู้ ของตนเอง)	ไม่ป่วย
โรคระบบประสาทและประสาทรับรู้สัมผัส			
25. โรคหรือการบาดเจ็บเกี่ยวกับการได้ยิน (เช่นการได้ยินเสื่อม / ได้รับความเจ็บที่หู)			
26. โรคหรือการบาดเจ็บเกี่ยวกับการมองเห็น (เช่น สายตาเสื่อม / ได้รับความเจ็บที่ตา)			
27. สมอฆาดเลือด / ลมชัก / ปลายประสาทอักเสบ / ปวดศีรษะข้างเดียว			
28. โรคอื่น ๆ ระบุ.....			
โรคเกี่ยวกับระบบย่อยอาหาร			
29. นิ้วในอุ้งน้ำดี			
30. โรคตับ / ตับอ่อน			
31. แผลในกระเพาะอาหารหรือลำไส้เล็ก			
32. กระเพาะอาหารหรือลำไส้อักเสบ			
33. ลำไส้ใหญ่อักเสบ			
34. โรคอื่น ๆ ระบุ.....			
โรคเกี่ยวกับระบบทางเดินปัสสาวะและอวัยวะเพศ			
35. ทางเดินปัสสาวะอักเสบ			
36. โรคไต			
37. โรคระบบสืบพันธุ์ เช่น ท่อรังไข่อักเสบ อังเชิงกราน (หญิง) การติดเชื้อที่ต่อมลูกหมากอักเสบ (ชาย)			
38. โรคอื่น ๆ ระบุ.....			
โรคผิวหนัง			
39. ผื่นแพ้คัน หรืออักเสบ			
40. ผื่นอื่น ๆ ระบุ.....			
41. โรคผิวหนังอื่น ๆ ระบุ			

โรค	ป่วย (ตามที่แพทย์ วินิจฉัย)	ป่วย (ตามการรู้สึก ของตนเอง)	ไม่ป่วย
เนื้องอก			
42. เนื้องอกธรรมดา			
43. เนื้องอกอันตราย(มะเร็ง) ระบุตำแหน่ง.....			
โรคระบบต่อมไร้ท่อ และการเผาผลาญ			
44. โรคอ้วน			
45. เบาหวาน			
47. โรคอื่น ๆ ระบุ.....			
โรคเลือด			
48. โลหิตจาง			
49. โรคเลือดอื่น ๆ ระบุ.....			
ความพิการแต่กำเนิด			
50. ความพิการแต่กำเนิด			
ระบุ			
โรคอื่นๆ			
51. ระบุ			

5. การเจ็บป่วยหรือการบาดเจ็บต่าง ๆ มีผลกระทบต่อการทำงานของท่านในปัจจุบันหรือไม่อย่างไร (ตอบได้มากกว่า 1 ตัวเลือก)

- () ทำงานได้ตามปกติเนื่องจากไม่มีอาการผิดปกติหรือการเจ็บป่วยในปัจจุบัน
- () สามารถทำงานได้ตามปกติ แต่มีอาการผิดปกติของร่างกาย หรือเจ็บป่วยเป็นบางครั้ง
- () ต้องลดงานลง หรือเปลี่ยนวิธีการทำงานเป็นบางครั้ง เนื่องจากเจ็บป่วย
- () ต้องลดงานลง หรือเปลี่ยนวิธีการทำงานบ่อย ๆ เนื่องจากเจ็บป่วย
- () ทำได้เฉพาะงานชั่วคราว ไม่สามารถทำงานประจำได้ เนื่องจากปัญหาสุขภาพและการเจ็บป่วย
- () ทำงานไม่ได้อีกต่อไป เนื่องจากปัญหาสุขภาพและการเจ็บป่วย

6. ในรอบ 1 ปีที่ผ่านมาท่านต้องหยุดงานทั้งวันเนื่องจากปัญหาสุขภาพหรือการเจ็บป่วยหรือการหยุดเพื่อไปรับการรักษารวมทั้งสิ้นกี่วัน

