OCCUPATIONAL HEALTH RISK OF INFORMAL WORKERS IN BANGKOK

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OCCUPATIONAL HEALTH RISKS FOR INFORMAL WORKERS IN BANGKOK

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ABSTRACT

The aim of this study was to assess the occupational health risks for informal workers in Bangkok. Data were collected by questionnaire among 300 taxi drivers, motorbike taxi drivers, hairdressers, and tailors. Statistical analyses used were frequency distribution, mean, percentage, standard deviation, the range of maximum and minimum values, and multiple comparison.

There were 130 male informal workers (43.3 percent) and 170 female informal workers (56.7 percent). The data from taxi drivers and motorbike taxi drivers showed risks in working conditions came from poor working posture followed by dust exposure, and they had the highest number of work-related accidents which were traffic accidents at 60 percent and 66.7 percent, respectively. The severity of accident was mostly slight, whereas safe work behavior was mostly moderate. There were no difference in safe work behavior among taxi drivers and motorbike taxi drivers. The highest frequency risk in working conditions for hairdressers was poor working posture followed by usage of chemical substances. The most common accident was cutting injuries at 28.0 percent. The safe work behavior of hairdressers was significantly different from that of taxi drivers and motorbike taxi drivers at $p < .05$. The highest frequency risk in working conditions for tailors was poor working posture followed by dust exposure. The most common accidents were finger injuries by scissors and injuries from needles followed by electrical shocks. The safe work behavior of tailors was significantly different from that of taxi drivers and motorbike taxi drivers at $p < .05$.

It can be concluded that the occupational health risks for informal workers: taxi drivers, motorbike taxi drivers, hairdressers, and tailors were not different. The cause of occupational health risk was different depending on the difference in working protocols among informal worker groups. This study confirmed the occupational health problems found in these workers; therefore, appropriate health care service must be provided to these informal workers.

KEY WORDS: INFORMAL WORKERS / OCCUPATIONAL HEALTH RISK / SAFE WORK BEHAVIOR AND HEALTH CARE SERVICE

113 pages

ความเสี่ยงด้านสุขภาพที่เกิดจากการทำงานของแรงงานนอกระบบในเขตกรุงเทพมหานคร
OCCUPATIONAL HEALTH RISK OF INFORMAL WORKERS IN BANGKOK

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ เพื่อประเมินความเสี่ยงทางด้านสุขภาพในการทำงานของแรงงานนอกระบบในกรุงเทพมหานคร จำนวนทั้งสิ้น 300 คน ในกลุ่มอาชีพขับรถแท็กซี่ ขับรถมอเตอร์ไซด์รับจ้าง กลุ่มช่างเสริมสวยและกลุ่มตัดเย็บเสื้อผ้า วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ได้แก่ การแจกแจงความถี่ ค่าเฉลี่ยร้อยละ ส่วนเบี่ยงเบนมาตรฐาน ค่าสูงสุด ค่าต่ำสุด ทดสอบความแตกต่างของค่าเฉลี่ย

ผลการศึกษาพบว่ากลุ่มตัวอย่างแรงงานนอกระบบเป็นเพศชาย 130 คน คิดเป็นร้อยละ 43.3 และเป็นเพศหญิง 170 คน คิดเป็นร้อยละ 56.7 โดยส่วนใหญ่ของกลุ่มขับรถแท็กซี่และขับรถมอเตอร์ไซด์รับจ้างมีความเสี่ยงจากสภาพแวดล้อมการทำงานเนื่องจากท่าทางการทำงาน และรองลงมาคือการรับสัมผัส ฝุ่นละออง กลุ่มขับรถแท็กซี่และขับรถมอเตอร์ไซด์รับจ้างเกิดอุบัติเหตุสูงสุดจากยานพาหนะ คิดเป็นร้อยละ 50 และ 66.7 ตามลำดับ ระดับความรุนแรงของการเกิดอุบัติเหตุส่วนใหญ่อยู่ในระดับเล็กน้อย โดยพฤติกรรมด้านความปลอดภัยของกลุ่มแท็กซี่และมอเตอร์ไซด์รับจ้างไม่แตกต่างกัน ส่วนใหญ่ของกลุ่มช่างเสริมสวยมีความเสี่ยงจากสภาพแวดล้อมการทำงานสาเหตุจากท่าทางการทำงานและรองลงมาจากการใช้สารเคมี และอุบัติเหตุส่วนใหญ่เกิดจากการโดนของมีคมบาด คิดเป็นร้อยละ 28.0 พฤติกรรมด้านความปลอดภัยของช่างเสริมสวยมีความแตกต่างกับกลุ่มขับรถแท็กซี่และกลุ่มขับรถมอเตอร์ไซด์รับจ้าง มีนัยสำคัญทางสถิติที่ 0.05 ส่วนใหญ่ของกลุ่มตัดเย็บเสื้อผ้ามีความเสี่ยงจากสภาพแวดล้อมในการทำงานเนื่องจากท่าทางการทำงานรองลงมาคือฝุ่นละอองจากเส้นใยผ้า และอุบัติเหตุส่วนใหญ่เกิดจากของมีคมบาดและทิ่มแทง พฤติกรรมความปลอดภัยของกลุ่มตัดเย็บเสื้อผ้ามีความแตกต่างกันระหว่างกลุ่มขับแท็กซี่และมอเตอร์ไซด์รับจ้าง มีนัยสำคัญทางสถิติที่ 0.05

จากการศึกษาสามารถสรุปว่าความเสี่ยงด้านสุขภาพในการทำงานของแรงงานนอกระบบกลุ่มขับรถแท็กซี่ มอเตอร์ไซด์รับจ้าง กลุ่มช่างเสริมสวยและช่างตัดเย็บเสื้อผ้าไม่แตกต่างกัน ขณะที่อันตรายจากขั้นตอนแต่ละขั้นตอนของการทำงานนั้นมีความแตกต่างกันตามสาเหตุของความเสี่ยงจากการทำงานมีความแตกต่างกันตามลักษณะการทำงานที่แตกต่างกัน

การศึกษายืนยันปัญหาสุขภาพที่พบจากความเสี่ยงในการทำงาน ดังนั้นแรงงานนอกระบบยังต้องการการดูแลสุขภาพที่เหมาะสมตามลักษณะการทำงานที่แตกต่างกัน

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CHAPTER I
INTRODUCTION

1.1 Background and significance of the study

Thailand is a developing country with business competition, expansion and employment in both production sector and services sector. In the past, most of production from Thailand is from agricultural sector and now it is rapidly changed to be from industrial sector. There are two groups of labour force in the production sector : formal workers and informal workers from rural area. The informal economic is known as "informal sector".(1) In the economic developing countries labour is divided into two categories – which consisted of 1) formal workers and 2) informal workers as mentioned eelier. The informal workers has no labour protection measure, which are the government's law or regulation and whereas the welfare system are not covered unlike for the formal workers. The informal workers generally consisted 2 group – 1)got jobs and were or employed, some of them work at home, in the agricultural field and fishery 2) were independent self employed such as taxi drivers, beauticians, hairdressers, shoemakers, retailers and watchmakers etc (2). Office of the National Economic and Social Development board divides informal workers into 4 group- which consisted of 1) production such as agriculture, work at home, independence employed, 2) commerce and service such as peddler, antiquaire , maintenance and service 3) logistic such as motorbike taxis, taxi drivers 4) activity in family such as child care by unpaid family workers.(3)

Informal workers have importance role in the economic Thailand's gross domestic product, despite the economic activity of informal workers cannot demonstrate size of activity but it have a relation to develop economic.

According to the National Statistical Office Thailand in 2011(4) found among the total of 39.3 millions workers, there were 14.7 millions (37.4%) formal workers and 24.6 millions (62.6%) informal workers consisted of 13.2 millions male informal workers and 11.4 millions female informal workers. (figure 1.1)

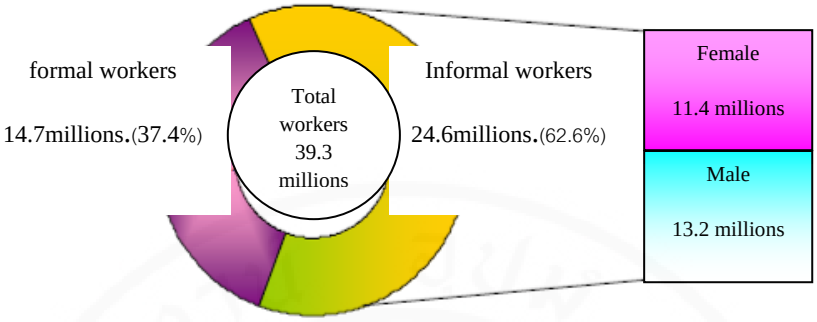


Figure 1.1 Total of workers in Thailand in 2011

Majority of informal workers was in northeast region of Thailand followed by north region, central region, south region and Bangkok.(figure 1.2)

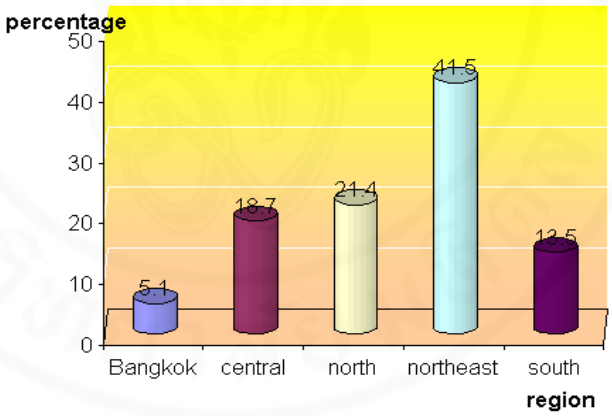


Figure 1.2 The percentage of informal workers classified by the region

Related to the level of education of informal workers, most of informal workers had been educated in primary school and under than primary school (65.1%) followed by secondary school (27.2%) and bachelor degree (6.9%). Most of informal workers are agriculture field (61.4%) followed by working in services and commerce sector (29.7%) and working in production sector (8.9%). The number of informal workers and formal workers are different in agricultural sectors as show in figure 1.3.

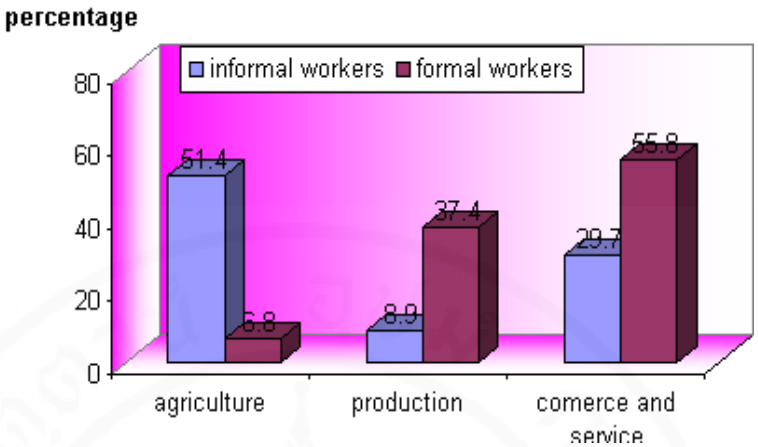


Figure 1.3 The informal workers and formal workers divide by the economic sector

A study in 2011 showed the reason of injury and accident among informal workers, it was from work. They found 3.7 millions informal workers were had accident and injured from work. The majority of injured from cut or wounded by sharp materials (67.3 %) followed by fall on same level (12.3 %), crash and against (8.7 %), burn or scald (4.8 %), exposed to chemical substance (3.0 %), vehicle (2.9 %), and electricity (0.6 %), It higher than last year. (figure 1.4)

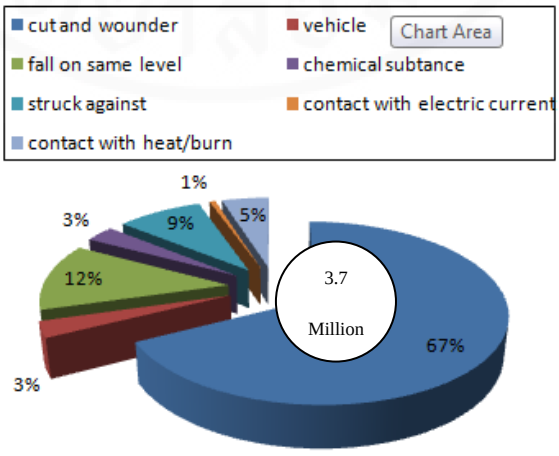


Figure 1.4 The percentage of informal workers classified by types of injured and accident

The problem of occupational safety and health (OSH) of informal workers were exposed to chemical substance (65 %) followed by machine and tools (21 %) and the injury of eyes and ears (6.1 %). The problems of poor working condition were to working posture, prolong working in the same posture (44.2 %) followed by exposed to dust, mist, smoke (17.8 %) and low lighting (17 %).(figure 1.5)

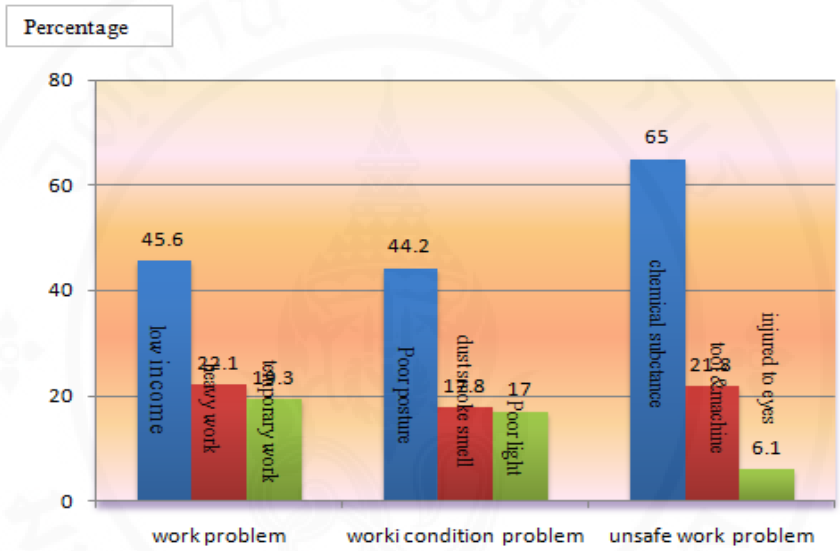


Figure 1.5 The problem found in informal workers in percentage.

The research study of informal workers conducted in Chaingmai ,the informal workers consisted of two group: one group working at home group such as handcrafts, carves, sawing bag and clothes, beads and paper flowers and the another group such as sellers and drivers. The results of this study found of informal workers were an uncertain work schedule, working in poor condition. Informal workers need to health protection and urgent need for developing labour protection from the government. [5] The problem of sewer female informal workers in Khonkan province reported the health problem of working in poor conditions and lack of health welfare [6] as same as informal workers in Doysaket, Chaingmai found the OSH problems were working in poor working environment and health problems in respiratory and the highest problem in ergonomic from related-work for prolong working in the same posture and they did not used PPE.[7] The OSH problems of informal workers in Phuket province were lacking of knowledge for safe working conditions and lack of

safety training. They used the chemicals in processes but they don't know well about chemical substance. They had fatigued and pain related-work and treat by massage and no treatment. [8]

The occupational health risk in taxi drivers were to poor posture example for prolong sitting in cab is a caused of neck, shoulder and back pain, heavy manual lifting such as overload luggage[9] , exposed to dust and chemical substance from exhaust pipe [10] .

The problems of motorbike taxis were to prolong working than 8 hours/day. The health problems and diseases were allergy, asthmas, cataracts and hypertension. Most of them never had annual physical check-up and not exercise. They visited hospital and used the Universal Coverage Scheme (Gold card) when seriously ill and they were not covered by social welfare, no holiday, uncertain working and prolong work.[11]

The study of occupational health risks and health problems in hairdressers were found skin disorders, fingers injured caused by scissors, hand dermatitis caused by used shampoo, exposed to chemical substance is a caused of eye irritation and rash skin.[12] The chemical substance such as shampoo, waving, dyeing[13], hair spray , hair bleach is a caused of asthma disease [14], neutralizer, conditioners, peroxide solution, styling gel, setting lotion, mouse, relaxer and nail polish remover [10] The ergonomic problem that showed in Taiwan hairdressers had a wrists pain caused by hair cutting, washing and blow-drying.[15] The health problem of nail salon were the exposed to chemical substance such as formaldehyde, methyl methacrylate (MMA), solvents (Acetone, methyl, ethyl, ketone, xylene and toluene)[16]

From the above information, it is shown that informal workers need to receive health service from health care unit and need to social welfare from government. Taxi drivers in Bangkok had a knowledge in social welfare [17]as same as in motorbike taxi in Jatujak district.[11] The success approach of health protection and social welfare of informal workers were consisted – health promotion, good employed, protection measure for accident and disease related-work, should to established OSH organization health care in local government.[12]

The developing health services and health promotion for informal workers need to a participatory approach to improved workplace by leader of informal

workers.[13] The model used to improve health care service had 7 steps 1) Improve health team 2) survey and health evaluation 3) social analysis 4) planning 5) follow up 6) monitoring 7) Information feedback. OSH promotion guidance should to include 2 activities: awareness and OSH team or OSH organization. [14]

The result OSH problems from related-work of informal workers were no permanent employment status, uncertain in career, accident and disease related-work, lack of health surveillance. Now many health organizations were interested in OSH problem of informal workers for example the National Health Security Office branch 13 who responsible for the people living in Bangkok. They don't coverer informal workers especially in health problems related to occupation risk. Even their duty aims at health promotion and prevention diseases regarding preventive measures.

Therefore, the aim of this research study was to study occupational health risk and health problem of informal workers in Bangkok. The accessibility for health care service for informal workers in Bangkok would be analyzed.

1.2 General objective

To study occupational health risk and health problem of informal workers in Bangkok: Case studies of taxi drivers, motorbike taxi, hairdressers and tailors.

1.3 Specific objectives

1) To assess the occupational health risk of informal workers in Bangkok: Case study in taxi drivers, motorbike taxi, hairdressers and tailor.

2) To study in the health status, safe work behaviors caused of work-related accident and illness and health problem in working.

3) To study in health service data, which were not covered in work-related diseased of informal workers.

1.4 Research scope

To study in the health second data from guidance health promotion and prevention disease and dental manual of The National health security office branch 13 in Bangkok (2012) and National health security manual (2011). The data were collected by questionnaires and Job safety analysis (JSA). The population of this study was lived in Bangkok and has the careers in 4 groups which consisted – taxi drivers, motorbike taxi, hairdressers and tailor. They were under of center informal workers of institute occupational health and safety, Faculty Public health, Mahidol University. Data was collected between June-August 2556.

1.5 Definition of terms

1) The informal worker is a work who does not work in the factory, they self-employed workers. They worked with the center for informal workers, department of occupational health and safety, Faculty Public health, Mahidol University .

2) Job Safety analysis (JSA) is the method of job safety investigation of by breaking the process of job down into a sequence of steps from beginning to the final step of finish work task in order to identify potential hazards and prevention measure.

3) Risk assessment is risk evaluation method by introducing questionnaires. The questionnaire was developed by the Bureau of occupational and environmental disease, Department of disease control and expert professionals.

4) Risk is the probability to occurred work-related accidents and illness in workplace.

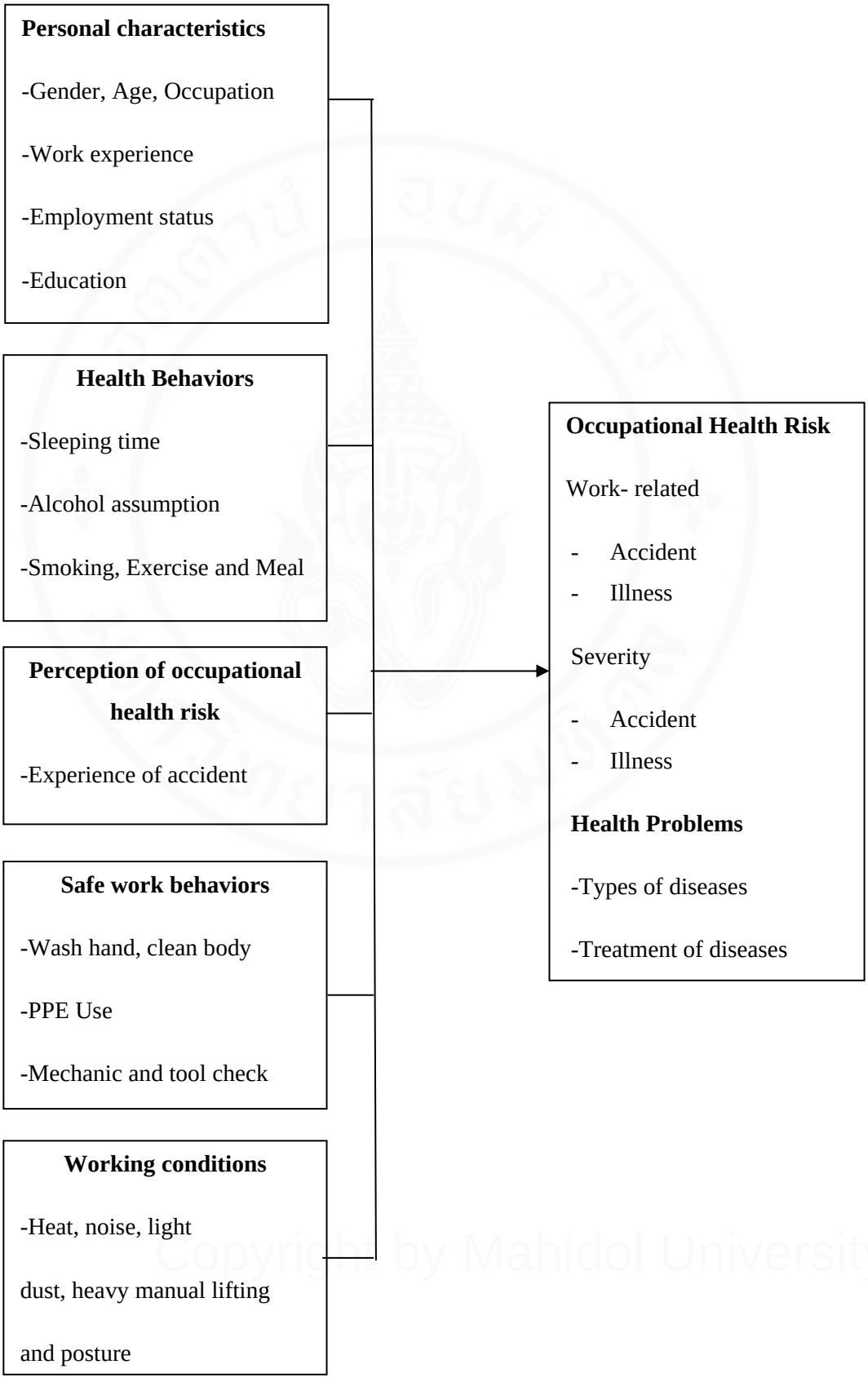
5) Occupational health risk is the risk caused from work or accident, working conditions, and illness related to work.

6) Safe work behaviors is working behaviors such hand washing before eat, body clean after finish work, PPE Used, check mechanic and tool before work.

7) Working condition problem is heat, light, noise, dust, heavy manual lifting and posture might cause health problem.

8) Health behaviors are the general behaviors of workers such as sleeping time, alcohol assumption, smoking, meal and exercise of informal workers.

1.6 Conceptual framework



CHAPTER II
LITERATURE REVIEWS

The objective of this research was to study occupational health risk and health problem of informal workers in Bangkok: Case study of taxi drivers, motorcycle riders, hairdressers and tailors. This chapter provides information regarding theories and relevant research related to occupational health risk and health problems. They were in 5 parts presented as follows:

Part 1 : The definitions of informal workers ,health and health promotion

Part 2: The guidance health promotion and prevention disease and dental manual of The National Health Security Office branch 13 in Bangkok (2011,2012)

Part 3 : Job working Environmental factors

Part 4 : Job safety Analysis Techniques

Part 5 : Literature review

2.1 Part 1 : The definitions of informal workers ,Health and health promotion

2.1.1 Informal workers

There are many definition of informal workers issued from many organizations,

2.1.1.1 Informal workers are worker who has an employment of informal economic sector is a small enterprise such as a family business used a raw materials in urban. They are normally provided physical labour skill labour and, using a simple technology such as a group of peddler, shoemakers, rubbish workers, maid, and home workers. (2)

2.1.1.2 ILO provides the poor working conditions and is associated with increasing poverty. Some of the characteristic features of informal employment are lack of protection in the event of non-payment of wages, compulsory overtime or extra shifts, lay-off without notice or compensation, unsafe working conditions and the absence of social benefit such as pension, sick pay and health insurance.

2.2.1.3 National statistic office Thailand (2011) provides that the informal workers does not have any employment security and has no protection and benefit from their employers.

2.2.1.4 Narumol N.(2550) provides that the informal workers, who don't have any labour protection, social security and welfare provide from government. They don't have stable income such as agriculture, fishery, temporary workers or partime workers, home workers, freelance workers and home-base workers.

2.1.2 Health

To give meanings of health from WHO, it provide health is a state of health complete physical, mental, and social well being and not merely the absence of disease or infirmity. An important consequence of this definition is that mental health is described as more than the absence of mental disorders or disabilities.

2.1.3 Health promotion

The Ottawa charter, WHO and Professional health give the meaning of health promotion as follows: [18]

2.1.3.1 The process to increase the personal skill to control all of factors to have health effect and develop health for well being.

2.1.3.2 Give an authority to make decision and conduct health management for human by themselves all of activities to have health effect.

2.1.3.3 This activity beyond to change social environment and economic in order to reduce health effect of human and health public.

2.1.3.4 To manage the benefits source such as education, social and environmental to help the good behaviors and reduce risks diseases.

2.1.4 Determinants of mental health

The World Health Organization provide determinants of mental health such as Multiple social, psychological, and biological factors determine the level of mental health of a person at any point of time. For example, persistent socio-economic pressures are recognized risks to mental health for individuals and communities. The clearest evidence is associated with indicators of poverty, including low levels of education.

There are also specific psychological and personality factors that make people vulnerable to mental disorders. Lastly, there are some biological causes of mental disorders including genetic factors and imbalances in chemicals in the brain.

They also provide the strategies and interventions for mental health promotion involve actions to create living conditions and environments that support mental health and allow people to adopt and maintain healthy lifestyles. These include a range of actions to increase the chances of more people experiencing better mental health and include mainstreaming mental health promotion into policies and programs in government and business sectors including education, labour, environment, housing, and welfare, as well as the health sector.

2.2 Part 2: The guidance health promotion and prevention disease and dental manual of The National health security office branch 13 in Bangkok (2012,2012)

2.2.1 The structure of health service system and referral system. [19]

2.2.1.1 Primary care unit this service is foundation health service, a first contact unit to service for people. Health service and public health care implement by health public officer and medical physician such as Tambol health promotion hospitals, health service of municipality center, out-patient of all public and private management hospitals and drugstores.

2.2.1.2 Secondary care unit- this service is using medical technology higher than primary health care unit especially in medical service by

physician specialist such as community hospital, general hospital, hospital center, public and private management hospital.

2.2.1.3 Tertiary care unit, this is an advance medical service and medical technology, specialist physician, public health officers such as hospitals, regional hospitals, hospital of university and private management hospitals.

2.2.2 Structural management of National Health Security Office

National Health Security office (NHSO) divide the structures management of NHSO system into 2 groups – which consisted of National Health Security Officer 13 regional (Including head quarter Bangkok) and National Health Security office branch, which is responsible in management system in own area. National Health Security office provinces are responsible in health security management provincial as follows by policy and duties assigned by the national health security Boards and sub-committee. [20]

2.2.3 Responsibilities of structural management in area level

Since 2009 , Responsibilities of National Health Security Office, branch is importance to move performing and duties in the future by autonomy and harmonize to participation management health service to build up the connection in area from primary health care to tertiary health care. The mission is responsible in people right to health service and provides the fund for expense in health service and to developed health service management system.

2.2.4 The Role and Responsibilities of National Health Security Office branch

The National Health Security Office branch has important responsibilities for people living in the specified area, for example the branch 13 is responsible for Thai people living in Bangkok. The roles are mentioned as follows;

2.2.4.1 To enroll of health service facilities, provide network of health care units and referral. To conduct evaluation enrolled standard of health facilities and network of health care units to enjoy health service for the personal

rights in health security service under rules, procedures and condition ad prescribed by the Board (Acts 44)

2.2.4.2 To promote developing and control quality standard of health care unit network such as hospital and clinic and other association organization, which provide controlling standard and quality service for the personal rights by beneficiaries which shall be as prescribed by the Board.

2.2.4.3 To promote participation of communities and local governments by management and support NHSO provincial in these activity as follows.

- Provide knowledge in health security system for people rights.

- Provide the space for discussion; exchange the opinion between receives health service and NHSO provincial about health security service system.

- Support health promotion activities for communities and local governments.

- Provide system data network for communities and local governments and connection data network with other administration organization.

- To establish participation with multilaterals in the locality include the government sector and private sector to support and provide health security.

2.2.4.4 To build up the protection the right people and support the health promotion activity with the head office as follows;

- Promote and protect the people’s right to health security as well as reinforce the learning process to the public in realizing their rights and duties.

- Inform the health data to people for decision and selected health care unit.

- Provide and develop quality health care system.

2.2.4.5 The provide compensation management service.

2.2.4.6 To manage the fund in health service.

- Pay service expenses for personal right and to manage the fund for treatment as prescribed by the National health Security Board.

- To manage the fund for health promotion and disease prevention.

- To manage the especially fund such as the fund for disability and emergency illness fund.

- To manage the fund for compensation and repair and the fund for develop primary health care unit to such rules, procedures and conditions as prescribed by the Board.

2.2.4.7 To support health duties activity for health service system and national health security office branch or vicinity provincial as follows:

- Registering and provide network of health care units. To plan for registering of health care unit and develop registering system vicinity province level to support National Health Security Office branch. Service free register data for people and association administration organization and combined with committee to evaluation and monitoring the result of register health service system according to commitment or agreement of health care unit in province.

- Registering for people right to health service, to perform the registration management system, evaluation and monitoring register system provincial level and provide for people choosing health care unit.

- To develop and quality control health care unit and network of health care unit as responsibilities in collected the service quality data and evaluation. To establish reports implementation and evaluation for the National Health Security Office, branch, including monitoring quality of service by collected and analysis information concerning the implementation of health care unit and network of health care unit in province.

- Promote participation of communities and local government and to manage the social security fund and participation with the National Health Security Office such as provide venue for discussion and support health activity with local government and communities.

- Protect the people rights, convenience complaining and public relations and to established the petition administration organization vicinity province.

- Compensation and medical audit by keep evidence expense and provide data system of vicinity province to support the expense of health service in health care unit and network of health care unit and provide committee for supervise as followed by the National Health Security Board.

- To manage the fund for health security provincial by provide planning and projects followed rules, procedures and conditions as prescribed by the Board and provides report regularly every 3 month.

- To support duties of The National Health Security office and join to sub-Committee of Health Security province to control the quality service.

2.2.5 Type and limits of people rights

National Health Security Act B.E.2545 (A.D.2002) Section 5 " The Thai population shall be entitled to a health service with standards and efficiency as prescribed in this Act."

2.2.5.1 Cost of public health service in security health system

Cost of health promotion and diseases prevention covers medical and health service in order to provide for health promotion and diseases prevention for people. It proven by academic found had benefits and effectively such as Thai people have and average age more than, make the quality of life, reduce illness rate and deformation. The cost aim for health promotion and diseases prevention were to 1) screening diseases and risk, 2) for change the behaviors, consultation, provide knowledge of health promotion and diseases prevention 3) Immunizations, drugs and operation for health promotion and diseases prevention as follow; [21]

- Checking and health service, child development and nutrition follow guidance of department of health, public health ministry or guidance of health check up of people right as prescribed by the medical Council of Thailand.

- Promote immunization according to the national immunization program.

- Support for annual physical health check up by high risk group according to Thai physical check up manual right as prescribed by the medical Council of Thailand.

- Family planning service according of Department of Health, Ministry of public Health and Thai physical check up manual right as prescribed by The medical Council of Thailand.

- Antiretroviral medications for the prevention of mother-to-child transmission of HIV.

- Home visit and home health care.

- Health counseling and provide of knowledge for health promotion and disease prevention for people and family and support for people's participation in health promotion.

- Health promotion and protection dentistry services.

- Check for dental service.

- Counseling for dentistry.

- Give fluoride for child.

- Old man and patient treat by radiation to throat and head.

- Medical examination diagnosis and cover to check for diagnosis and check for confirm.

2.2.5.2 Examination and pre-natal care for pregnant women and cover to health promotion for pregnant women as prescribed by Department of Health, Ministry of public Health and ILO.

2.2.5.3 Curative cost and medical service cover for

- Curative cost and medical examination diagnosis treatment end and including Thai traditional and alternative medicine service as recognized by the medical registration committee and treatment disabled or mental health patients, and treatment kidney disease and chronic renal failure by peritoneal dialysis and hemodialysis or renal transplantation.

- Curative cost and dentistry services such as extraction, filling, scaling, plastic-based denture, milk – tooth nerve-cavity treatment and placement of artificial palate in children with harelip and cleft palate.

2.2.5.4 Medicine, medical supplies, organ substitutes and medical equipment followed by indication of medical. It is followed by National List of Essential Medicines and include of medical for anti HIV drugs.

2.2.5.5 Childbirth, cover delivery, totally for no more than two times.

2.2.5.6 Meal and room charges for patients in common room.

2.2.5.7 Newborn and child care.

2.2.5.8 Delivery and Ambulance of transportation for patients to hospital.

2.2.5.9 Physical and mental rehabilitation and including to restoration physical medical for finish treat.

2.2.5.10 other expenses necessary for the health service as prescribed by the Board.

2.2.6 The universal coverage scheme

The annual report of Health Security Office provide the UC global (Universal coverage) budget divided into 12 subcategories: outpatient general services (OP);inpatient general services (IP); health promotion and disease prevention services (PP);central reimbursement (high cost care and accident and emergency care); emergency medical services (EMS), service for the disabled; capital replacement; flexible fund for specific facilities; no-fault liability; health personnel injury compensation; pay for performance and budget for alternative and traditional medicine.

The detail of each payment categories are as follows; [22]

2.2.6.1 Most of general OP budget paid prospectively on a capitation basis with age adjustment to the contracting units of primary care (PCU). Referred OP cases would be reimbursed by PCU according to fee schedule or contracted agreement with referral health facilities.

2.2.6.2 The general inpatient general services budget was reimbursed by diagnosis related group (DRG) version 4 under global budget at NHSO regional level.

2.2.6.3 The health promotion and disease prevention services budget paid for health promotion and disease prevention services for all Thai people. It divided into four parts. The first part was managed at national level for vertical programs e.g. national immunization program. The second part was for prevention and

promotion of community-based services. The third part was for health promotion and illness prevention at health care facilities e.g. annual physical health check-up. The forth part was for regional specific health prevention projects.

2.2.6.4 The central reimbursement budget was reimbursed for specific high cost items of OP and IP services e.g. coronary angiography and prosthetic heart valve. Accident and emergency care would also be reimbursed under this subcategory to the providers. Pay for fee schedule according to specified payment criteria was paid for disease management initiatives and special services. Those were Leukemia, lymphoma, cleft lip and cleft palate, open heart surgery, haemophilia, cataract extraction, surgery in epilepsy patients, urgent treatment in stroke fast track, bone marrow transplantation in children and secondary prevention for Diabetes Mellitus.

2.2.6.5 The emergency medical services budget was initiated to increase accessibility to pre-hospital care that was poorly developed. A part of the budget was for EMS system development, and the other part was for claim reimbursement using fee schedule.

2.2.6.6 The disability budget was aimed to increase access to rehabilitation services for the disabled. Fee schedule under global budget was adopted for payment of services, instruments, and prosthesis.

2.2.6.7 The capital replacement budget was administered mainly for maintenance. Therefore, at least 75 percent of this subcategory was allocated for the preventive maintenance and the replacement of the durable goods and building.

2.2.6.8 The no-fault liability fund was a fund developed under Section 41 of the National Health Security Act comprising no more than 1% of the total health security fund. In case of any medical injuries, patients could apply for compensation to the provincial committee. The compensation would be paid in accordance with the criteria established by the National Health Security Board.

2.2.6.9 The health personnel injury compensation fund was set as a preliminary compensation for the health personnel suffering from injury and illness due to their medical service provision and performance.

2.2.6.10 Pay for performance fund aimed at the quality improvement of health facilities in primary care level and upper level. Composite scores of key performance indicators were collected to assess the performance.

2.2.6.11 Alternative and traditional medicine budget was designed to support Thai traditional medicine e.g. Thai massage treatment and physical rehabilitation.

2.3 Part 3: Working Environmental Factors

The working environment factors cause health effect illness, sickness and significant discomfort in workers can be classified as chemical, physical, biological and ergonomic hazards. Barbara A. Plog and Patrical J. Quinlan, they said that in Fundamentals of Industrial Hygiene as follows; [23]

2.3.1 Chemical hazards

The majority of occupational health hazards came from inhaling chemical agents is the form of vapors, gases, dusts, fumes, and mists.

The recognize occupational factors or stresses, a health and safety professional must first know about the chemicals used as raw materials and the nature of the products and by-products manufactured. The Materials Safety Data Sheet (MSDS) must be supplied the chemical manufacturer.

Breathing of some materials can irritate the upper respiratory tract or the terminal passages of the lungs and the air sacs, depending upon the solubility of the material. Some substances may affect the central nervous system and brain to produce narcosis or anesthesia. In addition to the irritants with the skin surface can produce various kinds of dermatitis.

States of Matter

Matter is divided into dusts, fumes, smoke, aerosols, mists, gases, and vapors. These are discussed in the following;

2.3.1.1 Dusts are solid particles by handling, grinding, crushing, detonation, rapid impact, and decrepitating of organic or inorganic materials,

such as metal, wood, rock, ore, coal, and grain. Term of dust is used in industry to describe airborne solid particles that range in size from 0.1-25 μm in diameter. Dust more than 5 μm in size usually do not remain airborne long enough to present and inhalation problem. A person with normal eyesight can detect dust particles as small as 50 μm in diameter. Smaller airborne particles can be detected individually by the naked eye only when strong light is reflected from them.

2.3.1.2 Fumes are formed when the material from a volatilized solid condenses in cool air. The solid particles that are formed make up a fume that is extremely fine, usually less than 1.0 μm in diameter. Gases and vapors are not fumes, although the terms are often mistakenly used interchangeably. Metalizing, welding, and other operations involving vapors from molten metal may produce from fumes; these may be harmful under certain conditions. Arc welding volatilizes metal vapor that condenses as the metal or its oxide in the air around the arc. Other toxic fumes, such as those formed when welding structures that have been painted with lead-based paints or when welding galvanized metal.

2.3.1.3 Smoke is consisted of carbon or soot particles less than 0.1 μm in size, and results from the incomplete combustion of carbonaceous materials such as coal or oil. Smoke generally contains droplets as well as dry particles, tobacco, for instance, produces a wet smoke composed of minute tarry droplets.

2.3.1.4 Mist is suspended liquid droplets generated by condensation of liquids from the vapor back to the liquid states. The term mist is applied to a finely divided liquid suspended in the atmosphere, such as the oil mist produced during cutting and grinding operations, acids mists from electroplating, paint spray mists in painting operations, and the condensation of water vapor to form a fog or rain.

2.3.1.5 Gases are formless fluids that expand to occupy the space or enclosure in which they are confined and gases are state of matter in which the molecules are unrestricted by cohesive forces, such as arc-welding gases, internal combustion engine exhaust gases, and air.

2.3.1.6 Vapor is the volatile form of substances that are normally in the solid or liquid states at room temperature and pressure. Evaporation is

the process by which a liquid is changed into the vapor state and mixed with the surrounding atmosphere.

2.3.1.7 Solvent was arising from the use of solvents. Solvent vapors enter the body mainly by inhalation, although some skin absorption can occur. The vapors are absorbed from the lungs into the blood and are distributed mainly to tissues with a high content of fat and lipids, such as liver, the central nervous system, and bone marrow. Solvents include aliphatic and aromatic hydrocarbons, ketones, alcohol, chlorinated hydrocarbons, aldehydes, and carbons disulfide.

Hsiao S. and Yu Wen L., they studied hairdressers who used hair dye and hair bleach in Taiwan, it was found that the chemical of hair dye components, such as p-phenylenediamine (PPD) and aminophenol isomers caused skin irritation and contact allergies are skin disorders. [24]

Manuela Gago D.et.al, found that exposure to hair dye was associated with increased risk in bladder cancer and associated with the working experience, in hairdressers, who had experience more than 10 years. [25]

2.3.2 Physical Hazards

Barbara A. Plog and Patrical J. Quinlan, demonstrated in the Fundamentals of Industrial Hygiene [24] that the physical hazards include excessive levels of noise, vibration, nonionizing radiation, ionizing radiation, and extremes of temperature and pressure.

2.3.2.1 Noise is a form of vibration conducted through solids, liquids and gases. The effects of noise on human including as follows;

- Psychological effects (startle, annoy, and disrupt concentration, sleep, and relaxation)

- Interference with speech communication and, as a consequence, interference with job performance and safety.

- Physiological effects (noise-induced hearing loss, or aural pain when the exposure is severe)

The criteria for hearing conservation, required by OSHAct in 29 CFR 1910.95, establish the permissible levels of harmful noise to which an employee may be subjected. For example, a noise level of 90 dBA is permissible for

eight hours, 95 dBA for four hours. Administering a hearing conservation programs goes beyond the wearing of earplugs or earmuffs.