- () ไม่เคยหยุดเลย

- () 1-9 วัน
() 10-24 วัน
() 25-99 วัน
() 100-365 วัน
7. ให้ท่านประเมินความสามารถในการทำงานของท่านจากภาวะสุขภาพของท่านในปัจจุบัน ท่านคิดว่าท่านสามารถทำงานที่ท่านทำอยู่ในปัจจุบันนี้ได้หรือไม่ อย่างไร นับจากวันนี้ไป ถึง 2 ปี ข้างหน้า
- () ทำได้เหมือนเดิมแน่นอน
() ไม่ค่อยแน่ใจว่าจะทำได้เหมือนเดิมหรือไม่
() ทำไม่ได้เหมือนเดิมแน่นอน
8. ปัจจุบันท่านสามารถสนุกสนานกับงานและชีวิตประจำวันได้มากน้อยแค่ไหน
- () บ่อย ๆ
() ค่อนข้างบ่อย
() เป็นบางครั้ง
() นาน ๆ ครั้ง
() ไม่เคยเลย
9. ปัจจุบันท่านยังคงอยากทำงานตลอดเวลา และตื่นตัวกับงานและชีวิตมากน้อยแค่ไหน
- () เป็นประจำ สม่ำเสมอ
() ค่อนข้างบ่อย
() เป็นบางครั้ง
() นาน ๆ ครั้ง
() ไม่เคยเลย
10. ปัจจุบันท่านยังคงรู้สึก มีความหวังเต็มเปี่ยมกับอนาคตของท่าน
- () ตลอดเวลา
() ค่อนข้างบ่อย
() เป็นบางครั้ง
() นาน ๆ ครั้ง
() ไม่เคย

ส่วนที่ 4 แบบสอบถามเรื่องความโกรธในขณะขับรถ

คำอธิบาย ให้ทำเครื่องหมายถูก (/) หน้าข้อความที่ตรงกับความรู้สึกของท่านขณะขับรถโดยให้คะแนนดังต่อไปนี้

ไม่รู้สึกโกรธเลย	1
โกรธเล็กน้อย	2
โกรธบ้าง	3
โกรธมาก	4
โกรธมากที่สุด	5

สถานการณ์ในขณะขับรถ	ไม่รู้สึก โกรธเลย (1)	โกรธเล็กน้อย (2)	โกรธ บ้าง (3)	โกรธ มาก (4)	โกรธมาก ที่สุด (5)
1. ในขณะที่ท่านขับรถมีรถคันหนึ่งขับแซงตัดหน้ารถของคุณและบางครั้งขับออกจากเลน					
2. ในขณะที่ท่านขับรถมีรถคันหนึ่งอยู่หน้ารถของท่านทำให้รถของท่านขับไปได้ช้าเหมือนราวกับขับรถขึ้นภูเขา และรถดังกล่าวไม่จอดข้างทางหรือไม่ให้รถคันอื่นขับผ่านไป					
3. ในขณะที่ท่านขับรถมีรถคันข้างหน้าถอยหลังทันทีโดยไม่ได้มองว่ามีรถคุณอยู่ข้างหลัง					
4. ในขณะที่ท่านขับรถมีคนขับรถฝ่าไฟแดงไปได้ในแต่ในขณะที่เดียวกันคุณต้องหยุดตรงบริเวณไฟแดงพอดี					
5. ในขณะที่ขับรถท่านต้องลดระดับความเร็วในการขับให้อยู่ในระดับกำหนดจับความเร็ว					
6. ในขณะที่ขับรถมีรถคันข้างหน้าพยายามเร่งรถในขณะที่ท่านพยายามจะขับแซงรถคันนั้น					
7. ในขณะที่ขับรถมีคนจอดรถนานและออกตัวช้าทำให้การจราจรติดขัด					