2.3.2.2 Vibration, either whole-body vibration or segmental vibration, which occurs when a particular body part is affected by vibrations from tools during working process.

2.3.2.3 Pressure above or below atmospheric pressure in the workers' surroundings is associated with health risks in certain occupations, such as undersea diving and aviation. Conditions in the workplace may cause the worker exposed to unusually high or low pressures.

2.3.2.4 Temperature extremes, both high and low temperature can cause health adverse effects. The body continuously produces heat through its metabolic process. Because the body processes are designed to operate only within a very narrow range of temperatures, the body must dissipate this heat as rapidly as it is produced if it is to function efficiently. High temperature affect heat stress heat, exhaustion and heat cramp are found in many occupations. The human body regulates its own internal level of heat, or core temperature.

2.3.2.5 Ionizing radiation, such as electromagnetic ionizing radiation (gamma radiation), or particle radiation. The major concern with exposure to ionizing radiation is severe tissue damage at very high levels and a risk of cancer in the future. When ionization of body tissue occurs, some of the electrons surrounding the atoms are forcibly ejected from their orbits.

2.3.2.6 Nonionizing radiation is a form of electromagnetic radiation with varying effects on the body, depending of longer wavelengths when the energy level is too low to ionize atoms but sufficient to cause physical changes in cells. Ultraviolet radiation is the most common form and causes sunburn and prolonged exposure over time causes cataracts and skin cancer. Low frequency was including power line transmission frequencies, broadcast radio, and short wave radio, can produce general heating of the body.

Babusch W.et al. (2005) they studied outdoor traffic noise level for each subject based on noise maps of the city of Berlin, it was found that men exposure to noise levels more than 70 dB(A) and they revealed that chronic exposure to high levels of traffic noise increases the risk for cardiovascular diseases.[26]

Andrew W. et al.(2003) they studied motorbike taxi and effect of noise, it was found that motorbike taxi has been exposure to excessive noise level and hearing loss as a consequence of that exposure, in addition there has been increasing concern that these workers are exposure to excessive noise through turbulent airflow around the helmet. [27]

Grogan H. and Hopkins P.M.(2002) they study the heat-related illness, such as heat stroke, heat cramp and heat exhaustion as follows; [28]

- Heat stroke cause of exposure high temperature and the medical emergency characterized by a high body temperature, altered mental status and in classical heat stroke, hot, dry flushed skin. Heat stroke occurs when the core body temperature rises against a failing thermoregulatory system.

- Heat cramp refers to muscular cramping occur during exercise in heat, which is related to salt deficiency and is usually benign.

- Heat exhaustion occurs when the body becomes dehydrated and weak, the characteristic of heat exhaustion were nausea, heavy sweating, and vomiting.

2.3.3 Ergonomic hazard

Barbara A. Plog and Patrical J. Quinlan, said that ergonomic hazards in the Fundamentals of Industrial Hygiene that means “the study or measurement of work. It is the application of human biological science in conjunction with the engineering sciences to achieve the optimum mutual adjustment of people to their work.” They provide the principles of biomechanics can be illustrated by considering different parts of human anatomy, such as hand [23]

2.3.3.1 Hand anatomy; the flexing action in the fingers are controlled by tendons attached to muscles in the forearm. The palm of hand, that contains network of nerves and blood vessels. The prolonged repetitive work on the nerves and blood vessels in palm of hand can result in pain. Other parts of the body such as shoulder, arms, and elbow joints can become painful for similar reasons.

2.3.3.2 Lifting; that cause of injuries resulting from manual handling of materials make up a large proportion of all compensable injuries.

2.3.3.3 Workplace design that related with the physical characteristics and capabilities of the workers to design of equipments and layout of workplace. It can increase in efficiency, a decrease in human error, and consequent reduction in accident frequency.

McCormick and Saunders (1993) said that “Ergonomics” applies information about human behavior, abilities and limitations and other characteristics to the design of tools, machines, tasks, jobs and environments for productive, safe, comfortable and effective human use”.[29]

Magnusson Marianne L. et al(2010), they studied in drivers and the cause of back, neck, and shoulder pain and resultant disability, they was found that the highest risk factors for back and neck pain were long-term vibration exposure, heavy lifting and frequent lifting. A combination of long-term vibration exposure and frequent lifting carried the highest risk of low back pain.[30]

Gisele M. and Nelson G.(2008) They determined risk factor and prevalence of work-related musculoskeletal disorders in hairdresser, it was found that occupational risk factors associated with the musculoskeletal disorders in hairdressers are related to biomechanical, organizational and psychosocial work factors. The high prevalence of musculoskeletal disorders showed highlights the importance from suitable furniture, equipment and work tools, and environmental conditions, size of workplace, work organization and psychosocial work factors. [31]

Jens W. et al.(2010) they investigated upper arm posture and movement in female hairdressers, it was found that most of female hairdressers work with the right arm and they might be at risk of musculoskeletal disorder in the neck and shoulders. On the other hand they did not find the pain. Posture variability between days within hairdressers was in the same order of magnitude as that between hairdressers, suggestion that ‘typical’ work days do not exist. [32]

2.3.4 Biological Hazards

Barbara A. Plog and Patrical J. Quinlan, said that biological hazards in the Fundamentals of Industrial Hygiene that approximately 200 biological agents, such as, biological allergens, infectious microorganisms, and toxins, are known to produce

infections or allergenic, toxic or carcinogenic reactions in workers. They was divided into 4 groups: [23]

2.3.4.1 Microorganisms and their toxins such as viruses, bacteria, fungi, and their products.

2.3.4.2 Arthropods such as crustaceans, arachnids and insects, that associated with bites and stings cause of skin inflammation, systemic intoxication and transmission of infectious agents and allergic response.

2.3.4.3 Allergens and toxins from higher plants, rhinitis, producing dermatitis and asthma.

2.3.4.4 Protein allergens such as hair, saliva, urine, and dander.

2.4 Part 4: Job safety analysis Techniques

The study of Umarat S. (2012), she used the job safety analysis (JSA) technique in Huachiew Chalermprakiet Journal, It was revealed this technique can be used to analyze hazards from work. It is easy method and not complicated, this JSA was divided into 5 steps as follows; [33]

1) Select the job to be analyzed, the high accident frequency job should be considered.

2) Break the job down into a sequence of steps. The task step should not over than 10 steps. Observation of job performing and recording of each step must be employed.

3) Identifying the potential hazard covered chemical, physical, biological and ergonomics would be performed. This step is very important. The accidents and illness cause must be recorded in all steps.

4) Determine preventive measure, this step is done in order to eliminate or control the hazard such as reduce the exposure, maintain the hazard and revise working procedure.

5) Considering method for eliminating or reducing hazard by implementing the safety standard operation procedure.

The job safety analysis technique was invented by Chalermchai Ch. He used job safety analysis technique for assessing the risk, and determined for the prevention measure. He recommended 4 steps for JSA as discussed above: select the job, breakdown the job into steps, identify hazards and provide prevention measures. (34)

Australian Government Comcar, recommend the job safety analysis technique in 4 steps consisted of identify the hazards, assess the risk, control the risk and, monitor and review can describe as follows; (35)

1) Identified the hazards. : Identified all hazards associated with job task. They provide many methods to identify hazards as follows;

1.1) Injuries and illness record; review from compensation data and investigation reports

1.2) Walk through surveys and inspection or safety audits in the workplace.

1.3) Consulting with OSH committee to identify the hazards.

2) Assess the risks: Risk assessment the process as follows;

2.1) Gathering the information about identify hazards.

2.2) Consider the number of worker exposure the hazards and duration time to expose the hazards.

2.3) Record the risks rating for each hazard. Should to provide the specialists risk assessment team and expert team in working process.

3) Control the risks; the control measure are minimize the risk and eliminate the hazards in workplace. They called the elimination hazards is ‘hierarchy’ of controls, which mean the elimination the hazards in workplace, isolate the hazards, use engineering methods to control the risk and use the administration to control the risk.

4) Monitor and review; it must to implemented the hazards due to

4.1) Use new technology and equipments.

4.2) The introduction of new working process.

4.3) Introduction for new workers or staffs.

The job safety analysis used in this study employed the principle step from those previous studies. It is proper for assess the risk for informal worker because the

job safety analysis is simple technique to make better and clear understanding of risk among workers. The informal worker can divide the job task and determine hazards in their work. The leaders of informal workers played important role to assess the risk provide and motivate health promotion for prevention diseases or accident from work.

2.5 Part 5: Literature review

The occupational health risks of informal workers were divided into 4 sections; working conditions, safe work behaviors, health problem and perception of occupational health risk (accidents) as follows;

2.5.1 Working conditions

Siriprapa P. (2011): this research determined the working problem and protection measure provided by Thai government to informal workers in Chiangmai province. The major problems of working came from work conditions followed by employment condition problem and social welfares problem were found. The main working problems of informal workers came from uncertain work schedule followed by working prolong more than 8 hour/day, no holiday and dissatisfied income. (5)

Trongyos K. (2011): studied health condition and health risk behaviors of informal workers and the factors affected of health condition and health risk behaviors. This study collected the data by introducing 390 questionnaires to informal workers. They found high frequented risk working conditions from poor heavy lifting and dust exposure, while the health problem was respiratory problem and skin irritation. This study suggested the model of participatory approach on occupational health promotion of informal worker, which provide health team, evaluation the risk in working condition, planning, monitoring and data feedback. (7)

Chavada V K. (2010) determined the health problem and prevention health diseases of tailoring in urban Slum, India. The data was collected by a semi-structured interview. The study was found that diseases in male was higher than in female. The cause of health problem came from poor working condition and long working hours. The most common accidents were finger injuries caused by needle. Most of accident

found in tailors who dad experience less than 20 years. The musculoskeletal pain came from prolong sitting. (36)

Usaman W. (2011): conducted and assessment for health risk in workplace in Muslim community. The data was collected by using health risk questionnaires. The result of this study found the high health risk of informal workers, which came from poor working condition 60 % and followed by 50 % of safety behavior in working. The highest frequency risk in working conditions came from heavy handling followed by poor working posture cause paint, high temperature in workplace or outdoor and dust exposure. (37)

Anirute M. et.al, (2010): studied a participatory approach to health promotion for Thai informal workers. The population of this study consisted of four regions of Thailand, including - ceramic workers in the North region, a plastic weavers in the central region, blanket workers in the Northeast region and pandanus weavers in the South region. The data was collected by questionnaire, the industrial hygiene instruments was employed to measure working environment and group discussion was conducted among targets groups. This study was found that the OHS knowledge, attitude, and behaviors scores of all informal workers higher than pre- training and the work practice improvement score higher than pre-test average score. The highest frequency risk in working conditions for ceramic workers was a high, temperature; the plastic weavers, blanket workers and pandanus weavers were a poor lighting situation. (38)

Shivakumara BS and Sridhar V. (2010) studies showed the health problem and working condition problem in motorbike taxi in India. The major of health problem came from hands arm vibration from handheld equipments concerned white fingers disease and whole body vibrations with associated with high blood pressure, kidney disorders and impotence. The cause of vibration came from the roads condition. (39)

2.5.2 Safe work behaviors

Anne B. (2012) studied the prevention of occupational hand aczema among Danish hairdressing. The results showed that most of hairdressers didn't used gloves in some job steps, because they were not comfortable to used gloves such as wash hair by shampoo, these causes of hand aczema or dermatitis. (13)

Albin M. et al. (2002) investigate the risk of asthma in female hairdressers certified from vocational schools. The data was collected by questionnaire that was found the hairdressers exposure to persulphates in hair bleach during mixing of the powder and most of them and lack of respiratory protection. (14)

Richard F.et al. (2013) determined the perception of motorbike taxi for wearing helmet in Gana, The data was collected by questionnaire and roadside observation for helmet usage. This clearly shows that most motorbike taxi does not prefer wearing helmet while working and they was found passengers did not wearing helmet also. (40)

2.5.3 Accidents

Anirute M.(2005) assessments for the occupational health problem of informal workers in Phuket province. The data was collected by 385 introducing questionnaires. The result of this study found most of informal workers don't had any disease and in during three months and don't had illness .The accident in working condition mostly showed slightly injured and work – related accident without loss time. Most of informal workers receive health service at government hospital and they pay the medical treatment by themselves.(8)

Judith S. et al. (2011) determined the prevalence and risk factors of occupational skin disorders and scissors-induced injuries among hairdressers in Taiwan. The data was collected by questionnaires interview, patch testing, skin and physical examination. The results of this study found most of accident was finger injured by scissor and male stylists had accident was higher than in female hairdressers. The majority health problem in hairdressers was hand dermatitis came from using shampoo. (12)

Sara A. et al. (2010): determined the cost of occupational health and safety to reduce the health problems, accident injured and illness in rubber tappers by

implementation health promotion program in rubber tappers. The data was collected by questionnaire for pre test and post test in 49 rubber tappers and the researcher provided the safety training programs for informal workers. This study showed no relationship between the medical expense and the prevention of accident, illness and work-related injured. The total of accident, illness and work- related injured was lower than post training. (41)

2.5.4 Health problems

Vijit R. et al.(2009) studied the quality of life in motorbike taxi and sellers in the market in Bangkok. The data was collected by introducing 1000 questionnaires. The result of this study found motorbike taxi had a health risk was higher than in sellers. Most of motorbike taxi had a working time more than 8 hours/day, follow by no annual physical health check-up. The majority disease was asthma followed by a cataract in the eye and hypotension. They were necessary a welfare to residential, medical fee. (11)

Hsieh-Ching C. et al. (2010) assessed health problem in hairdressers. This result showed the average time to finish haircut in woman is significantly longer than men's haircut. The non-dominant hands of hairdressers have significantly higher overall wrist velocity than those of barbers. Female hairdressers had prolonged exposure the higher rate of hand/wrist pain than male hairdressers.(15)

2.6 The result of literature review

2.6.1 Working condition problem

Most of informal workers expose the potential hazard in workplace. The informal workers showed risks in working conditions came from poor working posture, heavy lifting, poor lighting, dust exposure, expose chemical hazard, extreme temperature. These cause illness and injured for informal workers.

2.6.2 Employ and welfare problem

The informal workers had the knowledge and attitude about the social welfare, payable rate for social security and necessary enter to social security. Most of them need medical treatment expense and the resource of funds.

2.6.3 Health problem

Most of informal workers had occupational health problem came from working conditions such as most of motorbikes taxi in Jatujak in Bangkok no annual physical health check up and mostly disease was allergy, asthma, cataract, and hypotension. Tailors Urban Slum of Mumbai, India also was musculoskeletal pain cause by prolong sitting in same posture. Pain in taxi drivers came from poor working posture and prolong sitting in cab. The highest frequency of health problem in hairdressers was wrist hand pain caused by haircut and hand dermatitis caused by exposure shampoo.

CHAPTER III
METHOD

This research aimed to study occupational health risk and health problem of informal workers in Bangkok. This was a survey research study. Data was collected by introducing questionnaire to the subjects and the discussion was conducted for job safety analysis whereas the secondary data from the National health security manual were studied. The populations were informal workers in Bangkok – which consisted of four careers 1.Taxi drivers 2. Motorbike taxi 3. Tailors 4. Hairdressers.

3.1 Research design

This study is a descriptive research and survey study

3.2 Study Population and sample

3.2.1 Study population

The populations of this study were informal workers in Bangkok – Which consisted of four categories (as prescribed by the office of the National Economic and Social department) 1) Production 2) Commercial and service 3) Logistic service 4) Working at home. A purposive sampling technique was used in this study to select the 3 categories for four informal workers groups.

3.2.2 Sample size

Sample of this study were the informal workers in four groups. The informal workers were working with of the research center for informal workers, department occupational health and safety, Faculty Public health, Mahidol University,

December 2012. A simpling technique was used in this step to select the sample sizes that include member 774 persons. The sample size of this study was calculated by using Yamane's formula (Taro Yamane, 1973 : 125)

$$n = \frac{N}{1 + Ne^2}$$

n = Sample size

N = Total Population

e = Score of error (In this study determined at .05)

So that , computation $= \frac{774}{1 + 774\ (.05)^2} = 260$ persons

The sample sizes of informal workers were 260 personals. In this study, the sample size were increased to 300 personals because any possible uncompleted questionnaires. As follows;

Table 3.1 sample size of study

Informal workers groups	**Total of population**	**Sample size**
1. Taxi drivers	100	40
2. Motorbike taxi	170	66
3. Hairdressers	204	78
4. Tailors	300	116
Total	774	300

3.2.3 Including sample criteria

2.2.3.1 They living in Bangkok or working in Bangkok

2.2.3.2 They can communicate to the researcher using Thai

2.2.3.3 The age more than 18 years old and their working experience are more than 1 year.

3.3 Research Instrument

This study used two tools to collected data using questionnaires and job safety analysis method. The questionnaire was developed by the Bureau of occupational and environmental disease, Department of disease control and expert professionals. It was composed four parts as follows;

Part 1 This part consisted of 15 questions asking the characteristic of population and health behaviors such as age, gender, address, occupational, education, sleeping time, alcohol assumption, smoking and exercise.

Part 2 This part consisted of 13 questions asking for perception occupational health risk for 1 question and for the severity and experience of accident for 10 questions. Two questions were opened-end question asking for the risk in workplace and prevention measure.

The rating scale of severity and experience in accident:

Scale	Score
Slightly (no stop work)	1
Moderate (Stop work 1-3 day)	2
High (Stop wok more than 3 days)	3
Highest violence (Disability)	4

Part 3 This part consisted of 5 questions asking for the safe work behaviors in working example hand washing, body clean after finish work, PPE used, Type of PPE and check the machine, tools or vehicle. The four questions asking for hand washing, body cleaning, PPE using and machine, tools and vehicle checking would be analyzed by rating scale for used to rating scale (hand washing, body cleaning, PPE using and machine, tools and vehicle checking) (Best, 1977:14)

Scale	positive score	negative score
none	1	3
sometime	2	2
always	3	1

$$\frac{\text{Highest score} - \text{Lowest score}}{\text{Number of level}}$$

$$= \frac{12-4}{3}$$

$$= 2.7$$

Criteria to determine the level of safe work behaviors

The average scores	level of behaviors
4.00 - 6.70	Low safe behavior
6.71- 9.40	moderate safe behavior
9.41- 12.00	high safe behavior

Part 4 This part consisted of 24 questions asking for disease, the treatment of diseases, working condition problem and the symptom of health problems.

- Chronic diseases for 6 questions
- The type of treatment 1 question
- The score for working condition was only 1 and 0, Yes = 1, No= 0 (9 questions), 1 mean score have working condition problem.
- The severity symptom of health problem or illness caused by working condition (8 questions)

Scale	Score
No symptom	1
Slight (no treatment)	2
Moderate (treat by medicine)	3
High (medical treatment)	4

$$\frac{\text{Highest score} - \text{Lowest score}}{\text{Number of level}}$$

$$= \frac{4-1}{3}$$

$$= 1$$

The average scores	level of health problem
1.00- 2.00	Low health problem
2.01- 3.00	Moderate health problem
3.01- 4.00	High health problem

The total of scores from part 3- 4 for classification of risk as follows; (Best, 1977:14)

$$\frac{\text{Highest score} - \text{Lowest score}}{\text{Number of level}}$$

$$= \frac{50-12}{4}$$

$$= 9.5$$

Classification	scores
Low risk	12.00-21.50
Moderate risk	21.51- 31.00
High risk.	31.01-40.50
Highest risk	40.51-50.00

3.4 Job safety analysis

The informal workers were asked to share idea to analyze the jobs, to identify the risk and to suggest for the prevention measure. The leader and volunteers of each group 15-20 informal workers participated for the discussion. The process of Job safety analysis as follows;

1) To discussion and explain for the aim of this study and method of job safety analysis for classify the job task
2) To identify hazards of job task.
3) To provide the prevention and control measures.

3.5 Validity and reliability

3.5.1 Questionnaire validity test

The questionnaires were approved by the expert professional for suggestion and improvement. Some questionnaires were deleted and some were added while some questionnaires were adjusted for better understanding.

3.5.2 Questionnaires Reliability Test

The questionnaires were tested in motorbike taxi working around Mahidol University to determine reliability test by Cronbach's Coefficient of Alpha of SPSS program. The Cronbach's Coefficient of Alpha, the safe work behaviors scale was 0.491 and the health problem scale was 0.8844

3.6 Data collection

The steps in collecting data were as follows;

1) After the approval the research by the Ethical Review Committee for Human Research (COA.No.MUPH 2013-007), Faculty of Public Health, Mahidol University. The researcher sent the letters asking for permission to collected the data from Graduate School, Mahidol University to the leader of informal workers in Bangkok and the Director of occupational center school for salon groups.

2) The research met the leader of informal worker and director of occupational center school to explain the aim of this study, set the date, time and details of data collection by questionnaire and discussion for job safety analysis. Then the questionnaires were sent to the workers groups and in some cases of workers, the researcher asked direct to the informal workers, who could not read questionnaire. The duration for answering the questionnaires not longer than 20 minutes.