สถานการณ์การขับรถ	ไม่รู้สึกล้อ ไถ่ ไถ่ (1)	ไถ่ ไถ่ ไถ่ (2)	ไถ่ ไถ่ (3)	ไถ่ ไถ่ (4)	ไถ่ ไถ่ ไถ่ (5)
8.ในขณะที่ขับรถคุณอยู่ในการจราจรติดขัดมาก ทำให้ ท่านไม่สามารถเคลื่อนรถได้เลยเป็นเวลานาน					
9.มีคนทำท่าล้อเลียนหรือตะโกนด่าว่าเสียงดังใส่ใน ขณะท่านขับรถ					
10.ในขณะที่ท่านขับรถมีรถคันหลังบีบแตรใส่ท่าน เพื่อให้ท่านออกรถโดยเร็ว ทั้งๆข้างหน้าว่าง					
11.ในขณะที่ท่านขับรถมีคนขับรถมอเตอร์ไซค์วิ่งเข้ามา อยู่ในกลางเลนทำให้ท่านขับรถได้ช้า					
12.ในขณะที่ท่านขับรถมีเจ้าหน้าที่ตำรวจ ณ.บริเวณ ด่านตรวจเรียกตรวจข้างทาง เพื่อทำการตรวจสอบหน้าที่					
13.ในขณะที่ท่านขับรถมีรถบรรทุกขนทรายและกรวด อยู่ข้างหน้ารถท่านทำให้มีกรวดและทรายกระเด็นใส่ รถที่ท่าน					
14.ในขณะที่ท่านขับรถอยู่หลังรถบรรทุกคันใหญ่กว่า ทำให้ไม่สามารถมองเห็นรอบด้านได้					

ส่วนที่ 5.แบบสอบถามเรื่องอุบัติเหตุในการทำงาน

5. ในรอบ 1 ปีที่ผ่านมาในขณะคุณขับรถทุกคุณเคยเกิดอุบัติเหตุหรือไม่ (เหตุการณ์ที่เกิดขึ้นในขณะคุณขับรถบรรทุก เช่น การขับรถประตอกับรถคันอื่นหรือสิ่งของ, ถูกรถคันอื่นเฉี่ยวชน, การขับรถไถลตกไหล่ทาง, ถอยรถชนสิ่งของ, การถอนหลังเข็นขนคันอื่นหรือสิ่งของเสียหาย เป็นต้น)
 ไม่เคย
 เคย (สำหรับผู้ตอบว่าเคยเกิดอุบัติเหตุตอบคำถามข้อ 5.1 – 5.4)

5.1 จำนวนครั้งของการเกิดอุบัติเหตุครั้ง ครั้งที่ 1. เกิดอุบัติเหตุเมื่อ วันที่..... เดือนพ.ศ. เวลาน ลักษณะการเกิด <input type="checkbox"/> ขับรถชนประตอกับรถคันอื่น, สิ่งของ <input type="checkbox"/> ถูกรถคันอื่นชน <input type="checkbox"/> รถไถลข้างถนน <input type="checkbox"/> อื่นๆ	5.2 การบาดเจ็บที่ได้รับจากอุบัติเหตุ <input type="checkbox"/> ไม่มี <input type="checkbox"/> มี (สำหรับผู้ตอบว่ามี) <input type="checkbox"/> บาดเจ็บเล็กน้อยแต่สามารถทำงานได้ <input type="checkbox"/> บาดเจ็บรุนแรงต้องนอนพักรักษาตัวอย่างน้อย 3 วัน <input type="checkbox"/> บาดเจ็บรุนแรงต้องนอนพักรักษาตัวมากกว่า 1 เดือน	5.3 การสูญเสียจากการเกิดอุบัติเหตุ <input type="checkbox"/> ไม่มี <input type="checkbox"/> มี สำหรับผู้ตอบว่ามี <input type="checkbox"/> สูญเสียค่ารักษาพยาบาลเป็นจำนวนเงิน บาท <input type="checkbox"/> สูญเสียค่ายานพาหนะเป็นจำนวนเงิน บาท <input type="checkbox"/> สูญเสียค่าแรงงาน (ค่าจ้างต่อวัน) เป็นจำนวนเงิน บาท	5.4 หน่วยงานที่รับผิดชอบค่าใช้จ่ายในการเกิดอุบัติเหตุ <input type="checkbox"/> สำนักงานประกันสังคม <input type="checkbox"/> พรบ.ประกันภัยผู้ประสบภัยจากรถ <input type="checkbox"/> นายจ้าง <input type="checkbox"/> เจ้าของรถเอง
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<p>5.1 จำนวนครั้งของการเกิดอุบัติเหตุ ครั้ง</p> <p>ครั้งที่ 2. เกิดอุบัติเหตุเมื่อ วันที่..... เดือนพ.ศ..... เวลาน</p> <p>ลักษณะการเกิด () ขับรถชนประสาธน์กับรถคันอื่น, สิ่งของ () ถูกรถคันอื่นชน () รถไถลข้างถนน () อื่นๆ</p> <p>สาเหตุหลักของการเกิดอุบัติเหตุคือ</p> <p>สาเหตุรองของการเกิดอุบัติเหตุคือ</p>	<p>5.2 การบาดเจ็บที่ได้รับจากการเกิดอุบัติเหตุ</p> <p>() ไม่มี () มี (สำหรับผู้ตอบว่ามี) () บาดเจ็บเล็กน้อยแต่สามารถทำงานได้ () บาดเจ็บรุนแรงต้องนอนพักรักษาตัวอย่างน้อย 3 วัน () บาดเจ็บรุนแรงต้องนอนพักรักษาตัวมากกว่า 1 เดือน</p>	<p>5.3 การสูญเสียจากการเกิดอุบัติเหตุ</p> <p>() ไม่มี () มี สำหรับผู้ตอบว่ามี () สูญเสียค่ารักษาพยาบาลเป็นจำนวนเงิน บาท () สูญเสียค่ายานพาหนะเป็นจำนวนเงิน บาท () สูญเสียค่าแรงงาน (ค่าจ้างต่อวัน) เป็นจำนวนเงิน บาท</p>	<p>5.4 หน่วยงานที่รับผิดชอบค่าใช้จ่าย</p> <p>() สำนักงานประกันสังคม () พรบ.ประกันภัยผู้ประสบภัยจากรถ () นายจ้าง () เจ้าของรถเอง</p>
<p>ครั้งที่ 3. เกิดอุบัติเหตุเมื่อ วันที่..... เดือน .....พ.ศ..... เวลา .....น</p> <p>ลักษณะการเกิด () ขับรถชนประสาธน์กับรถคันอื่น, สิ่งของ () ถูกรถคันอื่นชน () รถไถลข้างถนน () อื่นๆ</p> <p>สาเหตุหลักของการเกิดอุบัติเหตุคือ</p> <p>สาเหตุรองของการเกิดอุบัติเหตุคือ</p>	<p>5.2 การบาดเจ็บที่ได้รับจากการเกิดอุบัติเหตุ</p> <p>() ไม่มี () มี (สำหรับผู้ตอบว่ามี) () บาดเจ็บเล็กน้อยแต่สามารถทำงานได้ () บาดเจ็บรุนแรงต้องนอนพักรักษาตัวอย่างน้อย 3 วัน () บาดเจ็บรุนแรงต้องนอนพักรักษาตัวมากกว่า 1 เดือน</p>	<p>5.3 การสูญเสียจากการเกิดอุบัติเหตุ</p> <p>() ไม่มี () มี สำหรับผู้ตอบว่ามี () สูญเสียค่ารักษาพยาบาลเป็นจำนวนเงิน บาท () สูญเสียค่ายานพาหนะเป็นจำนวนเงิน บาท () สูญเสียค่าแรงงาน (ค่าจ้างต่อวัน) เป็นจำนวนเงิน บาท</p>	<p>5.4 หน่วยงานที่รับผิดชอบค่าใช้จ่าย</p> <p>() สำนักงานประกันสังคม () พรบ.ประกันภัยผู้ประสบภัยจากรถ () นายจ้าง () เจ้าของรถเอง</p>

APPENDIX D**Items analysis**

Table 1: Number and percentage of driving anger of truck drivers.