3) Job safety analysis was selected 15 -20 leader and volunteers of each groups to share idea for identify hazards and suggested for prevention measures. Before discussion, the researcher explained the aim of this study and technique for analyze the job. It took approximately time not longer than 40 minutes to complete all questionnaires.

4) The returned 300 questionnaires were checked for completion. The completed questionnaires were further analyzed.

3.7 Data analysis

The returned questionnaires were checked and registered the code in computer for the data analysis by using SPSS program version 11.5. The statistical for analysis was as follows;

Descriptive statistic were used to describe the characteristics , health status, perception occupational health risk, severity of accidents, health behaviors in working, disease, working condition problem and severity of health problem in among informal workers by tables of frequency, percentage, mean, standard deviation , the

range of maximum and minimum value. The Multiple comparisons were used for the evaluation of safe work behavior, health problem and occupational health risk.

CHAPTER IV
RESULTS

The research aimed to study occupational health and health problem of informal workers among in taxi drivers, motorbike taxi, hairdressers and tailors in Bangkok. Data were collected by introducing 300 questionnaires to subject. Statistical analysis used were frequency distribution, mean, percentage, standard deviation, the range of maximum and minimum value and multiple comparison.

After analyzing the data, the study results were presented as follows:

Part 1: The characteristics of informal workers and health behaviors such as age, gender, address, occupational, education, sleeping time, alcohol consumption, smoking and exercise.

Part 2: The perception occupational health risk experience and severity of accident.

Part 3: The safe working behaviors

Part 4: The health problem of working such as disease, treatment diseases or illness, working condition and severity of health problems.

Part 5: Occupational health risk in work place and prevention measure by job safety analysis

Part 6: Health care service data

4.1 Part 1: The characteristics of informal workers and health behaviors such as age, gender, address, occupational, education, sleeping time, alcohol consumption, smoking and exercise.

There were 130 male informal workers (43.3 %) and 170 female informal workers (56.7 %). Their age ranged between 36-45 years (30.3 %) followed by 26-35 years (25.3 %), 46- 65 years (22.3%), more than 55 years (15.0%) and 18-25 years

(5.7%) The mean age of subjects was 42 years, standard deviation of 11.3. The maximum age of informal workers was 74 years and minimum age was 18 years. Most of informal workers were employers (78.0%).The mean working experience was 12.54 years and standard deviation was 10.08 the minimum of working experience was 1 years and maximum working experience was 45 years. It was presented in Table 4.1

Table 4.1 Number and percentage of Population characteristics of informal workers (n=300)

	Number	Percentage
Gender		
Male	130	43.3
Female	170	56.7
Age (year)		
18-25	17	5.7
26-35	76	25.3
36-45	91	30.3
46-55	67	22.3
>55	45	15.0
$\overline{X}$ =42 S.D = 11.3 Max =74 Min =18		
Work experience		
1-5	85	28.3
6-10	48	16.0
11-15	49	16.3
16-20	28	9.3
21-25	21	7.0
> 25	69	23
$\overline{X}$ = 12.54 S.D deviation =10.8 Min= 1 Max = 45		
Employment status		
Employer	234	78.0
Employee	66	22.0

4.1.1 The characteristic of informal workers in among taxi drivers, motorbike taxi, hairdressers and tailors

All of taxi drivers were male (100 %) mostly age between 46-55 years (50.0%) followed by more than 55 years (37.5%). The average age were 52.9 years. The maximum age of subject was 74 years and minimum age was 32 years and standard deviation was 8.75. The mean working experience was 20.6 years and standard deviation was 10.49. The minimum of working experience was 3 years and maximum working experience was 45 years. Most of them had been educated in primary school (70 %) followed by secondary school (20.0 %) and bachelor degree (10.0%)

Most of motorbike taxi are male 60 persons (90.9%) and female 6 persons (9.1 %) mostly age between 36-45 years (34.8 %) followed by 46-55 years (27.3%), the average age was 38 years. The maximum age of subject was 58 years and minimum age was 21 years and standard deviation is 5.4. The mean working experience was 13.5 years and standard deviation was 8.1. The minimum of working experience was 2 years and maximum working experience was 32 years. Most of them had been educated in secondary school (54.5%) followed by primary school (43.9%) and vocational (1.5%).

Most of hairdressers were female 58 persons (74.4 %) and male 20 persons (25.6%) mostly age between 26-35 years (43.6 %) followed by 36-45 years (34.6%) , the average age was 35.0.The maximum age of subject was 55 years and minimum age was 18 years and standard deviation was 8.1. The mean working experience was 6.7 years and standard deviation was 5.5.The minimum of working experience was 1 years and maximum working experience was 25 years. Most of them had been educated in secondary school (42.3%) followed by vocational (28.2%), primary school (19.2%), bachelor degree (9.0%) and no education (1.3%)

Most of tailors were female 106 persons (91.4%) and male 10 persons (8.6%) mostly age between 36-45 years (32.8%) followed by more than 55 years (25.0%), 26-35 years (19.8%), 46-55 years (18.1%) and 18-25 years (3.4%).The average age was 44.45 years. The maximum age of subject was 71 years and minimum age was 21 years and standard deviation is 11.7. The mean working experience was 13.2 years and standard deviation was 10.8. The minimum of working experience was

1 years and maximum working experience was 42 years. Most of them had been educated in primary school (43.1 %) followed by secondary school (34.5%), bachelor degree (13.8%), vocational (7.8%) and no education (0.9%). It was presented in table 4.2

Table 4.2 Number and percentage of Population characteristics of informal workers

	Taxi drivers n=40	**Motorbike taxi n=66**	**Hairdressers n=78**	**Tailors n=116**
Gender				
Male	40(100 %)	60(90.9%)	20(25.6%)	10(8.6%)
Female	0	6(9.1%)	58(74.4%)	106(91.4%)
Age				
18-25	0	5(7.6%)	8(10.3%)	4(3.4%)
26-35	2(5.0%)	17(25.8%)	34(43.6%)	23(19.8%)
36-45	3(7.5%)	23(34.8%)	34(35.1%)	38(32.8%)
46-55	20 (50.0%)	18(27.3%)	8(10.3%)	21(18.1%)
>55	15(37.5%)	1(1.5%)	0	29(25.0%)
Work experience				
1-5	2(5.0%)	13(19.7%)	40(51.3%)	30(25.9%)
6-10	6(15.0%)	12(18.2%)	12(15.4%)	18(15.5%)
11-15	5(12.5%)	15(22.7%)	12(15.4%)	17(14.7%)
16-20	11(27.5%)	7(10.6%)	1 (1.3%)	9(7.8%)
21-25	3(7.5%)	8(12.1%)	2 (2.6%)	8(16.9%)
>25	13(32.5%)	11(16.7%)	11(14.1%)	34(29.3%)
education				
None	0	0	1(1.3%)	1(0.9%)
Primary	30(75.0%)	29(43.9%)	5(6.4%)	50(43.1%)
Secondary	6(15.0%)	36(54.5%)	33(42.3%)	40(34.5%)
Vocational	0	1(1.5%)	22(28.2%)	9(7.8%)
Bachelor degree	4(10.0%)	0	7(9.0%)	16(13.8%)

4.1.2 Health behavior

Most of taxi drivers had sleeping time less than 8 hours (80.0 %). Related to the alcohol consumption of taxi drivers most of them were alcohol drinker (52.5%) and never used alcohol (45.0 %). Most of taxi drivers never smoked (55.0%) smoker (35.0%) and were ex-smoker for (10.0 %). They never performed exercise (52.50 %) followed by exercised less than 3 times per week (27.5 %) and did exercise more than 3 times per week (20.0%). The meals of taxi drivers were not on- time (72.5 %) and on-time for 27.5 %

Most of motorbike taxi had sleeping time less than 8 hours (74.4 %). followed by ≥ 8 hours (25.6 %). Most of them were alcohol drinkers (68.2%) and never consumed alcohol (22.7 %). Most of motorbike taxi were smoker (47.0%) followed by never smoked (45.5 %) and were ex-smoking (7.5 %). They never exercised (74.2 %) followed by exercised less than 3 times per week (21.3 %) and did it more than 3 times per week (4.5%). The meals of motorbike taxi were not on-time (86.4 %) and on-time for 13.6 %.

Most of hairdressers had sleeping time less than 8 hours (74.4%) followed by ≥ 8 hours (25.6%). Most of them were not alcohol drinker (51.3%) followed by alcohol drinker (37.2 %). Most of hairdressers were non smoker (83.3 %) followed by smoker (15.4%) and were ex-smoking for 1.3%. They never exercised (43.60%) followed by did exercise less than 3 times per week (42.30 %) and for more than 3 times per week (14.10%). The meal of hairdressers are no on- time (80.8%) and on-time (19.2%)

Most of tailors had sleeping time more than 8 hours (61.1%) followed by less than 8 hours (37.9 %). Most of them were never consumed alcohol (81.9%) and were alcohol drinkers (12.9%). Most of tailors were non smokers (94.8%) followed by ex-smoke for 3.5% and they were smokers for 1.7%. They never exercised (58.6%) followed by did exercise less than 3 times per week (28.5 %) and for more

than 3 times per week (12.9%). The meals of hairdressers were not on- time (67.2%) and on-time for 32.8%. That was presented in table 4.3

Table 4.3 Number and percentage in health behaviors of informal workers

	Taxi drivers n=40	**Motorbike taxi n=66**	**Hairdressers n=78**	**Tailors n=116**
Sleep time				
<8	32(80.0%)	44 (66.7%)	58(74.4%)	44(37.9%)
≥8	8(20.0%)	22(33.3%)	20(25.6%)	72(62.1%)
Alcohol				
None	18(45.0%)	15(22.7%)	40(51.3%)	95(81.9%)
Ex-drinker	1(2.5%)	6(9.1%)	9(11.5%)	6(5.2%)
Drinker	21(52.5%)	45(68.2%)	29(37.2%)	15(12.9%)
Smoke				
None	22(55.0%)	30(45.5%)	65(83.3%)	110 (94.8%)
Ex-smoker	4(10.0%)	6(9.1%)	1(1.3%)	4(3.5%)
Smoker	14(35.0%)	31(47.0%)	12(15.4%)	2(1.7%)
Exercise				
None	21(35%)	49(74.2%)	34(43.6%)	68(58.6%)
Exercise <3/week	11(30%)	14(21.3%)	33(42.3%)	33(28.5%)
Exercise ≥3/week	8(32.5%)	3(4.5%)	11(14.1%)	15(12.9%)
Meal				
On time	29(72.5%)	57(86.4%)	63(80.8%)	78(67.2%)
Not on time	11(27.5%)	9(13.6%)	15(19.2%)	38(32.8%)

Types of alcohol

There were four types of alcohol, which were asked in questionnaires: beer, whisky, rice whisky and wine. Most of taxi drivers drunk beer (61.5%) followed by whisky (30.8%) and rice whisky (7.7%). The frequency of beer drinking was for everyday (56.3%) followed by 1-2 days/week (18.8%), 3-4 day/week (12.5%) and 1time/month (12.5%). The amount was 1-3 glasses (43.8%) followed by 4-6 glasses (31.2%), more than 9 glasses (18.8%) and 7-9 glasses (6.2%).

Most of motorbike taxi used beer as same as for whisky (42%), rice whisky (11.5%) and wine (3.3%). The frequency of beer drinking was for 1-2 day/week (30.8%) followed by used everyday as same as for everyday and 5-6 day/week (23.1%) and 1 time/month for 3.8 %. The amount was 1-3 glasses (38.5%) as same as more than 9 glasses (38.5%), 4-6 glasses and 7-9 glasses for 11.5 %.

Most of hairdressers consumed beer (37.9%) followed by whisky (30.3%), wine (22.7%) and rice whisky for 11.5%. The frequency of beer drinking was 1 time/month (52. 0%) followed by 1-2 day/week (40.0%), every day (4.0%) and 3-4 day/week for 4.0%. The amount of alcohol was 4-6 glasses (32.0%) followed by 7-9 glass (28.0%), 1-3 glasses (20.0%) and more than 9 glasses for 20 %.

Most of tailors were beer drinking (48.2%) followed by whisky (33.3%) wine (14.8%) and rice whisky (3.7%). The frequency of beer drinking was for everyday (53.8%) followed by 1-2 day/week and 3-4 day/week (23.1%). The amount o of alcohol was 1-3 glass (53.8%) followed by 4-6 glass as same as 7-9 glass (23.1%). That was presented in table 4.4-4.5

Table 4.4 Number and percentage type of alcohol and frequency of alcohol drinker of informal workers.

	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
Rice whisky	2(7.7%)	7 (11.5%)	6 (9.1%)	1 (3.7%)
everyday	0	2(28.6%)	0	1(100%)
5-6day/week	0	1(14.3%)	0	0
3-4day/week	0	1(14.3%)	1(16.7%)	0
1-2day/week	1(50.0%)	2(28.6%)	2(33.3%)	0
1time/month	1(50.0%)	1(14.3%)	3(50.0%)	0

Table 4.4 Number and percentage type of alcohol and frequency of alcohol drinker of informal workers. (cont.)

	Taxi drivers	**Motorbike taxi**	**Hairdresser**	**Tailors**
Whisky	8 (30.8%)	26 (42.6%)	20(30.3%)	9 (33.3%)
everyday	6(75.0%)	3(11.5%)	0	0
5-6day/week	0	4(15.4%)	1(5.0%)	0
3-4day/week	1(12.5%)	9(34.6%)	1(5.0%)	1(11.1%)
1-2day/week	0	7(26.9%)	3(15.0%)	3(33.3%)
1time/month	1(12.5%)	3(11.5%)	15(75.0%)	5(55.6%)
Beer	16(61.5%)	26 (42.6%)	25(37.9%)	13 (48.2%)
everyday	9(56.3%)	6(23.1%)	1(4.0%)	7(53.8%)
5-6day/week	0	6(23.1%)	0	0
3-4day/week	2(12.5%)	5(19.2%)	1(4.0%)	3(23.1%)
1-2day/week	3(18.8%)	8(30.8%)	10(40.0%)	3(23.1%)
1time/month	2(12.5%)	1(3.8%)	13(52.0%)	0
Wine	0	2 (3.3%)	15(22.7%)	4 (14.8%)
everyday	0	1(50.0%)	0	0
5-6day/week	0	1(50.0%)	0	0
3-4day/week	0	0	2(13.3%)	0
1-2day/week	0	0	1(6.7%)	1(25.0%)
1time/month	0	0	12(80.0%)	3(75.0%)

Table 4.5 Number and percentage of glasses amount alcohol drinker of informal workers.

	Taxi drivers	**Motorbike taxi**	**Hairdresser**	**Tailors**
Rice whisky	2(5.0%)	7 (11.5%)	6 (9.1%)	1 (3.7%)
1-3 glass	1(50.0%)	2(28.6%)	2(33.3%)	1(100%)
4-6 glass	1(50.0%)	3(42.8%)	2(33.3%)	0
7-9 glass	0	2(28.6%)	2(33.3%)	0
>9 glass		0		0

Table 4.5 Number and percentage of glasses amount alcohol drinker of informal workers. (cont.)

	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
Whisky	8 (20.0%)	26 (42.6%)	20(30.3%)	9 (33.3%)
1-3 glass	4(50.0%)	2(28.6%)	8(40.0%)	9(100%)
4-6 glass	1(12.5%)	1(14.3%)	10(50.0%)	0
7-9 glass	3(37.5%)	1(14.3%)	1(5.0%)	0
>9 glass	0	2(28.6%)	1(5.0%)	0
Beer	16(40.0%)	26 (42.6%)	25(37.9%)	13 (48.2%)
1-3 glass	7(43.8%)	10(38.5%)	5(20.0%)	7(53.8%)
4-6 glass	5(31.2%)	3(11.5%)	8(32.0%)	3(23.1%)
7-9 glass	1(6.2%)	3(11.5%)	7(28.0%)	3(23.1%)
>9 glass	3(18.8%)	10(38.5%)	5(20.0%)	0
Wine	0	2 (3.3%)	15(22.7%)	4 (14.8%)
1-3 glass	0	1(50.0%)	3(20.0%)	2(50.0%)
4-6 glass	0	1(50.0%)	8(53.3%)	2(50.0%)
7-9 glass	0	0	2(13.3%)	0
>9 glass	0	0	2(13.3%)	0

Smoking

Most of taxi drivers were non smoker (55.0%) followed by smoker (35.0%) and ex-smoker for 10.0%. A total of cigarette was less than 10 cigarettes per day (57.1%) followed by 10-20 cigarettes per day (42.9%).

Most of motorbike taxi were smoker (47.0%) followed by non smoke (45.5%) and ex-smoker for 9.1%. A total of cigarette was 10-20 cigarettes per day (67.7%) followed by less than 10 cigarettes per day (32.3%).

Most of hairdressers were non-smoker (83.3%) followed by smoker (15.4 %) and ex-smoker for 1.3%. A total of cigarette was less than 10 cigarettes per day (58.3%) followed by 10-20 cigarettes per day (41.7%).

Most of tailors were non-smoker (94.8%) followed by ex-smoker (3.5%) and smoker for 1.7%. A total of cigarette was 10-20 cigarettes per day (50.0%) as same as less than 10 cigarettes per day (50.0%). That was presented in table 4.6

Table 4.6 Number and percentage totals of cigarettes for smoke per day in informal workers

Amount of cigarette per day	**Taxi drivers**	**Motorbike taxi**	**Hairdresser**	**Tailors**
1-10	8(57.1%)	10(32.3%)	7(58.3%)	1(50.0%)
11-20	6(42.9%)	21(67.7%)	5(41.7%)	1(50.0%)

Exercise

The time for exercise in taxi driver mostly more than 30 minutes (68.4%) and less than 30 minutes (31.6%)

The time for exercise in motorbike mostly more than 30 minutes (64.7%) and less than 30 minutes (35.3%)

The time for exercise in hairdressers mostly more than 30 minutes (54.5%) and less than 30 minutes (45.5%)

The time for exercise in tailors mostly less than 30 minutes (68.7%) and more than 30 minutes (31.3%). That was presented in table 4.7

Table 4.7 Number and percentage of the duration of exercise in among informal workers.

	Taxi drivers	**Motorbike taxi**	**Hairdresser**	**Tailors**
< 30 minute	6(31.6%)	6(35.3%)	20(45.5%)	33(68.7%)
≥ 30 minute	13(68.4%)	11(64.7%)	24(54.5%)	15(31.3%)

4.2 Part 2: The perception occupational health risk, experience and severity of accident.

4.2.1 The perception occupational health risk

The perception of occupational health risk of taxi drivers, motorbike taxi and tailors in workplace were 70.0%, 92.4% and 50.9 %, respectively. The perception of occupational health risk among hairdressers was for no health risk in workplace for 43.6 % as same as be not sure for the health risk (43.6%) and they perceived a health risk in workplace for 12.8%. It was all presented in table 4.8

Table 4.8 Number and percentage the perception occupational health risk of informal workers

Health risk Perception	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
No	12(30.0%)	2(3.0%)	34(43.6%)	59(50.9%)
Not sure	0	3(4.5%)	34 (43.6%)	20(17.2%)
Yes	28(70%)	61(92.4%)	10(12.8%)	37(31.9%)

4.2.2 Accidents

50.0% of taxi drivers had experience in accident as same as never had accident (50.0 %). Most of motorbike taxi had accident during work (69.7 %) and never had for 30.3%. Most of hairdressers never had accident for 67.9 % and had accidents for 32.1%. Most of tailors had accident in their working place 70.7 % followed by never had accident (29.3%). That was presented in table 4.9

Table 4.9 The experience of accident in workplace of informal workers

Accident in workplace	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
No	20(50%)	20(30.3%)	53(67.9%)	34(29.3%)
Yes	20(50%)	46(69.7%)	25 (32.1 %)	82(70.7%)

Type of accident

Most of taxi drivers and motorbike taxi showed a highest frequent of work-related accident of car accident for 100% and 93.9 %, respectively.

The highest frequent of accident in hairdressers was cutting injuries for 28.0% followed by slippery in workplace 24.0%, struck against 16.0%, contact with electric current 12.0% and exposed to heat 10.0%.