Items	none at all	a little	some	much	very much
1. Someone is weaving in and out of traffic.	112 (28.0)	107 (26.8)	142 (35.5)	25 (6.3)	14 (3.5)
2. A slow vehicle on a mountain road will not pull over and let people by.	186 (46.5)	82 (20.5)	105 (26.3)	18 (4.5)	9 (2.3)
3. Someone backs right out in front of you without looking.	163 (40.8)	87 (21.8)	91 (22.8)	49 (12.3)	10 (2.5)
4. Someone runs a red light or stop sign.	325 (81.3)	31 (7.8)	32 (8.0)	10 (2.5)	2 (0.5)
5. You pass a radar speed trap.	371 (92.8)	13 (3.3)	13 (3.3)	3 (0.8)	0 (0)
6. Someone speeds up when your try to pass him/her.	185 (46.3)	89 (22.3)	89 (22.3)	27 (6.8)	10 (2.5)
7. Someone is slow in parking and is holding up traffic.	216 (54.0)	84 (21.0)	79 (19.8)	13 (3.3)	8 (2.1)
8. You are stuck in a traffic jam.	203 (50.8)	98 (24.5)	62 (15.5)	28 (7.0)	9 (2.3)
9. Someone makes an obscene gesture toward you about your driving.	17 (4.3)	237 (59.3)	146 (36.5)	0 (0)	0 (0)
10. Someone honks at you about your driving.	174 (43.6)	89 (22.3)	97 (24.3)	29 (7.3)	11 (2.8)
11. A bicyclist is riding in the middle of the lane and is slowing traffic.	161 (40.3)	96 (24.0)	108 (20.7)	29 (7.3)	6 (1.5)
12. A police officer pulls you over.	331 (82.5)	26 (6.5)	14 (3.5)	21 (5.3)	8 (2.1)

Table 1: Number and percentage of driving angers of truck drivers (continued).

Items	none at all	a little	some	much	very much
13. A truck kicks up sand or gravel on the car you are driving.	199 (49.8)	81 (20.3)	91 (22.8)	26 (6.5)	3 (0.8)
14. You are driving behind a large truck and you cannot see around it	332 (83.0)	32 (8.0)	31 (7.8)	5 (1.3)	0 (0)



Table 2: Number and percentage of truck drivers of driving angers classified by accidents(1) and non accidents(0)

(1) = Accidents at work

(0) = Non accidents at work

Items	group	none at all	a little	some	much	very much
1. Someone is weaving in and out of traffic.	1	16 (15.7)	29 (28.4)	44 (43.1)	8 (7.8)	5 (4.9)
	0	96 (32.2)	78 (26.2)	98 (32.9)	17 (5.7)	9 (3.0)
2. A slow vehicle on a mountain road will not pullover and let people by.	1	37 (36.3)	27 (26.5)	29 (28.4)	8 (7.8)	1 (1.0)
	0	149 (50.0)	55 (18.5)	76 (25.5)	10 (3.4)	8 (2.7)
3. Someone backs right out in front of you without looking.	1	38 (37.3)	28 (27.5)	21 (20.6)	12 (11.8)	3 (2.9)
	0	125 (41.9)	59 (19.8)	70 (23.5)	37 (12.4)	7 (2.3)
4. Someone runs a red light or stop sign.	1	83 (80.4)	10 (9.8)	7 (6.9)	2 (2.0)	1 (1.0)
	0	243 (81.5)	21 (7.0)	25 (8.4)	8 (2.7)	1 (0.3)
5. You pass a radar speed trap.	1	95 (91.3)	3 (2.9)	4 (3.9)	0 (0)	0 (0)
	0	276 (92.6)	10 (3.4)	9 (3.0)	3 (1.0)	0 (0)
6. Someone speeds up when your try to pass him/her.	1	44 (43.1)	23 (22.5)	21 (20.6)	9 (8.8)	5 (4.9)
	0	141 (47.3)	66 (22.1)	68 (22.8)	18 (6.0)	5 (1.7)
7. Someone is slow in parking and is holding up traffic.	1	50 (40.9)	26 (25.5)	20 (19.6)	2 (2.0)	4 (3.9)
	0	166 (55.7)	58 (19.5)	59 (19.8)	11 (3.7)	4 (1.3)
8. You are stuck in a traffic jam.	1	46 (45.1)	68 (66.7)	29 (28.4)	0 (0)	0 (0)
	0	157 (52.7)	72 (24.4)	40 (13.4)	21 (7.0)	8 (2.7)
9. Someone makes an obscene gesture toward you about your driving.	1	48 (47.1)	25 (24.5)	19 (1.6)	7 (6.9)	3 (2.9)
	0	0 (0)	12 (4.0)	169 (56.7)	117 (39.3)	0 (0)
10. Someone honks at you about your driving.	1	38 (37.3)	28 (27.5)	29 (28.4)	6 (5.9)	1 (1.0)
	0	126 (42.2)	64 (21.5)	78 (26.2)	22 (7.4)	8 (2.7)
11. A bicyclist is riding in the middle of the lane and is slowing traffic.	1	38 (37.3)	28 (27.5)	29 (28.4)	6 (5.9)	1 (1.0)
	0	123 (41.2)	68 (22.8)	79 (26.5)	23 (7.7)	5 (1.7)
12. A police officer pulls you over.	1	82 (80.4)	11 (10.8)	4 (3.9)	5 (4.9)	0 (0)
	0	249 (83.5)	15 (5.0)	10 (3.4)	16 (5.4)	8 (2.6)

Table 2. Number and percentage of truck drivers of driving angers classified by accidents(1) and non accidents(0)

(1) = Accidents at work

(0) = Non accidents at work (continued).

Items	group	none at all	a little	some	much	very much
13. A truck kicks up sand or gravel on the car you are driving.	1	50 (49.0)	24 (23.5)	23 (22.5)	5 (4.9)	0 (0)
	0	149 (50.0)	57 (19.1)	68 (22.8)	21 (7.0)	3 (1.0)
14. You are driving behind a large truck and you cannot see around it	1	82 (80.4)	8 (7.8)	10 (9.8)	2 (2.0)	0 (0)
	0	250 (83.9)	24 (8.1)	21 (7.0)	4 (1.0)	0 (0)

Table 3: Number and percentage of work ability index of truck drivers.

Items	Number	Percentages
1. How do you rate your current work ability with respect to the physical demands of you work?		
Very good	45	11.3
Rather good	83	20.8
Moderate	189	47.3
Rather poor	79	19.8
Very poor	4	1.2
2. How do you rate your current work ability with respect to the mental demands of you work?		
Very good	25	6.3
Rather good	208	52.0
Moderate	115	28.8
Rather poor	51	12.8
Very good	1	0.3
3. Number of current diseases diagnosed by a physician		
3.1. Digestive disease	23	5.9
3.2. Hypertension	11	2.8
3.3. Cardiovascular disease	5	1.4
3.4 Respiratory disease	5	1.4
3.1. Musculoskeletal disease	1	0.3
4. Sick leave during the past year (12 months)		
None at all	326	81.5
At the most 9 days	58	14.5
10 -24 days	7	1.8
25 – 99 days	7	1.8
100 – 365 days	2	0.5

Table 3: Number and percentage of work ability index of truck drivers (continued).

Items	Number	Percentages
5. Own prognosis of work ability two years from now		
Unlikely	320	80.0
Not certain	74	18.5
Relative certain	6	1.5
6. mental resources		
Have you recently been able to enjoy your regular daily activities?		
Often	210	52.5
Rather often	65	16.3
Sometimes	105	26.3
Rather seldom	16	4.0
Never	4	1.0
7. Have you recently been active and alert?		
Always	274	68.5
Rather often	31	7.8
Sometimes	78	19.5
Rather seldom	14	3.5
Never	3	0.8
Continuously	262	65.5

Table 4: Number and percentage of work ability index classified by accidents and non accidents.