The majority of accident in tailors was fingers injury by scissors and needle 55.6% followed by slippery in workplace (13.5%) and electric shock (11.3%). That was presented in table 4.10

Table 4.10 Number and percentage type of accident in workplace of informal workers

Type of accident	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
Sharp	0	0	14(28.0%)	74(55.6%)
Slippery	0	1(2.0%)	12(24.0%)	18(13.5%)
Struck against	0	1(2.0%)	8(16.0%)	13(9.8%)
Crash by car	20(100.0%)	46(93.9%)	0	0
Machine	0	0	3(6.0%)	5(3.8%)
Electrical shock	0	0	6(12.0%)	15(11.3%)
Chemical	0	0	2(4.0%)	0
Heat	0	1(2.0%)	5(10.0%)	8(6.0%)

4.2.3 The severity of accidents among taxi drivers

The severity of accident in taxi driver mostly showed in slight level (85.0%) followed by high level (15.0%). That was presented in table 4.11

Table 4.11 Number and percentage of the level of severity of accident among taxi drivers by car accident

Accident	slight	moderate	high	Highest
Crash by car	17(85.0%)	0	3(15.0%)	0

4.2.4 The severity of accidents among motorbike taxi

The severity of car accidents in motorbike taxi mostly showed in slight level (71.7%) followed by high level (13.0%), moderate level (8.7%) and highest level (disability) (6.5%). That was presented in table 4.12

Table 4.12 Number and percentage the level of severity in among accident motorbike taxi

Type of Accident	slight	moderate	high	Highest
Crash by car	33(71.7 %)	4(8.7%)	6(13.0%)	3(6.5%)
Slippery	1(100.0%)	0	0	0
Struck against	0	1(1.5%)	0	0
Expose to heat	1(1.5%)	0	0	0

4.2.5 The severity of accidents among hairdressers

The severity of cutting injury showed in slight level (100.0%), the severity of slippery mostly showed in slight level (91.7%) followed by moderate level (8.3%), the severity of exposed to heat showed in slight level (100.0%) and the severity of electric shock showed in slight level (100.0%). That was presented in table 4.13

Table 4.13 Number and percentage of the level of severity of accident among hairdressers

Type of Accident	slight	moderate	high	Highest
Sharp/scissors	14(100.0%)	0	0	0
Slippery	11(91.7%)	1(8.3%)	0	0
Expose heat	5(100.0%)	0	0	0
Electrical shock	5(83.3%)	1(16.7%)	0	0

4.2.6 The severity of accidents among tailors

The severity of finger injury by scissors and needle showed in slight level (100.0%) , the severity of slippery mostly showed in slight level (83.3%) followed by moderate level (11.1%) and the severity of electric shock mostly showed in slight level (86.7%) followed by moderate level (13.3%). That was presented in table 4.14

Table 4.14 Number and percentage of the severity of accident among tailors.

Type of Accident	slight	moderate	high	Highest
Sharp/scissors	74(100.0%)	0	0	0
Slippery	15(83.3%)	2(11.1%)	1(5.6%)	0
electric shock	13(86.7%)	2(13.3%)	0	0

4.3 Part 3: The safe work behaviors in working

Most of taxi drivers sometime washed hand before eating food (65.0%) followed by always washed hand before eating food (32.5%) and did not wash hand (2.5%). They cleaned body immediately after finishes work mostly showed in did not for “some time” (62.5%) followed by always clean body (37.58%). They always used PPE (87.5%) followed by sometime used PPE (1.5%) and they always checked their car before work (77.5%) followed by sometimes checked their car (20.0%).

The high frequented wash hand in motorbike taxi was at sometime as same as always wash hand before eating food (47.0%). They always clean body immediately after finishing work (54.5%) followed by sometime clean body after finish work (43.9%). They always used PPE during rides a motorcycle (81.8%) followed by sometime used PPE (18.2%) and they sometime check motorcycle before work (51.1%) followed by always did the inspection their car before working (30.3%).

Most of hairdressers sometime washed hands before eating food (59.0%) followed by always washed hand before eating food (41.0%). Most of them always cleaned body immediately after finishing work (64.1%) followed by sometime cleaned body immediately after finishing work (32.1%). They sometime used PPE (44.9%) followed by always use PPE as same as didn't used PPE (26.9%). Most of them some-time checked their equipments before working (47.4%) followed by always did the inspection (33.3%).

Most of tailors always washed hand before eating food (69.8%) followed by some-time washed hand before eating food (30.2%). Most of tailors always cleaned body immediately after finishing work (55.2%) followed by some- time cleaned body immediately after finishing work (36.2%). Most of them sometime used PPE (48.3%) followed by always used PPE (32.8%) and never used any PPE (21.6%).They some-time checked their machines before working (45.7%) followed by always checked their machines before working (32.8%) and never did the inspection (21.6%). That was presented in table 4.15

Table 4.15 Number and percentage of the safe work behaviors

	Taxi drivers	**Motorbike taxi**	**Hairdresser**	**Tailors**
Washing hand				
No	1(2.5%)	4(6.1%)	0	0
Some time	26(65.0%)	31(47.0%)	46(59.0%)	35(30.2%)
Always	13(32.5%)	31(47.0%)	32(41.0%)	81(69.8%)

Table 4.15 Number and percentage of the safe work behaviors (cont.)

	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
Cleaning body				
No	0	1(1.5%)	3(3.8%)	10(8.6%)
Some time	25(62.5%)	29(43.9%)	25(32.1%)	42(36.2%)
Always	15(37.58%)	36(54.5%)	50(64.1%)	64(55.2%)
PPE usage				
No	0	0	21(26.9%)	31(26.7%)
Some time	5(12.5%)	12(18.2%)	35(44.9%)	56(48.3%)
Always	35(87.5%)	54(81.8%)	21(26.9%)	29(25.0%)
Inspection machine/vehicle				
No	1(2.5%)	12(18.2%)	14(17.9%)	25(21.6%)
Some time	8(20.0%)	34(51.1%)	37(47.4%)	53(45.7%)
Always	31(77.5%)	20(30.3%)	26(33.3%)	38(32.8%)

4.3.1 The type of PPE usage of informal workers

The high frequented PPE usage in taxi drivers were safety belt and mask. All of motorbike taxi used safety helmet (100%) followed by mask during work (37.9%) gloves (36.4%) and glasses (6.1%). The high frequented PPE used in hairdressers were gloves (57.5%) followed by mask (32.1%) and glasses (9.0%) and the high frequented PPE used in tailors were mask (29.3%) followed by gloves (6.0%). That was presented in table 4.16

Table 4.16 Number and percentage the type of PPE usage of informal workers

PPE type	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
Gloves	0	24(36.4%)	45(57.7%)	7(6.0%)
Mask	1(2.5%)	25(37.9%)	25(32.1%)	34(29.3%)
Glasses	0	4(6.1%)	7(9.0%)	0
Helmet	0	66(100%)	0	0
Safety belt	40(100%)	0	0	0
other	0	0	0	2(1.7%)

4.3.2 The level of safe work behavior

The level of safe work behaviors in taxi drivers mostly showed in high level (77.5%) followed by in moderate level (22.5%).

The level of safe work behaviors in motorbike taxi mostly showed in high level (66.7%) followed by in moderate level (31.8%) and low level (1.5%).

The level of safe work behaviors in hairdressers mostly showed in moderate level (48.7%) followed by high level (43.6%) and low level (6.4%).

The level of safe work behaviors in tailors mostly showed in high (51.7%) followed by moderate level (31.8%) and low level (6.0%). That was presented in table 4.17

Table 4.17 Number and percentage of the level of safe work behaviors of informal workers

Informal workers	safe work behavior level			Mean	S.D.
	low	moderate	High		
Taxi drivers	0	9(22.5%)	31(77.5%)	10.3	1.1
Motorbike taxis	1(1.5%)	21(31.8%)	44(66.7%)	10.0	1.3
Hairdressers	5(6.4%)	39(50.0%)	34(43.6%)	9.1	1.6
Tailors	7(6.0%)	49(42.2%)	60(51.7%)	9.2	1.7

4.4 Part 4: The health problem of working such as disease, treatment for diseases or illness, working conditions and severity of health problems.

This part asked about the perception and experience of informal workers related to the health problem of working such as disease, treatment for disease or illness, working conditions and severity of health problem.

4.4.1 Disease

The taxi driver informed about high frequented disease that they didn't experience diseases (70.0%) followed by had disease (30.0%). The major diseases

were hypertension (50.0%) followed by allergy and diabetes (16.7%), asthma (8.3%) and other disease (8.3%).

The high frequented disease among motorbike taxi. They didn't experience diseases for 84.8% followed by had disease (15.2%). The major diseases were other diseases (60.0%) such as lung diseases, gout and Hepatitis B followed by allergy (30.0%) and hypertension (10.0%).

The hairdressers didn't have disease (74.4%) followed by had disease (25.6%). The major diseases were allergy (50.0%) followed by hypertension (20.0%), heart disease (15.0%), asthma (10.0%) and diabetes (5.0%).

Whereas, tailors didn't experience disease (52.6%) followed by had disease (47.4%).The major diseases were allergy (41.8%) followed by hypertension (27.3%), diabetes (14.5%), asthma (9.1%) and heart disease (7.3%). Those were presented in table 4.18

Table 4.18 Number and percentage the type of diseases among informal workers

	Taxi drivers	**Motorbike taxi**	**Hairdresser**	**Tailors**
No	28(70.0%)	56(84.8%)	58(74.4%)	61(52.6%)
Yes	12(30.0%)	10(15.2%)	20(25.6%)	55(47.4%)
Hypertension	6(50.0%)	1(10.0%)	4(20.0%)	15(27.3%)
Heart disease	0	0	3(15.0%)	4(7.3%)
Diabetes	2(16.7%)	0	1(5.0%)	8(14.5%)
Allergy	2(16.7%)	3(30.0%)	10(50.0%)	23(41.8%)
Asthma	1(8.3%)	0	2(10.0%)	5(9.1%)
other	1(8.3%)	6(60.0%)	0	0

4.4.2 Working conditions problem

The question asked about the opinion related to the working conditions of informal workers.

The high frequented risk in working conditions of taxi drivers were from poor working posture (80.5%) followed by dust exposure (17.1%).

The high frequented risk in working conditions of motorbike taxi were from poor working posture (35.3%) followed by dust exposure (33.1%), high temperature exposure (25.9%).

The high frequented risk in working conditions of hairdressers were from poor working posture (20.8%) followed by dust exposure (17.3%), heat (14.3%), usage of chemical substance (11.9%), poor light (11.3%) and heavy lifting (10.1%).

The high frequented risk in working conditions of tailors were from poor working posture (35.2%) followed by dust exposure (21.0%) and heavy manual lifting (12.3%). That was presented in table 4.19

Table 4.19 Number and percentage caused of heath problem and illness in working condition of informal workers.

Opinion related to health problem and their working conditions	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
No health problem	6(15.0%)	16(24.2%)	33(42.3%)	33(28.4%)
Yes, they had some problems	34(85.0%)	50(75.8%)	45(57.7%)	83(71.6%)
Expose heat	1(2.4%)	36(25.9%)	24(14.3%)	12(5.5%)
Noise	0	4(2.9%)	11(6.5%)	12(5.5%)
Extreme light	0	3(2.2%)	13(7.7%)	20 (9.1%)
Poor light	0	0	19(11.3%)	17(7.8%)
Chemical exposure	0	0	20(11.9%)	8(3.7%)
Dust	7(17.1%)	46(33.1%)	29(17.3%)	46(21.0%)
Heavy lifting	0	1(0.7%)	17(10.1%)	27(12.3%)
Poor working posture	33(80.5%)	49(35.3%)	35(20.8%)	77(35.2%)

4.4.3 The symptom of health problem and illness of informal workers

The symptom of health problem and illness in taxi drivers mostly showed in slightly pain (75.8%) caused by poor working posture and the symptom of dust exposure mostly showed in no symptom (57.1%) and rash on the skin (28.6%).

The symptom of health problem and illness in motorbike taxi mostly showed in slightly pain (71.4%) followed by moderate level (to take medicine) (10.2%) caused by poor working posture. They had the symptom of dust exposure mostly showed in rash on the skin (47.8%) followed by no symptom (39.1%) and respiratory irritation (10.9%). The symptom of high temperature exposure mostly showed in no symptom (50.0%) thirsty and heavy sweat (38.9%)

The symptom of health problem and illness in hairdressers mostly showed in no symptom (51.4%) followed by slightly pain (40.0%) caused by poor working posture. They had health symptom from dust exposure mostly showed in no symptom (79.3%) followed by rash on the skin (10.3%). They had the symptom from chemical exposure mostly showed in no symptom (80.0%) and rash on the skin (20.0%).

The symptom of health problem and illness in hairdressers mostly showed in slightly pain (48.1%) and no symptom (39.0%) caused by poor working posture. They had symptom from dust exposure mostly showed in respiratory irritation (21.7%) and rash on the skin (13.0%). That was presented in table 4.20

Table 4.20 Number and percentage of symptom of informal workers.

	Taxi driver	**Motorbike taxi**	**Hairdressers**	**Tailors**
high temperature or work in outdoor	1(2.4%)	36(25.9%)	24(14.3%)	12(5.5%)
no symptom	0	18(50.0%)	18(75.0%)	12(75.0%)
thirsty and heavy sweat	1(100%)	14(38.9%)	3(12.5%)	1(8.3%)
rash on the skin	0	4(11.1%)	2(8.3%)	1(8.3%)
cramp	0	0	1(4.2%)	1(8.3%)

Table 4.20 Number and percentage of symptom of informal workers. (cont.)

	Taxi driver	Motorbike taxi	Hairdressers	Tailors
Noise	0	4(2.9%)	11(6.5%)	12(5.5%)
no symptom	0	3(75.0%)	8(72.7%)	9(75.0%)
annoyed	0	1(25.0%)	2(18.2%)	2(16.7%)
deafness	0	0	1(9.1%)	1(8.3%)
Extreme light	0	3(2.2%)	13(7.7%)	20 (9.1%)
No symptom	0	2(66.7%)	7(53.8%)	20 (70.0%)
Stress eye	0	0	2(15.4%)	3(15.0%)
Eye irritation	0	0	3(23.1%)	2 (10.0%)
headache	0	1(33.3%)	1(7.7%)	1 (5.0%)
Poor light	0	0	19(11.3%)	17(7.8%)
No symptom	0	0	13(68.4%)	13(76.5%)
Eye strain	0	0	2(10.5%)	1(5.9%)
Sore eye	0	0	1 (5.3%)	2(11.8%)
Headache	0	0	3(15.8%)	1(5.9%)
Dust	7(17.1%)	46(33.1%)	29(17.3%)	46(21.0%)
no symptom	4(57.1%)	18 (39.1%)	23(79.3%)	29 (63.0%)
rash on the skin	2(28.6%)	22(47.8%)	3(10.3%)	6(13.0%)
respiratory irritation	1(14.3%)	5(10.9%)	2(6.9%)	10(21.7%)
suffocate	0	1(2.2%)	1(3.4%)	1(2.2%)
Expose chemical substance		0	20(11.9%)	8(3.7%)
No symptom	0	0	16(80.0%)	7(87.5%)
Rash on the skin	0	0	4(20.0%)	1(12.5%)
Eye and nose irritation	0	0	0	0

Table 4.20 Number and percentage of symptom of informal workers. (cont.)

	Taxi driver	**Motorbike taxi**	**Hairdressers**	**Tailors**
Heavy lifting	0	1(0.7%)	17(10.1%)	27(12.3%)
No symptom	0	1 (100.0%)	13(76.5%)	19(70.4%)
Slightly pain	0	0	3(17.6%)	5(18.5%)
Moderate pain to take medicine	0	0	1(5.9%)	2(7.4%)
High pain to treatment	0	0	0	1(3.7%)
Poor posture	33(80.5%)	49(35.3%)	35(20.8%)	77(35.2%)
No symptom	5(15.2%)	9(18.4%)	35(51.4%)	30(39.0%)
Slightly pain	25(75.8%)	35(71.4%)	14(40.0%)	37(48.1%)
Moderate pain	2(6.1%)	5(10.2%)	3(8.6%)	10(13.0%)
High pain to treatment	1(3.0%)	0	0	0

4.5 Part 5: Occupational health risk in work place and prevention measure by job safety analysis

The occupational health risk of informal workers resulted from the sharing idea, disusing and analyzing. The details related to jobs by identify the risk and the researcher asked the group to suggest for the prevention measure. The discussion focused on “how to” for example, how do you work, what do you use in this step etc. The researcher explains the aim of this study and the step of job safety analysis to 10-15 leaders and volunteers. That result of job safety analysis showed in table 4.21

Table 4.21 The job safety analysis of taxi drivers.

Task of job	Hazard/Risk	Prevention measure/control
1. Move the car from garage	1.1 The car crash	1.1.1 Inspect car before using. Check brake or taillights. 1.1.2 No objects to obstruct the cars.
2. Driving	2.1 crash	2.1.1 Should use a safety belt. 2.1.2 Carefully use safe speed and do not use over speed. 2.1.3 Should get a certified driver training and valid licensing. 2.1.4 No alcohol consumption. 2.1.5 Don't use a mobile phone during drive. 2.16 Should follow traffic laws.
	2.2 brake broken	2.2.1 Should inspect oil brake. 2.2.2 Should test brake before driving.
	2.3 back pain	2.3.1 Should set a proper sitting adjustable height, seat, lumbar and arm. 2.3.2 Should change body movement and get a short break time.
	2.4 eye pain from extreme light	2.4.1 Should wear glasses for protection extreme lighting and ultraviolet.
	2.5 dust	2.5.1 Always clean the car and air conditioning.

Table 4.21 The job safety analysis of taxi drivers. (cont.)

Task of job	Hazard/Risk	Prevention measure/control
	2.6 Heat from high temperature	2.6.1Always checks air conditioning and cleans it regularly.
	2.7 Fatigue/Stress	2.7.1 Provide the short break for body relax and consider for adequate sleep.
3. Stop the car to drop passengers	3.1 Dust and smoke from exhaust pipe car	3.1.1 Should use mask.
	3.2 The car crash or slip	3.2.1 Always uses manual brake.
	3.3 Back pain	3.3.1 Manual lifting with appropriate correct posture.

Conclusion: the result of identified hazard among taxi drivers found the accident by car accident. The health problem such as back pain, hand pain and shoulder pain caused by poor working condition, dust exposure caused by exhaust pipe car, heat caused by high temperature and eye pain caused by extreme light that agree with the result from questionnaires found the highest accident was car accident and the high frequented risk in working conditions were poor working conditions and dust exposure. The taxi drivers got muscle fatigue especially low back pain and were stressful. The short break was mentioned during the discussion. That result of job safety analysis showed in table 4.22

Table 4.22 The job safety analysis of motorbike taxi

Task of job	Hazard/Risk	Prevention measure/control
1. Move the motorcycle from garage	1.1 The car crash	1.1.1 Inspect car before using. Check brake or taillights. 1.1.2 No objects to obstruct the cars.
2. During rides	2.1 crash	2.1.1 Should wear helmet. 2.1.2 Carefully use safe speed and do not use over speed. 2.1.3 Should get a certified driver training and valid licensing. 2.1.4 No alcohol consumption. 2.1.5 Don't use a mobile phone during drives. 2.16 Should follow of traffic laws.
	2.2 Slip or fall	2.2.1 Don't use over speed especially during raining to . 2.2.2 Inspect brake. 2.2.3 Don't over load of passengers.
	2.3 back pain, shoulder/arms	2.3.1 Should sit in appropriate posture and conditions. 2.3.2 Should change body movement and get a short break time.
	2.4 eye pain	2.4.1 Should wear glasses for protection extreme lighting and ultraviolet.

Table 4.22 The job safety analysis of motorbike taxi (cont.)

Task of job	Hazard/Risk	Prevention measure/control
	2.5 Dust and smoke from exhaust pipe car.	2.5.1 Should use mask 2.5.2 Should take a bath after finishing work immediately
	2.6 Heat caused by high temperature	2.6.1 Should wear long sleeves or use skin lotion for UV protection. 2.6.2 Should wear gloves. 2.6.3 Should drink a lot of water. 2.6.4 Provide short break time.
	2.7 Noise	2.7.1 Should use earring protection.
	2.8 Vibration	2.8.1 Do not use over speed especially on none safe roads.
3. parking	3.1 Fall	3.1.1 Should stop engine and change for free gear.

Conclusion: the result of identified hazard in among motorbike taxis found the accident by car accident. The health problem such as back pain, hand pain and shoulder pain caused poor working condition, dust exposure caused by exhaust pipe car, heat caused by high temperature, noise from the vehicle, and eye pain caused by extreme light that agree with the result from questionnaires found the highest accident was car accident and the high frequented risk in working conditions were poor working condition such as the road conditions, dust exposure, noise and high temperature. That result of job safety analysis showed in table 4.23

Table 4.23 The job safety analysis of hairdressers

Task of job	Hazard/Risk	Prevention measure/control
1. Prepare equipments and tools	1.1. Equipment or tool fall down	1.1.1 Should put them in appropriate containers. 1.1.2 Good designed solon lay- out and furniture.
2. Wash hair	2.1 Shampoo splash to eye 2.2 Irritation /hand aczema caused by using shampoo	2.1.1 Should wear glasses. 2.1.2 Should wear gloves and clean hand after finishing immediately.
3.Cut hair	3.1 Sharp/stabbing/wound from scissors	3.1.1 Should work with sharp items carefully. 3.1.2 Provide safe storage.
	3.2 Wrist pain caused by repeated in same posture	3.2.1 Should keep equipment within reach. 3.2.1 Should use a proper scissors.
	3.3 Shoulder/neck/back pain caused by repeated in same posture and reach	3.3.1 Should adjust the height bed. 3.3.2 Should store shampoo within reach.
	3.4 legs problem caused by prolong standing	3.4.1 Should wear footwear and working with good flooring materials leading to standing comfortable. 3.4.2 Provide a short break.