- (1) = Accidents at work
- (0) = Non accidents at work

Items	Group	Number	Percentages
1. How do you rate your current work ability with respect to the physical demands of you work?			
Very good	1	10	9.8
	0	35	11.7
Rather good	1	12	11.8
	0	71	23.8
Moderate	1	60	58.8
	0	129	43.3
Rather poor	1	19	18.6
	0	60	20.0
Very poor	1	1	1.0
	0	3	1.0
2. How do you rate your current work ability with respect to the mental demands of you work?			
Very good	1	8	7.8
	0	44	14.7
Rather good	1	25	24.5
	0	90	30.2
Moderate	1	62	60.0
	0	146	40.9
Rather poor	1	7	6.9
	0	18	6.0
Very poor	1	0	0
	0	0	0

Table 4: Number and percentage of truck drivers of driving angers classified by accidents and non accidents.

(1) = Accidents at work

(0) = Non accidents at work (continued).

Items	Group	Number	Percentages
3. Sick leave during the past year (12 months)			
None at all	1	82	80.4
	0	244	89.1
At the most 9 days	1	18	17.6
	0	40	13.4
10 -24 days	1	1	1.0
	0	6	2.0
25 – 99 days	1	1	1.0
	0	2	0.7
100 – 365 days	1	0	0
	0	0	0
5. Own prognosis of work ability two years from now			
Unlikely	1	78	76.5
	0	242	81.2
Not certain	1	19	18.6
	0	55	18.5
Relative certain	1	5	4.9
	0	1	0.3

Table 4: Number and percentage of work ability classified by accidents and non accidents.

(1) = Accidents at work

(0) = Non accidents at work (continued).

Items	Group	Number	Percentages
6. mental resources			
Have you recently been able to enjoy your regular daily activities?			
Often	1	49	48.0
	0	161	54.0
Rather often	1	17	16.7
	0	48	16.1
Sometimes	1	31	30.4
	0	74	28.8
Rather seldom	1	5	4.9
	0	11	3.7
Never	1	0	0
	0	4	1.3
7. Have you recently been active and alert?			
Always	1	67	65.7
	0	207	69.5
Rather often	1	8	7.8
	0	23	7.7
Sometimes	1	22	21.6
	0	56	18.8
Rather seldom	1	5	4.9
	0	9	3.0
Never	1	0	0
	0	3	1.0

Table 4: Number and percentage of work ability index classified by accidents and non accidents

(1) = Accidents at work

(0) = Non accidents at work (continued).

Items	Group	Number	Percentages
8. Have you recently felt yourself to be full of hope for the future?			
Continuously	1	65	63.7
	0	197	66.1
Rather often	1	13	12.7
	0	33	11.1
Sometimes	1	20	19.6
	0	53	17.8
Rather seldom	1	3	2.9
	0	11	3.7
Never	1	0	0
	0	4	1.3

APPENDIX E

Relationship testing

1. The relationship between job characteristics and driving anger among truck drivers.

Variables	DAS		
	High	Moderate	Low
Distance driven			
≤ 200	10	105	69
> 200	7	132	77
	$\chi^2 = 1.49$	P= .474	
Hours driven			
≤ 10	13	200	119
> 10	4	37	27
	$\chi^2 = 1.06$	P= .586	
Number of trips			
≤ 4	1	12	12
> 4	16	225	132
	$\chi^2 = 1.54$	P= .463	
Resting hours			
≤ 0.5	10	96	63
> 0.5	7	141	83
	$\chi^2 = 2.25$	P= .323	
workplace			
Bangkok & metropolitan	5	76	46
Others	12	161	100
	$\chi^2 = .05$	P= .97	