Table 4.23 The job safety analysis of hairdressers (cont.)

Task of job	Hazard/Risk	Prevention measure/control
4.Relaxer , hair wave , Permanent hair colour, powder bleach	4.1 Skin irritation from expose chemical substance	4.1.1 Provide safety data sheet in salon, got training follow manufacture's instruction. 4.1.2 Should wear proper gloves. 4.1.3 Reduce the handling or expose chemical.
	4.2 Respiratory irritation	4.2.1 Should wear mask. 4.2.2 Provide adequate ventilation. 4.2.3 Use chemical substance at the appropriate concentration follow instruction. 4.2.4 Shall reseal containers immediately after using.
	4.3 Chemical substance splash to eye.	4.3.1 Should wear glasses.
	4.4 shoulder, neck/back/arms pain	4.4.1 Adjust workstation for proper working. 4.4.2 Provide short break. 4.4.3 Adjust the height of cutting stool, chair to proper arms shoulder 4.4.4 To keep the materials, tool, chemical storage within easy to

Table 4.23 The job safety analysis of hairdressers (cont.)

Task of job	Hazard/Risk	Prevention measure/control
		reach. 4.4.5 Use footwear and working with good flooring materials for standing comfortable.
	4.5 Fire	4.5.1 Provide a safe storage. 4.5.2 Should check the properly seal container. 4.5.3 Storage chemical substance as directed by the manufacture. 4.5.4 Should keep the chemical substance out of reach of children. 4.5.5 Keep away from ignition for flammable materials.
5. Hair steam	5.1 exposed to heat	5.1.1 Should wear cloth protective. 5.1.2 Should wear gloves for heat contact.
6. Blow drying	6.1 exposed to heat	6.1.1 Should wear cloth protective.
	6.2 electrical shock	6.2.1 Should check or inspect electricity and electric cable before using. 6.2.3 Don't use damaged

Table 4.23 The job safety analysis of hairdressers (cont.)

Task of job	Hazard/Risk	Prevention measure/control
		electrical line 6.2.4 Don't touch electricity, switches with wet hand. 6.2.5 Should store electrical line away from wet or moist conditions.
	6.3 Arms and fingers pain.	6.3.1 Don't handle any equipment. 6.3.2 Don't use sharp of equipment to handle and minimize awkward wrist position.
7. Clean container ,floor cloth and hazard waste management	7.1 Hazardous waste	7.1.1 Provide separation of waste. 7.1.2 To keep hazardous waste in appropriate area.
	7.2 Skin irritation	7.2.1 Should wash hand immediately after finishing work. 7.2.2 Should wear gloves. 7.2.3 Should clean cloth and all equipments. 7.2.4 Should clean up spillages floor.

Conclusion: the result of identified hazard in among hairdressers found the cutting injuries and electrical shock. The health problem such as back pain, hand pain and shoulder pain arm pain caused by repeated work in same posture, legs pain caused

by prolong standing and, exposed to chemical substance such as by shampooing step and hair-coloring step, that all were agreed with the result from questionnaires found the highest accident from cutting injuries by scissors and the high frequented risk in working conditions were poor working condition and dust exposure and chemical exposure. That result of job safety analysis showed in table 4.24

Table 4.24 The job safety analysis of tailors

Task of job	Hazard/Risk	Prevention measure/control
1.Prepare equipment, and sketch	1.1 back pain	1.1.1 Don't use manual lifting in over load. 1.1.2 Use proper designed of table height. 1.1.3 Should keep materials or equipments within reach.
2. cutting	2.1 cut and injures from scissors, knife blades and pins.	2.1.1 Work carefully 2.1.2 Should keep pins, scissors and needle by separate compartment or in box. 2.1.3 Should wear a thimble when cutting.
	2.2 dust from textiles	2.2.1 Should were mask. 2.2.2 Provide good ventilation in area. 2.3.3 Always cleaning immediately after finishing.
3.Needle and Thread	3.1 Fingers injures	3.1.1 Should wear thimble in fingers. 3.1.2 Used the appropriate thread technique.

Table 4.24 The job safety analysis of tailors (cont.)

Task of job	Hazard/Risk	Prevention measure/control
4.Sewing work	4.1 Fingers injures	4.1.1 Should wear thimble in fingers. 4.1.2 Don't race the sewing machine at high speed. 4.1.3 Don't touch a needle when sewing and turn of machine after finishing.
	4.2 back, shoulder, neck, arms, legs injures caused by prolong sitting and repeated work in same posture	4.2.1 Adjust the table height. 2.4.2 Adjust the chair for comfortable position. 2.4.3 Adjust the back rest to support back and support feet. 2.4.5 Provide the short break. 24.6 Should store pin, needle, scissors and other equipment within reach.
	4.3 eye strain	4.3.1 Provide adequate lighting.
	4.4 electrical shock from machine and iron	4.4.1 Always check sewing machine. 4.1.2 Don't touch sewing machine with wet hands or feet. 4.1.3 Provide feet protection.

Table 4.24 The job safety analysis of tailors (cont.)

Task of job	Hazard/Risk	Prevention measure/control
	4.5 dust	4.5.1 Should wear mask. 4.5.2 Always clean room. 4.5.3 Provide good ventilation in room.
	4.6 vibration from machine	4.6.1 Provide protection support seat and feet. 4.6.2 Provide short break
	4.7 skin irritation caused by chemicals from textile material	4.7.1 Should wear cloth protection. 4.7.2 Always wash hand. 4.7.3 Should wear gloves.
5. Ironing	5.1 exposed to heat	5.1.1 Avoid touch the iron. 5.1.2 Provide the area for put the iron.
	5.2 Back, shoulder and leg pain caused by prolong sitting and repeat in same posture	5.2.1 Adjust the height table for proper to work. 5.2.2 Should wear footwear and work with good flooring materials for standing comfortably. 5.2.3 Provide short break.
	5.3 Electrical shock	5.3.1 Always check iron and electrical cable. 5.3.2 Don't touch iron with wet hands.
6. To fold and packing	6.1 Back, shoulder pain	6.1.1 Adjust the table height for proper work. 6.1.2 Don't manual lifting over load.

Conclusion: the result of identified hazard in among tailors found the accident were finger injury by scissors and needle and the electrical shock. The health problem such as back pain, hand pain and shoulder pain arm pain caused by manual lifting overload, repeated work in same posture and prolong sitting and standing and poor working condition such as poor posture, dust exposed caused by textile, exposed to heat caused by iron, exposed to noise caused by saw machine and poor light. These finding agreed with the result from questionnaires found the highest accident from finger injury by scissors and needle the high frequented risk in working conditions were poor working condition and dust exposure.

The level of occupational health risk of informal workers

The level of occupational health risk in taxi drivers and motorbike taxi mostly showed in moderate level 82.5% and 66.7% followed by low risk level 17.5 and 33.3%, respectively.

The level of occupational health risk in hairdressers mostly showed in moderate level 59.0% followed by low risk level 38.5% and high risks 2.5%.

The level of occupational health risk in tailors mostly showed in low level 51.7% followed by moderate risk level 46.6% and high risks level 1.7%. That was presented in table 4.25

Table 4.25 Mean, percentage and standard deviation and the level of occupational health risk of informal workers.

Informal workers	Occupational health risk level				Mean	S.D.
	low	moderate	High	Highest		
Taxi drivers	7(17.5%)	33(82.5%)	0	0	26.56	2.31
Motorbike taxis	22(33.3%)	44(66.7%)	0	0	27.34	2.56
Hairdressers	30(38.5%)	46(59.0%)	2(2.5%)	0	25.40	4.43
Tailors	60(51.7%)	54(46.6%)	2(1.7%)	0	24.98	3.69

Table 4.26 The statistic difference of safe work behaviors, health problem and occupational health risk level between groups and within the groups

Behavior , problem and risk		SS	df	Mean square	F	p value
Safe work Behavior	Between groups	5.786	3	1.929	6.001	.001*
	Within groups	94.822	295	.321		
	Total	100.6	298			
Health problem	Between groups	.295	3	.098	2.139	.095
	Within groups	13.022	283	.046		
	Total	13.3	286			
Occupational Health risk	Between groups	47.44	3	15.81	1.56	0.198
	Within groups	2940.74	291	10.10		
	Total	2988.2	294			

* Level of statistical significance at p value of < 0.05

The safe work behaviors were significantly difference from those of informal workers between groups at P<0.05, but the level of health problem and level of occupational health risk of informal workers: taxi drivers, motorbike taxi, hairdressers and tailors were not different. Then the safe work behavior would be further analyzed by Scheffe. That was presented in table 4.27

Table 4.27 The multiple comparisons of work safe behaviors level of informal workers.

Occupation	$\overline{X}$	**Taxi drivers**	**Motorbike taxi**	**Hairdressers**	**Tailors**
		2.77	**2.65**	**2.37**	**2.45**
Taxi drivers	2.77	-	.12	.39*	.32*
Motorbike taxi	2.65	-	-	.27*	.19
Hairdressers	2.37	-	-	-	.08
Tailors	2.45	-	-	-	-

* Level of statistical significance at p value of < 0.05

The comparisons of safe work behaviors level found in hairdressers significantly lower than those of taxi drivers and motorbike taxi at P<0.05 and the level of work safe behavior of motorbike taxi was significantly higher than those of tailors at P<0.05. As mentioned earlier that the safe work behavior among hairdressers and tailor were low.

4.6 Part6: Health care service data.

The treatment of disease or illness of informal workers

Most of taxi drivers went to clinic as same as visited hospital to receive health service when they had illness (60.0%), followed by buying medicine themselves (55.0%) and receive health service at public health center (25.0%).

Most of motorbike taxi went to clinic and as same as visited hospital to receive health service when they had illness (74.2%) followed by receive health service at public health center (66.7%), buying medicine themselves (30.3%) and no treatment (1.5%)

Most of hairdressers got health service when they had illness at clinic (27.3%) followed by buying medicine themselves (23.8%), at public health center (23.2%) and visited hospital (21.7%), using herb (2.5%) and no treatment (1.5%)

Most of tailors brought medicine themselves when they had illness (30.2%) followed by visited the hospital (24.0%), went to clinic (23.1%), public health center (20.9%) and using herb (1.8%). That was presented in table 4.28

Table 4.28 Number and percentage the treatment disease or illness of informal workers

Type of treatment	Taxi drivers	Motorbike taxi	Hairdresser	Tailors
No treatment	0	1(1.5%)	3(1.5%)	0
Buying medicine themselves	22(55.0%)	20(30.3%)	47(23.8%)	68(30.2%)
Public health center	10(25.0%)	44(66.7%)	46(23.2%)	47(20.9%)
Clinic	24(60.0%)	49(74.2%)	54(27.3%)	52(23.1%)
Hospital	24(60.0%)	49 (74.2%)	43(21.7%)	54(24.0%)
Using Herb	0	0	5 (2.5%)	4(1.8%)
Other	0	0	0	0

Then researcher investigates the existing health care service of the National Health Security office, Bangkok branch (region13). That results as follows:

1) Prenatal care for pregnant.
2) Examination and confirm Thalassemia in pregnant and husband.
3) Family health plan service
4) Examination in Hypothyroidism.
5) Promotion immunization for child 0-14 years.
6) Evaluation child develop 0-5 years.
7) Examination cancer in women.
8) Examination in high risk group of metabolic disease.
9) Change behaviors in metabolic disease.
10) Counseling for diabetes and hypertension patients.
11) Surveillance of depressive disorders.

The expense for health service by Universal Health care coverage.

1) Examination and health service child development and nutrition.

2) Promotion immunizations according to the National Immunization program.

3) Annual physical check up in high risk group.

4) Family planning service.

5) Antinetroviral medication for the prevention of mother-to-child transmission of HIV.

6) Home visit and Home health care.

7) Counseling.

8) Health promotion for dental service.

9) Treat by radiation

10) Medical examination and diagnosis

11) Examination and pre-natal care for pregnant woman and coverage to health promotion for pregnant woman.

12) Medical examination diagnosis treatment and rehabilitation until the treatment ends including alternative medical care as recognized by the medical registration committee.

13) Medical treatment in chronic renal failure.

14) Dental service such as extraction, filling, scaling, plastic-based denture, milk- tooth, nerve-cavity treatment and placement of artificial palate in child with harelip and cleft palate.

15) Medicine, medical supplies, organ substitutes and medical equipments.

16) Childbirth, delivery service, totaling for no more 2 deliveries.

17) Meal and room charges.

18) Newborn and child care.

19) Physical and mental rehabilitation.

CHAPTER V
DISCUSSION

The result of this study aiming to assess the occupational health risk of informal workers among in taxi drivers, motorbike taxis, hairdressers and tailors in Bangkok are discussed as follows:

5.1 Discussion of study design

5.2 Discussion of study results

This part would be introduced into 6 topics as the following.

5.2.1 The characteristics of informal workers and health behaviors such as age, gender, address, occupational, education, sleeping time, alcohol consumption, smoking, and exercise.

5.2.2 The perception of occupational health risk, experience and severity of accident.

5.2.3 The safe work behaviors

5.2.4 The health problem of working such as disease, treatment diseases or illness, working condition and severity of health problems.

5.2.5 Occupational health risk and its prevention measure by job safety analysis

5.2.6 Health care service data

5.1 Discussion of study design

This study design divided into two steps. It was the cross study design. In the first step was the investigation demographic characteristic, health behavior such as age, gender, address, occupational, education, sleeping time, alcohol consumption, smoking, and exercise, the perception occupational health risk experience, and severity of accident. The secondary step was a study of multiple comparisons of the safe work behavior, health problem, and occupational health risk. The error of data

collection and analysis in this study were from the random error and the systematic error as discussed bellows;

5.1.1 Random error

In this study, the random error can be occurred in the selection of population. Researcher performed the selection of the population by purposive sampling method, it was the most practical and convenience process and most of those of informal workers were working in Bangkok and were the high risks group from the literature review, the researcher controlled by selection 4 groups of informal workers for 300 workers.

5.1.2 Systematic error

5.1.2.1 Instrument error

The questionnaire and JSA form were used in this study. The questionnaire was composed 4 parts- 1) the characteristic of population and health behaviors. 2) Perception occupational health risk, severity and experience of accident. 3) Safe work behavior 4) Disease, health and working condition problem. The questionnaire approved by expert working with informal workers and health. The researcher tested the questionnaires in 25 motorbike taxi and determined reliability test by Cronbach's Coefficient of Alpha. The score of safe work behavior and health problem was 0.491, 0.884, respectively. The weak of the survey data might came from low reliability value in the part of safe work behavior. But it was limitation in the duration of this study. It would be recommended for the improvement of the questionnaire in the future. In addition, the error from questionnaires can occur from the non-response or uncompleted answer. The researcher controlled by did not register or deleted this data.

5.1.2.2 Method error

The method error might come from the JSA technique and data collection. The error in JSA technique can occur by the miss understanding in JSA technique. The researcher reduced this error by explaining the JSA technique before assess the risk and selected the health leader to the discussion. The data collection method error might from the process during the data. The researcher reduce the

missing data by explained the objective of this study and definitions of term to the subjects before starting the data collection.

5.1.2.3 Personal error

The personal error might come from the JSA discussion and data collection. JSA and data collection were done by only one researcher. It would be the minimization of this type of error.

5.2 Discussion of study results

5.2.1 The characteristics and health behavior of informal workers

The highest number of informal workers was tailors followed by hairdressers, motorbike taxi and taxi driver. Most of them were female. They were 42 years old on average. The maximum age of informal worker was 74 years old and minimum age was 18 years old.

Most of informal workers had been educated in primary school followed by secondary school, vocational and bachelor degree. The results agreed with the study of Aniruth M. that,the education level of informal workers is normally not at high level. [8] Their length of work experience ranged from 1-5 years followed by more than 25 years and 12.54 year on average.

Most of informal workers had sleeping time less than 8 hours per day and most of informal workers did not exercise. This is because of the characteristics of work of informal workers was not fixed, many report showed that their jobs are not stable, it depended much on the order or market demand. [5,7,11,42]

A majority of male subjects were alcohol drinker, mostly showed in motorbike taxi followed by taxi driver, hairdressers and tailor. Most of motorbike taxi and taxi drivers were smokers. This is similar to many paper showed that smokers and alcohol consumers are normally male workers.[5,11,17,42,43] A total of cigarette was 10-20 cigarettes per day of motorbike taxi and less than 10 cigarettes per day of taxi drivers.

5.2.2 The perception of occupational health risk, experience and severity of accident.

5.2.2.1 The perception of occupational health risk

Most of taxi drivers and motorbike taxi drivers had a perception of occupational health risk in their working higher than the perception of occupational health risk in hairdressers and tailor. It agreed with the previous the studies of Richard F.et al. They studied motorbike taxi in Gana, it was found that the perception of motorbike taxi for wearing helmet, it leaded to prevent or reduce head injury. (40)

5.2.2.2 Accident and the severity of accident

Taxi driver

The highest work -related accident in taxi drivers was car accident and mostly showed in slightly level. The cause of car accident might came from alcohol, raining, use over speed which was agreed with previous studies from Gana the taxi drivers, workers used over speed,50-100 km/hr and the high speed in 150 km/hr lead to cause accident. (10) The health behavior concerned with car accident such as they did not have an adequate sleep time, or alcohol consumption and they don't use a safety belt. These might play some role in accident, then the prevention of accident need to be more considered.

Motorbike taxi

The majority of accident was car accident followed by slippery. The severity of car accident mostly showed in slightly level. The cause of car accident might from alcohol and poor safe work behaviors such as used no helmet and no checking car. It agreed with the result of Phillipo L.et al, they studied motorcycle injured in Mwanza city, Tanzania, it was found that accident caused by using over-speed. (44) It also agreed with previous studies from Suzan R., it was found that the cause of motorbike taxi accident came from over speed, alcohol, larger engine size, lack of safety training.(45) In addition, the results agreed with Carlos E, it was found the cause of car accident came from alcohol. (46) In this study the data was clear that most of motorbike taxi used beer as same as for whisky.

Hairdressers

The highest accident was cutting injured by scissor followed and electrical shocks. The severity of cutting injured mostly showed in slightly level and moderately level. It agreed with the previous studies in Tainin City, the results showed high prevalence of finger injured by scissors.[12] The health behavior concerned with cutting injury and electrical shocks such as didn't use PPE and did check electrical line. The hairdressers were not being trained for safety at work, and then these workers did not know about the occupational health risk prevention. The knowledge of risk is necessary for this group.

Tailors

The highest work -related accident in tailors was finger injured and injured from needle followed by electrical shock. The finger injured and injured from needle mostly showed in slightly level. It agreed with the results of Chavada V, it was found that tailor fingers injured caused by needle in stitching steps and only seen in tailors work experience less than 20 years. [36] The cause of electrical shocks came from wet feet during working and did not check the sewing machine before working. They protected the electrical shocks by using shoes.

5.2.3 The safe work behaviors in working

Most of taxi drivers sometimes washed hand before eating foods and cleaned body immediately after finishing work. They always used seatbelt whereas they didn't have awareness but they scared of the police and pay for fine as same as in motorbike taxi. They didn't have safety awareness for use helmet but they used helmet because they scared the police and pay for fine. Most of them didn't use mask. They also exposed to dust caused by exhausted pipe car caused respiratory problem. They used handkerchief for protection the air pollution. The handkerchief was not proper to protect the air pollution from exhausted pipe car. Most of them sometimes checked the car or motorcycle before driving.

Most of hairdressers some time washed hand before eating foods and always clean body after finishing work. Most of them didn't use mask and gloves during working with chemicals. The type of gloves to protect chemical substance

didn't proper. They wear plastic gloves. It can not to protection the hazardous from exposed to chemical substance. In some job steps were not comfortable to used gloves such as wash hair by shampoo, these causes of hand aczema or dermatitis. [12,13] It agreed with the previous studies in Sweden, the results showed that most of hairdressers didn't used mask to protected the vapor and mist from hair spray.[14] The mask was made from cloth which cannot protect vapor. Most of them sometimes checked their machines before working.

Most of tailors always washed hand before eating foods and always cleaned body after finishing work. Some of them used mask to protected dust. They exposed to dust in their working process. It agreed with the results of Nalini C. and Razia P., they study in textile garment industrial, it was found the workers exposed to dust and most of tailors lack of PPE.[47] It could be seen that the risk prevention among tailors was not harmonized to the exposure, it is agreed to the previous study . Then as it was discussed before, the occupational health issue among working must be informed by appropriate mechanism.

5.2.4 The health problem such as disease, treatment for diseases or illness, working conditions and severity of health problems.

5.2.4.1 Disease

The major disease in taxi driver was hypertension followed by allergy, diabetes and asthma. It agreed with the studies of Wijit R. et.al, they studied in taxi driver in Jatujuk, it was found the hypertension and allergy in taxi drivers. [11] The diseases of taxi driver were associated with risk in working conditions- which came from poor working posture and dust exposure. The health behavior concerned with health problem and disease such as smoke, alcohol consumption, did not exercise and adequate sleep time. They did not have annual physical health check up. According to the previous studies from Wijit R.,the the results showed taxi driver no annual physical health check up.[11]

The high frequented disease among motorbike taxi was allergy followed by hypertension, asthma, lung diseases, gouty and hepatitis B. Cause of disease might came from dust exposure and poor health behavior such as smoker and alcohol consumption. In this study found that, most of them sometimes used mask to

protection dust but the mask used did not proper to the exposure. These might cause health problem and diseases. They were no annual physical health check up. The result agreed with the study of Wijit R.et al, they studied in motorbike taxi in Jatujak, they found that the high frequented of disease in motorbike taxi and they no annual physical health check up and half of them were alcohol drinker. (11)

The high frequented disease in hairdressers was allergy followed by hypertension asthma and heart disease. The poor working condition such as dust exposure, chemical exposure and the poor safe work behaviors such as smoke, alcohol, did not exercise, inadequate sleep time and no PPE. These might cause of health problem and disease. It agreed with the previous studies in Sweden. The results showed the asthma disease in hairdressers caused by used hair bleaching and hair spray. (14)

The high frequented disease in tailor was allergy followed by hypertension, diabetes and asthma. Hypertension and diabetes mellitus might from the living behaviors or the genetics. The asthma might come from dust exposure and the poor safe work behavior such as using no mask, alcohol, smoke and did not exercise. The results agreed with the study of Michel W.et al, it was found the chronic obstructive pulmonary disease in Tailor.(48)

5.2.4.2 Working conditions and health problem

Expose high temperature and Ultraviolet.

Taxi drivers and motorbike taxi exposed to high temperature and ultraviolet (UV) in workplace. The symptoms of high temperature exposure mostly showed in sweaty and thirsty followed by rash on the skin. It agreed with the previous studies in Saudi Arabia. The results showed the high temperature caused health problem such as heat exhaustion, heat cramp and heat stroke.(28) It also agreed with previous studies of Nalini C, it was found that the high temperature in working conditions causing of health problem. (47)

Noise

The high frequented of noise problem was found in hairdressers followed by in tailors motorbike taxi and taxi drivers. The symptoms of

exposure noise mostly showed in annoyed and moody. Noise might cause hearing loss. The results agreed with the study of Nalini C, it was found that the poor working condition in garment industry came from noise problem, that cause hearing loss among workers.[47] It also agreed with the previous studies of Rejoice S, she studied in taxi drivers, it was found that risks in working condition came from noise caused by their vehicle.[10] whereas this study, it was not found perception of noise problem in taxi drivers. But, the results from JSA showed the risk of noise from drying steps in hairdressers.

Exposure chemical substance

Health problem from chemical was more recognized among this group. The symptoms of expose chemical substance mostly showed in respiratory problem followed by skin irritation and eye irritation. The results agreed with the study of Judith S.et al. They studied in hairdressers in Tanin city, it was found chemical substance in their work such as shampoo, waving and dyeing.[12] It also agreed with previous study from Albin M. et al. They studied in Swedish hairdressers, it was found that hair bleach and hair spray caused asthma.[14] In addition it was agreed with the previous studies in Gana. The results was found in salon used chemical substance such as shampoo, neutralizers, conditioners, peroxide solution, styling gel, setting lotion, hair spray, mouse, relaxer, and nail polish remover. [10] According to the previous study that found the chemical substance from exhausted pipe cars were containing of carbon monoxide, nitrogen oxide and sulphur dioxide.[10] These chemicals might cause some health problems such as respiratory effects which also found in the subjects group. It agreed with the previous study of Moscato G. et al, it was found that the occupational asthma and rhinitis in hairdressers caused by long period of exposure to bleaching agents.[49] The study from Angeline S. et al., they showed the bladder cancer in among hairdressers caused by exposure hair dye.[50] It agreed with the study of Manuela G. et al., bladder cancer in hairdressers in California caused by exposure to hair dyes.[25] The study from Rylander L. et al, the health risk for the reproductive among female hairdressers caused by exposure permanent waving and spraying was found.[51]

Dust

The dust exposure problem mostly showed in motorbike taxi followed by tailors, hairdressers and taxi drivers. The workers exposed to dust in their working process. Dust might cause of skin irritation followed by respiratory problem. It agreed with the previous study of Chris E et al. They studied in urban motorbike drivers in Nigeria, it was found that the respiratory problem and the chronic respiratory symptom caused by dust exposure.[52] In addition, it agreed with the study of Phillipo L. They studied in motorbike taxi, it was found risk in working condition came from dust during riding.[44] In tailors, dust came from cloth, which was mainly their materials. It agreed with the previous studies of Nalini C., she did the study in tailors, it was found that the poor working conditions mainly from dust.[47]

Manual heavy lifting

Some of informal workers had a problem from manual heavy lifting. The heavy lifting problem mostly showed in tailors followed by hairdressers and motorbike taxi. Pain, back pains were common pain found in tailors. In taxi drivers found pain came from prolong sitting in cab. In the study of European taxi found heavy manual lifting caused by lifting overload luggage but in this study not found.[53]

Poor posture

Most of informal workers showed risk in working conditions came from poor working posture such as long sitting position or stand long hour and prolong working in same posture. The poor working posture mostly showed in taxi drives followed by motorbike taxi, tailors and hairdressers. The symptoms of poor working postures mostly showed in slightly pain followed moderately pain. The results agreed with the previous studies of European taxi drivers, it was found that poor working posture caused neck, shoulder and back pain by prolonged sitting position.[53] It also agreed with the previous studies from Rejoice S., it studied in taxi drivers. They showed the cause of sitting in cab leading to spine and musculoskeletal system problem such as back pain, neck problem and waist pain.[10] In addition, it also agreed with previous studied from Masabumi et.al, they studied in taxi drivers in

Tokyo, it was found that low back pain caused by poor working posture.[54] The poor working conditions and poor working of tailors were from in this study. It agreed with the previous studies in India. The results showed pain came from working in same posture such as stitching caused of shoulder pain, neck pain, hand pain and legs pain.[36] As discussed earlier, the poor working condition also found in hairdressers, it might come from poor working posture. This agreed with the study of Hsieh et al, they studied in hairdressers in Taiwan, the hair cutting, washing and blow-drying caused hand and wrists pain.[15]

In addition, the statistical comparison by Scheffe analysis found the working condition of in formal workers: taxi drivers, motorbike taxi, hairdressers and tailors were not different, but the risk analysis, from job safety analysis showed the risk of working condition of informal workers was different because of their working protocols were different.

5.2.4.3 The level of occupational health risk of informal workers

The level of occupational health risk in taxi drivers and motorbike taxi mostly showed in moderately level and the level of occupational health risk in hairdressers mostly showed in moderately level. The level of occupational health risk in tailors mostly showed in low level. As well recognized that it the moderate level of risk need some prevention measures for control the risk. The working conditions and working behaviors for all informal workers need to be improved.

5.2.5 Occupational health risk and its prevention measure by job safety analysis

The result of identified hazard among taxi drivers showed risk in working condition and accident. The accident was car accident that agreed with the results from questionnaires found car accident mostly showed in slightly level. The car accident found during work. It agreed with the previous studies of Barbara J.et al. They studied in taxi drivers, they found the working conditions related to the health problem was poor working posture, body pain was found in Barbara J et al's study. [55] They also found the air pollution such as dust, carbon monoxide and carbon dioxide in working

conditions.[10] The health problem of taxi drivers such as back pain, hand pain and shoulder pain caused by prolonged sitting in cab. The dust exposure caused by exhausted pipe car might cause respiratory problem.

The result of identified hazard among motorbike taxi found the accident occurred in working condition. The major accident was car accident that agreed with the result from questionnaires. The severity of car accidents mostly showed slightly level followed by moderately level. The car accident found during riding. The high frequented risk in poor working conditions such as the road condition dust exposure, noise from the vehicle, and high temperature. The poor working posture found in prolonged sitting.

The result of identified hazard among hairdressers revealed the accident and poor working conditions. The highest accident was cutting injuries by scissors followed by slippery in workplace and electrical shock from electrical equipment that agreed with the result from questionnaires. The health problem such as back pain, hand pain, shoulder pain and wrist pain by repeated work in same posture, legs pain caused by prolonged standing and exposed chemical substance such as by shampooing step and hair-coloring step cause respiratory problem and skin irritation. That all agreed with the result of symptoms found in questionnaires.

The result of identified hazard among tailors found the accident and poor working condition. The major of accidents was finger injured by scissors and injured from needle, slippery and electrical shock. The finger injured by scissors found in cutting cloth and stitching steps. The health problem such as back pain, hand pain shoulder pain and arm pain caused by manual lifting overload, repeated work in same posture and prolong sitting and standing and the poor working conditions such as poor posture, dust exposure, noise cause by sewing machine. Theses finding agreed with the result from the health symptoms questionnaires.

5.2.6 Health care service data

The organization structure of health care unit in Bangkok

Bangkok is managed by Bangkok Metropolitan Administration, BMA office. The manage system of Bangkok is different from some other provinces in Thailand. The public health care unit in Bangkok was worked under BMA, whereas

the health care unit in any province around Thailand could be divided into Tambol health promoting hospital, district hospital and province hospital. The organization chart of BMA had Medical service department and Health department, the Public Health centers there are working on health department as follows;

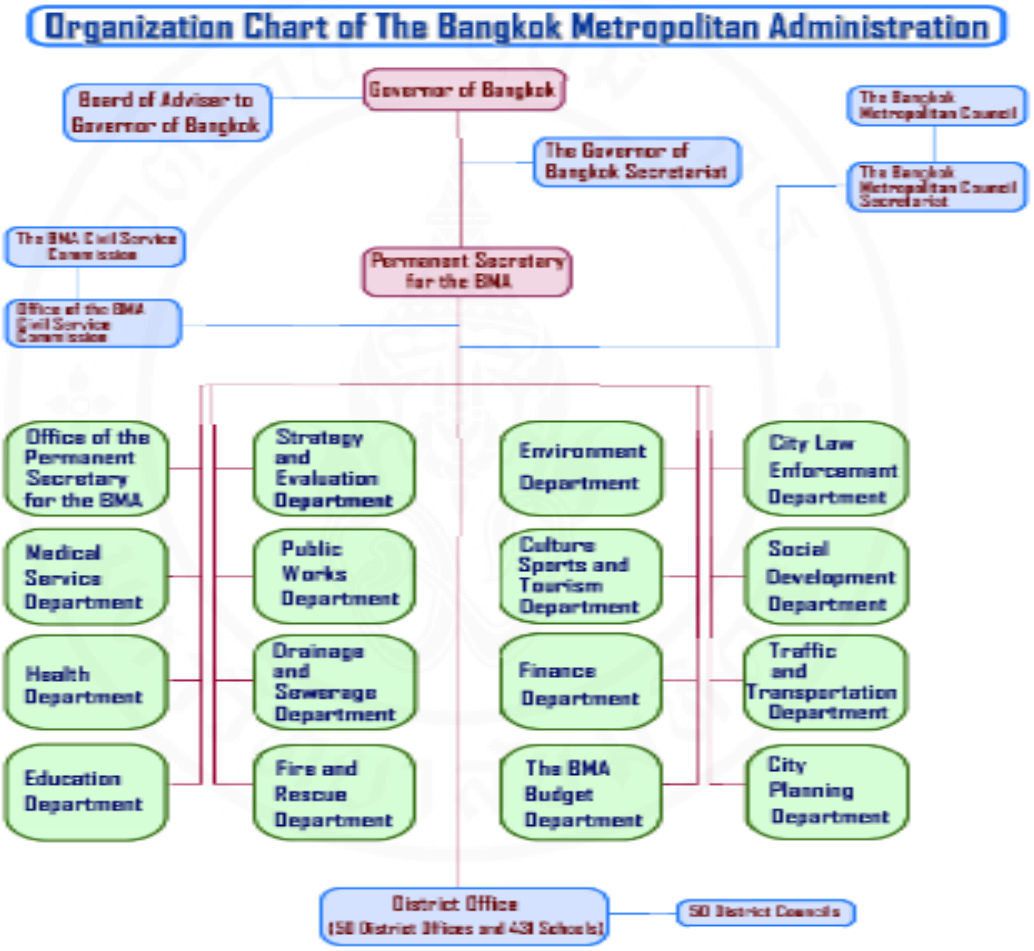


Figure 5.1 The organization chart of the Bangkok Metropolitan Administration

The health care unit in Bangkok divides into two sections as follows;

1) Medical service department: includes 9 hospitals and emergency medical service

2) Health department includes 68 public health centers and medical clinic, where registered with primary health care network. Bangkok resident often visited primary health care unit. The primary health care units mostly are lacking of officers

who are working on occupational health problem of Bangkok resident, also lacking of medical equipment for diagnosis the work- related disease. Therefore the informal workers don't have the occupational health surveillance system provided by local government. There are no system to be registered and to be kept for the record of accident and illness data, the accident investigation, annual physical health check up for Bangkok resident, which some of them are informal workers.

In Thailand, the formal workers who have the social security and working in the industrial section. The social security provides the social security fund and workmen compensation fund for insured person. The insured person entitled to receive the benefits from the fund as prescribed in the social security Act, B.E.2533 (1990) as follows;

(1) Injury or sickness benefits.
(2) Maternity benefits
(3) Invalidity benefits
(4) Dead benefits
(5) Child benefits
(6) Old-age benefits
(7) Unemployment benefits

The workmen's compensation Act B.E. 2537 provides the compensation for the employee in these cases which they suffer from injuries or sickness and employer provide immediately medical treatment and obtain industrial rehabilitation after suffering from injuries or sickness.

In addition, formal workers have safety officers, occupational health and safety department who provide annual physical check up, PPE properly, prevention measure and improved the working condition by regulation and laws such as Occupational Safety, Health and Environmental Act B.E 2554, the standard for administration and management of occupational safety, as prescribed "the employer provide an occupational safety, health and environment training, provide for control and employee to wear standard personal protective equipment". Ministerial regulation on the prescribing of standard for administration and management of occupational safety, health and work environment in relation to heat, light and noise B.E.2459, it

said ‘in case the heat level, noise level and light level inside the work place exceeds standard, the employer should improved or correct the working conditions”.

Nowadays the extending of social security concern from Social Security Act 2533, as amended to state co-payment in section 40 and amend to improve the benefits of section 40 for the incentive of informal workers. It refers to ensured persons who are not employed by the insurer under section 33 and section 39 with age 15-60 years. The basic benefits covered for informal workers (section 40) for three cases, include the injury or sickness benefits, disability benefits, and death benefits (would be paid 100 baht/month) and the benefits covered four cases, include the injury or sickness benefits, disability benefits, death benefits, and the old-age benefits. (would be paid 150 baht/month)

In this study most of informal workers went to clinic followed by buying medicine themselves and went to public health center, when they had some health problems. They went to hospital if they had emergency cases which were referred from primary health care unit. The results agreed with the study from Wijit et al. They studied in motorbike taxi in Jatujak, Bangkok, it was found that the motorbike taxi went to clinic and buying medicine themselves less times consumed for treatment. Some of informal workers went to public health center because the center was not far from their homes and their primary health care unit.

From above information, it showed that health problems are found in informal workers. These health problems might be occupational health related disease. It is discussed here that the knowledge of occupational health, its promotion and prevention are important for them. This knowledge must be informed to all workers. For instance, the risk recognition for each group of workers must be well trained. Health check-up must be implemented in order to inform workers about the their health status, especially the test which is directed response to the exposure for example, vision test to monitor the capacity of eye among taxi driver, motorbike taxi, hairdressers and tailors who having eye fatigue from work. The audio test must be introduced to hairdressers and tailors because they used noisy machine etc. The mechanism for occupational health surveillance might be constructed by working with BMA, via the health care center. The health volunteer, who should be trained on occupational health might be the leader of informal workers. They could be the

important tool for the occupational health problem prevention, promotion and treatment.

CHAPTER VI
CONCLUSION AND RECOMMENDATION

The aims of this study occupational health risk and health problem of informal workers in Bangkok: Those of informal workers included taxi drivers, motorbike taxi, hairdressers and tailors. The populations of this study were 300 informal workers in Bangkok. The data were collect by introducing questionnaires to the subjects and the discussion was conducted for job safety analysis technique for assessment the risk in workplace. This chapter would conclude the finding of this study. It would be divided into 2 parts. The first part informed the occupational health risk and health problem of informal workers. The second part explained the safety standard operation procedure which was the result from the job safety analysis.

6.1 Part 1: The occupational health risk and health problem

The occupational health risk and health problem in taxi drives

Pain was common symptom found in this group. The poor working posture caused by prolong sitting in cab caused shoulder pain, hand pain arms pain and back pain which mostly showed in slightly level of pain. They also exposed to dust caused by exhausted pipe car cause of respiratory problem. The highest work-related accident in taxi drivers was the car accident.

The health behavior concerned with health problem and accident such as adequate sleep time, alcohol consumption, no exercise.

The occupational health risk and health problem in motorbike taxi

Pain was also commons symptom found in motorbike taxi. The workers showed risk in working conditions came from poor working posture followed by dust exposure, high temperature exposure and noise. Shoulder pain, hand pain and back pain from prolong sitting- mostly showed in slightly level. The dust from poor working environmental might cause respiratory problem and skin irritation. It was

noticed that most of motorbike taxi had-never used mask and sometimes they did not wash hand and clean body immediately after finishing work. In addition, hearing loss, heat stroke, heat cramp and heat exhaustion might be their occupational health problem. The same as those of taxi drivers group, the car accident was the highest work-related accident.

The cause car accident might came from alcohol and poor safe work behaviors such as no helmet and no checking car. It indicated that the safe work behavior play an important role among this group.

The occupational health risk and health problem in hairdressers

Health problem from chemical was more recognized among this groups compared to other groups. Most of hairdressers showed risk in working conditions came from poor working condition followed by dust exposure, chemical substance exposure and noise. Legs pain, hand pain and wrist pain were found from prolonged standing and repetitive work. Chemical substances were from many working steps such as hair spray, shampoo, hair bleach, waving and dyeing, these might cause skin irritation, respiratory problem and eyes irritation.

The highest work- related accident was cutting injuries. The severity of accident mostly showed in slightly level. Most of them did not use mask and gloves during working with chemicals.

The occupational health risk and health problem in tailors

Most of tailors showed risk in working conditions came from poor working posture followed by dust exposure and noise. Wrist pain, shoulder pain, arms pain, back pain and legs pain were common pain found in this group. It might from in proper prolonged sitting. The workers also exposed to dust in their working process, theses dust might cause respiratory problem and skin irritation.

The major of accident was finger injury by scissor and injuries from needle followed by electrical shock.

This study confirmed the occupational health problem found in these workers, therefore the appropriate health care service must be provided to these informal workers. It would be explained in this chapter under recommendation part.

6.2 Part 2: The safety standard operation procedure

The occupational health risk of informal workers should control or reduce the risk in workplace as follows;

Table 6.1 The safety standard operation procedure of informal workers.

Before work	During work	After work
Taxi driver		
1. Perform the inspection car before using. Check brake or tailings and oil brake.	1. Carefully use safe speed and do not use over speed.	1. Always clean the car and air conditioning.
2. No objects to obstruct the car.	2. No alcohol consumption.	2. Always uses manual brake.
3. Should test brake before driving.	3. Don't use a mobile phone during drive.	3. Manual lifting with appropriate correct posture.
4. Should get a certified driver training and valid licensing.	4. Should follow traffic laws.	
5. Should set a proper sitting adjustable height, seat, lumbar and arm.		
6. Should use a safety belt.		
Motorbike taxi		
1. Perform inspection car before using. Check brake or tailings.	1. Carefully use safe speed and do not use over speed.	1. Should stop engine and change for free gear.

Table 6.1 The safety standard operation procedure of informal workers. (cont.)

Before work	During work	After work
2. No objects to obstruct the car.	2. No alcohol consumption.	2. Should clean the motorcycle.
3. Should test brake before driving.	3. Don't use a mobile phone during drive.	3. Should take a bath after finishing work immediately.
4. Should get a certified driver training and valid licensing.	4. Should follow traffic laws.	
5. Should wear helmet, mask, and glasses.	5. Should drink a lot of water	
6. Should wear long sleeve cloth or use skin lotion for UV protection.	6. Provide short break time.	
Hairdressers		
1. Good designed solon lay-out and furniture.	1. Should work with sharp items carefully.	1. Provide separation of waste and keep hazardous waste in appropriate area.
2. Should put equipment or tool in appropriate containers.	2. Use chemical substance at the appropriate concentration follows instruction.	2. Should keep the chemical substance out of reach of children.
3. Should adjust the height bed.	3. Should reseal containers immediately after using.	3. Should clean cloth and all equipments.
4. Should store shampoo within reach.	4. Should clean up spillages floor.	4. Should wash hand immediately after finishing work.
5. Provide safety data sheet in salon, got training, follow manufacture's instruction.		

Table 6.1 The safety standard operation procedure of informal workers. (cont.)