2. The relationship between driving anger and work ability among truck drivers.

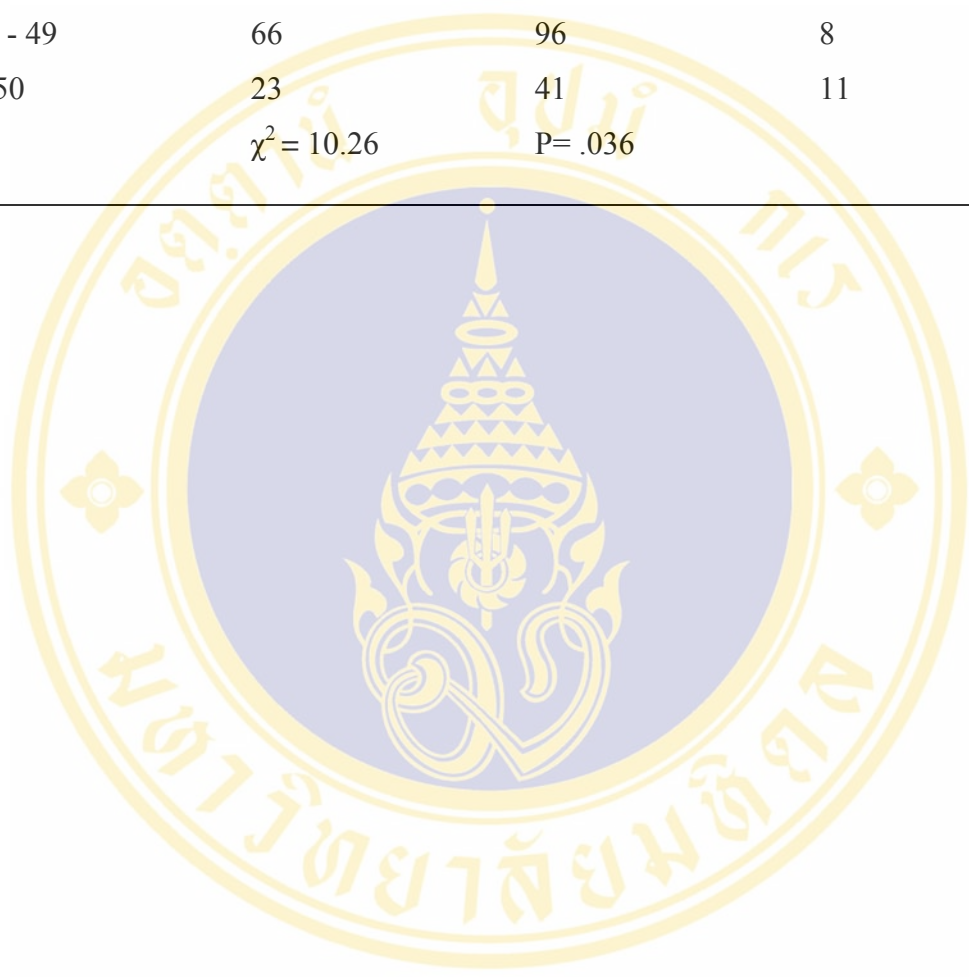
Driving anger	Work ability		
	Excellent	Good	Moderate
High	61	77	7
Moderate	73	145	20
Low	3	12	2
	$\chi^2 = 8.35$	P= .079	

3. The relationship between job characteristics and work ability among truck drivers.

Variables	WAI		
	Excellent	Good	Moderate
Distance driven			
≤ 200	69	101	14
> 200	67	134	15
	$\chi^2 = 2.1$	P= .341	
Hours driven			
≤ 10	112	197	23
> 10	24	38	6
	$\chi^2 = .435$	P= .805	
Number of trips			
≤ 4	9	15	1
> 4	127	200	28
	$\chi^2 = .427$	P= .808	
Resting hours			
≤ 0.5	65	92	12
> 0.5	71	143	17
	$\chi^2 = 2.64$	P= .266	

4. The relationship between age and work ability among truck drivers.

Age	Work ability		
	Excellent	Good	Moderate
≤ 35	47	98	10
35 - 49	66	96	8
> 50	23	41	11
	$\chi^2 = 10.26$	P= .036	



BIOGRAPHY



NAME	Pornlert Chumchai
DATE OF BIRTH	November 27, 1978
PLACE OF BIRTH	Srisaket, Thailand
INSTITUTIONS ATTENDED	Boromrajonani College of Nursing, Phra-Putthabat, 1998 – 2001 Bachelor of Nursing Science Mahidol University , 2004 – 2007 Master of Science (Public Health) Public Health Nursing
THESIS GRANT	The Thai Health Promotion Foundation (Thai health)
POSITION	Professional Nursing, 5 level
OFFICE	Medical Intensive Care Unit Department, Rajavithi Hospital
HOME & ADDRESS	19 Mo 9 P.Sumtatong T. Pran A. Khunhan Srisaket