Before work	During work	After work
6. Should wear footwear and working with good flooring materials leading to standing comfortable. 7. Should check or inspect electricity and electric cable before using. 8. Should wear mask and gloves. 9. Provide adequate ventilation.		
Tailors		
1. Use proper designed of table height. 2. Provide good ventilation in area. 3. Adjust the table height. 4. Adjust the chair for comfortable position. 5. Adjust the back rest to support back and support feet. 6. Always check sewing machine.	1. Don't touch sewing machine with wet hands or feet. 2. Don't race the sewing machine at high speed. 3. Provide short time break.	1. Turn of the electric equipments. 2. Always clean room. 3. Should store pin, needle, scissors and other equipment within reach. 4. Should cleaning the PPE and keep in good proper condition. 5. Should wash hand immediately after finishing work.

Table 6.1 The safety standard operation procedure of informal workers. (cont.)

Before work	During work	After work
7. Should wear mask and thimble in fingers.		

6.3 Recommendation

The recommendation would explain from the finding of this study and the suggestion for the future study.

It was strong confirmed for the occupational health problems among these studied groups. Therefore, it would be recommended here that health promotions as well as health care service are needs for these informal workers groups. The existing health care services were not cover occupational health risk issues. The mechanism for the occupational health must be implemented; it could be recommended that the JSA, job safety analysis and the participatory training should be providing to informal workers. The leader of workers and the government officer especially, those who are working in 68 health care centers belongs Bangkok Metropolitan Administration Office should be trained. The content of the training should cover basic occupational health risk assessment and its prevention measures. Then, the occupational health database system for informal workers in the community, which contain the detail of informal workers in the community, which contain the detail of informal workers, occupational health risk, occupational injuries and accident report or any health problem data should be established. In addition, the educational institution was the mechanism for the provide knowledge and health surveillance for informal workers or the center of knowledge. This system should be linked to related organization such as the Bangkok Metropolitan, the National Health Security office, the National Health Security office Bangkok branch (Region 13) and the educational institution.

The model of participatory approach on occupational health promotion of informal worker in Bangkok was as follows;

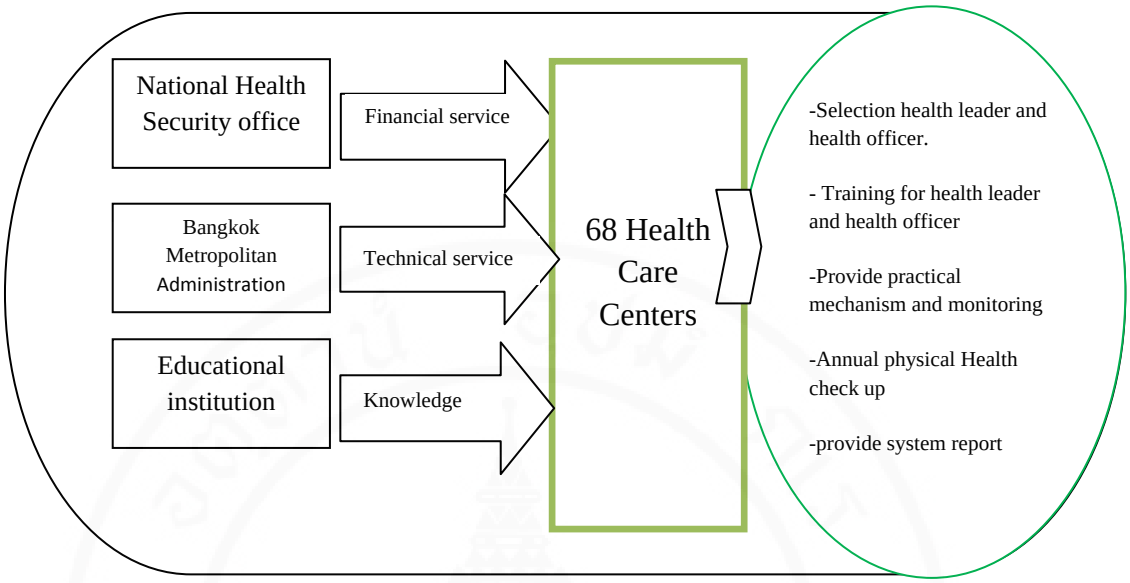


Figure 6.1 The model of participatory approach on occupational health promotion of informal worker

1) Selection the health leader of informal worker and health officer for coordinator between the informal workers with health officer and municipal government.

2) The training for informal worker leader, health volunteer and health officer focuses on occupational health, risk assessment and its measure which harmonized to the specific group.

3) Provide practical mechanism for the monitoring of the prevention measure, such as the assignment to the health volunteer to cover occupational health issue for home visit activity.

4) Provide annual physical health check up for informal workers according to the exposed risk in workplace and health service for the medical treatment.

5) Provide the investigation report and registration system report about health problem and work-related disease.

6.4 The recommendation for future studies

The future study must include industrial hygiene measurement such as for chemical concentration, heat, lighting noise and vibration in workplace to quantifiably identify working conditions problems. The study of the factor effecting health problem must be further done such as the chemical and the hairdressers, chemical and taxi driver etc.

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APPENDIX

แบบสอบถาม

การประเมินความเสี่ยงด้านสุขภาพที่เกิดจากการทำงานของแรงงานนอกระบบในเขตกรุงเทพมหานคร
(ในงานวิจัย ความเสี่ยงด้านสุขภาพที่เกิดจากการทำงานของแรงงานนอกระบบในเขตกรุงเทพมหานคร)
โปรดกรอกข้อความในช่องว่างให้สมบูรณ์ และทำเครื่องหมาย √ใน ☐ ที่เหมาะสมตามความเป็นจริง

วันที่ .....เดือน.....พ.ศ.....

รหัส .....

ส่วนที่ 1 ข้อมูลทั่วไป

1. อายุ.....ปี (นับจำนวนปีเต็มถึงวันที่ตอบแบบสอบถาม)
2. เพศ ☐ 1. ชาย ☐ 2. หญิง
3. ที่อยู่ปัจจุบัน (โปรดระบุเขต) .....
4. อาชีพหลัก ☐ 1. ขับรถแท็กซี่ ☐ 2. ขับรถมอเตอร์ไซด์รับจ้าง ☐ 3. ช่างเสริมสวย ☐ 4. ช่างตัดเย็บเสื้อผ้า
5. สถานะตามอาชีพหลัก ☐ 1. เจ้าของกิจการ/จ้างตนเอง ☐ 2. ลูกจ้าง
6. อาชีพเสริม ☐ 1. ไม่มี ☐ 2. มี (โปรดระบุ).....
7. สถานะตามอาชีพเสริม ☐ 1. เจ้าของกิจการ/จ้างตนเอง ☐ 2. ลูกจ้าง
8. การศึกษา ☐ 1. ไม่ได้รับการศึกษา ☐ 2. ประถมศึกษา ☐ 3. มัธยมศึกษาหรือ ปวช. ☐ 4. อนุปริญญาหรือ ปวส. ☐ 5. ปริญญาตรี

<u>ข้อมูลสุขภาพ</u>

9. ท่านนอนหลับโดยเฉลี่ยวันละ ..... ชั่วโมง
10. ปัจจุบันท่านดื่มเหล้า/เบียร์/เครื่องดื่มที่มีแอลกอฮอล์หรือไม่ (หากตอบดื่มให้ตอบคำถามข้อถัดไป หากตอบไม่ดื่มหรือเคยดื่มแต่เลิกแล้วให้ข้ามไปตอบข้อ 12)

☐ 1.ไม่ดื่ม ☐ 2.เคยดื่มแต่เลิกแล้ว ☐ 3. ดื่ม

11. ปริมาณที่ท่านบริโภคเครื่องดื่มที่มีส่วนผสมของแอลกอฮอล์ในแต่ละครั้งและความถี่ในการดื่มช่วง 12 เดือนที่ผ่านมา

☐ 1. เหล้าขาว ปริมาณ .....กั๊ก ความถี่ในการดื่ม

- ☐ ทุกวัน
- ☐ 5-6 วัน/สัปดาห์
- ☐ 3-4 วัน/สัปดาห์
- ☐ 1-2 วัน/สัปดาห์
- ☐ เดือนละ 1 ครั้ง

☐ 2. เหล้า/ วิสกี้ ปริมาณ .....แก้ว ความถี่ในการดื่ม

- ☐ ทุกวัน
- ☐ 5-6 วัน/สัปดาห์
- ☐ 3-4 วัน/สัปดาห์
- ☐ 1-2 วัน/สัปดาห์
- ☐ เดือนละ 1 ครั้ง

☐ 3. เบียร์ ปริมาณ .....แก้ว ความถี่ในการดื่ม

- ☐ ทุกวัน
- ☐ 5-6 วัน/สัปดาห์
- ☐ 3-4 วัน/สัปดาห์
- ☐ 1-2 วัน/สัปดาห์
- ☐ เดือนละ 1 ครั้ง

☐ 4. ไวน์ ปริมาณ .....แก้ว ความถี่ในการดื่ม

- ☐ ทุกวัน
- ☐ 5-6 วัน/สัปดาห์
- ☐ 3-4 วัน/สัปดาห์
- ☐ 1-2 วัน/สัปดาห์
- ☐ เดือนละ 1 ครั้ง

12. ปัจจุบันท่านสูบบุหรี่/ยาเส้น หรือไม่ (หากตอบไม่สูบ หรือเคยสูบแต่เลิกแล้วให้ข้ามไปข้อ 14)

☐ 1. ไม่สูบ ☐ 2. เคยสูบแต่เลิกแล้ว ☐ 3. สูบ

13. ท่านสูบบุหรี่เฉลี่ยวันละกี่มวน

☐ 1.น้อยกว่า 10 มวน ☐ 2. 10-20 มวน ☐ 3. 21-30 มวน ☐ 4. มากกว่า 30 มวน

14. ท่านออกกำลังกาย หรือเล่นกีฬาบ่อยครั้งแค่ไหน

☐ 1. ไม่ออกกำลังกาย

☐ 2. ออกกำลังกายน้อยกว่า 3 ครั้ง/สัปดาห์ .....นาที/ วัน

☐ 3. ออกกำลังกายมากกว่า 3 ครั้ง /สัปดาห์ ..... นาที / วัน

15. ท่านรับประทานอาหารในแต่ละมื้อตรงต่อเวลาหรือไม่

☐ 1. ไม่ตรงต่อเวลา ☐ 2. ตรงต่อเวลา

ส่วนที่ 2 ข้อมูลการรับรู้ความเสี่ยง

16. ในสถานที่ทำงานหรืออาชีพหลักที่ทำงานอยู่มีสิ่งที่อาจก่อให้เกิดโรค การเจ็บป่วย อุบัติเหตุหรือการบาดเจ็บ ตัวต่อท่าน หรือผู้ร่วมงานหรือไม่

☐ 1. ไม่มี ☐ 2. ไม่แน่ใจ ☐ 3. มี

ข้อคำถาม	คำตอบ
17. ท่านคิดว่าขั้นตอนหรือกิจกรรมใดในการทำงานที่มีอันตรายหรือมีความเสี่ยงที่จะก่อให้เกิดอุบัติเหตุ การบาดเจ็บหรือเจ็บป่วย	ถ้ามี โปรดระบุ..... .....
18. ท่านมีวิธีการป้องกันอันตรายที่เกิดจากการทำงานเพื่อไม่ให้เกิดอุบัติเหตุ การบาดเจ็บหรือเจ็บป่วยของท่านอย่างไร	ถ้ามี โปรดระบุวิธีการ ....

19. ใน 1 รอบปีที่ผ่านมาท่านเคยได้รับอุบัติเหตุ/การบาดเจ็บจากการทำงานหรือไม่

☐ 1. ไม่เคย ☐ 2. เคย

<u>หากตอบว่า **เคย** ให้ระบุปัญหา/อาการระดับความรุนแรงในตาราง (ตอบได้มากกว่า 1 ปัญหา/อาการ)</u>
<u>หากไม่เคยให้ข้ามไปตอบข้อที่ 20</u>

ปัญหา/อาการ (ตอบได้มากกว่า 1 ข้อ)	ระดับความรุนแรง(ตอบได้เพียง 1 ช่อง)			
	เล็กน้อยไม่ต้องหยุดงาน	ปานกลาง หยุดงาน1-3 วัน	รุนแรง หยุดงานมากกว่า 3 วัน	รุนแรงมาก พิการสูญเสียอวัยวะ
19.1 ของมีคมทิ่มแทง บาด (เช่นเข็ม ตำ ตะปูตำ มีดบาด กรรไกรตัดเย็บเสื้อผ้า เป็นต้น)				

19.2 พลัดตก หกล้ม ลื่นไถล				
19.3 ถูกชน กระแทกโดยวัตถุ				
19.4 อุบัติเหตุจากยานพาหนะ ที่ใช้ในการทำงาน/ประกอบอาชีพ				
19.5 อุบัติเหตุจากเครื่องยนต์ เครื่องจักร				
19.6 ไฟฟ้าช๊อต/ไฟฟ้าดูด				
19.7 สารเคมี (เช่น สารเคมีหกรด กระเด็นเข้าตา)				
19.8 ผลจากความร้อนสูงหรือสัมผัสของร้อน(เช่น ไฟไหม้ ท่อไอเสียประคบ)				
19.9 การสั่นสะเทือน				

ข้อมูลส่วนที่ 3 เป็นแบบสอบถามเกี่ยวกับข้อมูลพฤติกรรมความปลอดภัยในการทำงาน

<u>คำชี้แจง</u> ให้ผู้ตอบแบบสอบถาม โปรดใส่เครื่องหมาย √ หน้าข้อที่เลือกหรือเติมคำในช่องว่างในแต่ละคำถามต่อไปนี้

20. ท่านล้างมือทุกครั้งก่อนรับประทานอาหาร หรือไม่

☐ 1. ไม่ล้าง ☐ 2. ล้างเป็นบางครั้ง ☐ 3. ล้างเป็นประจำ

21. ท่านทำความสะอาดร่างกาย หลังเลิกงานทันที หรือไม่

☐ 1. ไม่ทำ ☐ 2. ทำเป็นบางครั้ง ☐ 3. ทำเป็นประจำ

22. ท่านใช้อุปกรณ์ป้องกันอันตรายส่วนบุคคลขณะทำงานหรือไม่

☐ 1. ไม่ใช้ ☐ 2. ใช้เป็นบางครั้ง ☐ 3. ใช้เป็นประจำ

23. ท่านใช้อุปกรณ์ป้องกันอันตรายส่วนบุคคลประเภทใดบ้าง (เลือกได้มากกว่า 1 ข้อ)

☐ 1.ถุงมือ ☐ 2. ผ้าปิดจมูก ☐ 3. แว่นตา

☐ 4. หมวกกันน็อค ☐ 5. เข็มขัดนิรภัย ☐ 6. อื่นๆ ... (โปรดระบุ)

24. ท่านได้ตรวจสอบอุปกรณ์ เครื่องมือ เครื่องจักร หรือตรวจสภาพรถให้พร้อมสำหรับการทำงานหรือไม่

☐ 1. ไม่ได้ทำ ☐ 2. ทำเป็นบางครั้ง ☐ 3. ทำทุกครั้ง

ส่วนที่ 4 เป็นแบบสอบถามเกี่ยวกับข้อมูลสุขภาพความเจ็บป่วยทั่วไปและสาเหตุของการเจ็บป่วย

<u>คำชี้แจง</u> ให้ผู้ตอบแบบสอบถาม โปรดใส่เครื่องหมาย √ หน้าข้อที่เลือก

25. ปัจจุบันท่านมีโรคประจำตัวที่ได้รับการวินิจฉัยจากแพทย์หรือไม่

☐ 1. ไม่มี ☐ 2. มี

<u>หากระบุมีโรคประจำตัวให้ ใส่เครื่องหมาย √ ตามช่องที่กำหนดตามที่เป็นโรคและวิธีการรักษา หาก ไม่มีให้ข้ามไปตอบข้อที่ 27</u>

โรคประจำตัว (ตอบได้มากกว่า 1 โรค)	**ไม่มี**	**มี**
โรคความดันโลหิตสูง		
โรคหัวใจ		
โรคเบาหวาน		
ภูมิแพ้		
โรคหอบหืด		

26. ท่านมีวิธีการรักษาโรคประจำตัวอย่างไร (เลือกได้มากกว่า 1 ข้อ)

☐ 1. ไม่รักษา ☐ 2. ซื้อยารับประทานเอง ☐ 3. ไปอนามัย
☐ 4. ไปคลินิค ☐ 5. ไปโรงพยาบาล ☐ 6. ใช้ยาสมุนไพร
☐ 7. อื่น ๆ ..... (โปรดระบุ)

27. ใน 1 รอบปีที่ผ่านมาท่านมีปัญหาสุขภาพ/การเจ็บป่วย ที่เกิดจากการทำงานหรือไม่

☐ 1. ไม่มี ☐ 2. มี

(หากตอบ **มี** ให้เลือกสาเหตุของการเจ็บป่วย)

สาเหตุของการเจ็บป่วย (ตอบได้มากกว่า 1 สาเหตุ)	**มี**	**ไม่มี**	**อาการ/ผลกระทบต่อสุขภาพ (ตอบได้เพียง 1 ช่อง)**	
27.1 มีการสัมผัสแหล่งความร้อนหรือทำงานกลางแจ้ง			( )	ไม่มีอาการ
			( )	มีอาการหิวน้ำ เหนื่อย เหงื่อออกมาก
			( )	มีผื่นแดง คันบริเวณผิวหนัง
			( )	เป็นตะคริวบ่อยๆ
27.2 บริเวณที่ทำงานมีเสียงดังมาก(ยืนห่างกัน3 ฟุตแล้วพูดคุยปกติ ไม่ได้ยิน ต้องตะโกน)			( )	ไม่มีอาการ
			( )	รู้สึกรำคาญ หงุดหงิด
			( )	รู้สึกหูอื้อ เจ็บหู มีเสียงดังในหู

สาเหตุของการเจ็บป่วย (ตอบได้มากกว่า 1 สาเหตุ)	มี	ไม่มี	อาการ/ผลกระทบต่อสุขภาพ (ตอบได้เพียง 1 ช่อง)	
27.3 บริเวณที่ทำงานมีแสงสว่างจ้ามาก (ทำให้มีปัญหาเกี่ยวกับสายตาขณะทำงานหรือหลังเลิกงาน)			( ) ( ) ( ) ( )	ไม่มีอาการ มีอาการเมื่อยล้าดวงตา แสบตา น้ำตาไหล ตาแดง ปวดตา ปวดศีรษะเนื่องจากการใช้สายตามาก
27.4 บริเวณที่ทำงานมีแสงสว่างไม่เพียงพอ (ทำให้มีปัญหาเกี่ยวกับสายตาขณะทำงานหรือหลังเลิกงาน)			( ) ( ) ( ) ( )	ไม่มีอาการ มีอาการเมื่อยล้าดวงตา แสบตา น้ำตาไหล ตาแดง ปวดตา ปวดศีรษะเนื่องจากการใช้สายตามาก
27.5 มีการใช้หรือสัมผัสสารเคมีในขั้นตอนการทำงาน			( ) ( ) ( )	ไม่มีอาการ ผื่นคัน ระคายเคืองผิวหนังตา จมูก วิงเวียนศีรษะ คลื่นไส้อาเจียร
27.6 บริเวณที่ทำงานมีฝุ่นละออง			( ) ( ) ( ) ( )	ไม่มีอาการ มีอาการผื่นคันทางผิวหนัง ระคายเคืองทางเดินหายใจ หายใจลำบาก แน่นหน้าอก
27.7 ในการทำงานท่านต้องยกของหนักเกินไปหรือไม่ (ยกของไม่เกิน 20 กิโลกรัม สำหรับผู้หญิงอายุ 15 ปี แต่ไม่ถึง 18 ปี และไม่เกิน 25 กิโลกรัม สำหรับผู้หญิงอายุ 18 ปีขึ้นไป ยกของไม่เกิน 25 กิโลกรัม สำหรับผู้ชายอายุ 15 ปี แต่ไม่ถึง 18 ปี และไม่เกิน 50 กิโลกรัม สำหรับผู้ชายตั้งแต่ 18 ปีขึ้นไป			( ) ( ) ( ) ( )	ไม่มีอาการ มีอาการปวดเมื่อยเล็กน้อยพอทนได้ มีอาการปวดเมื่อยมากต้องรับประทานยา ต้องหยุดทำงานหรือเข้ารับการรักษาที่โรงพยาบาล
27.8 ทำงานในท่าทางที่ทำให้เกิดอาการปวดเมื่อยตามส่วนต่างๆของร่างกาย เช่น ต้องยืนเป็นเวลานานๆ การทำงานในท่าเดิมซ้ำไปซ้ำมา			( ) ( ) ( ) ( )	ไม่มีอาการ มีอาการปวดเมื่อยเล็กน้อยพอทนได้ มีอาการปวดเมื่อยมากต้องรับประทานยา ต้องหยุดทำงานหรือเข้ารับการรักษาที่โรงพยาบาล

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