ED027

Occupational Health and Safety Needs of Employee s in an Academic Institution in Baguio City

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Abstract

As the university sector in most countries becomes large with varying organizational cultures, new demands have arisen for understanding the causes and means of prevention of accidents, injuries and illnesses among employees and staff. A review of occupational health and safety studies in academic institutions revealed the scarcity of the subject in the Philippines. Thus, the researcher aimed to gather information on the hazards, risks and other relevant health factors encountered by the teaching and non-teaching employees in one of the major Universities in Baguio City, Philippines. Specifically, the objectives of this study were to identify the hazards commonly encountered by the employees associated with their work and determine the extent to which these hazards were observed. Descriptive-survey method was employed that consisted of the use of reliability tested survey and structured open ended questionnaires.

The results of the survey were validated through informal interviews, documentary analysis and field observations. The study involved 109 full time teaching and 95 non-teaching employees who volunteered to be part of the study. The results of the study provided evidence that University employees were exposed to a varied type of hazard ranging from MODERATE to HIGH level consistent with previous studies that universities have an extraordinarily varied and large number of hazards. Furthermore, the nature of work was recognized to be a significant factor contributing to the level of hazards encountered by the employees. As further implied from the result of the study, reduction of identified ergonomic, chemical and psychosocial hazards and maintenance of a safe and healthy workplace necessitates strong management commitment and strong employee participation.

Keywords: ergonomic, chemical and psychosocial hazards, non-teaching, teaching employees

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1. Introduction

Safety constitutes one of the essential human needs, as postulated by Abraham Maslow in his theory of needs Hierarchy. Feeling safe at work ranks as a very important factor in job satisfaction. In attempt to satisfy this need certain organizations incorporate into their policy thrusts, guaranteeing workers' safe work execution under a climate capable of enhancing the physical, mental, and emotional conditions (Akpan, 2011). Under work environment, Hall and Goodale (1986) describe employee health as the absence of illness or disease resulting from the interaction of employee and the work environment.

In general term, health means a state of complete physical, emotional, mental, and social ability of an individual to cope with his environment, and not merely the absence of disease or infirmity (Hippocrates, 1981). Health is the art and science of preventing disease, prolonging life, promoting physical and mental health, sanitation and personal hygiene, control of infections and organization of health services (Lucas, 2001).

On the other hand, safety means freedom from the occurrence or risk of injury or loss (Aswathappa, 2004). He described industrial or employee safety as the protection of workers from the danger of industrial accidents. Safety can as well be referred to as the absence of injuries due to the interaction of the employee and the work environment (Lucas, 2001).

Workplace Health and Safety Handbook (2006) defines hazard as something that has the potential to harm the health, safety and welfare of people at work. Hazardous things as classified by the "Introduction to hazard identification & risk assessment" (n.d.) include equipment, machinery, electricity, fuel gas, fire, noise, tools and chemicals. Hazard is also associated with the way of working at a height, in confined spaces, lifting/handling, being alone, being trained/untrained and stressful working conditions. Likelihood of harm increases with prolonged time of exposure and with lack of training.

Ergonomic hazards refer to workplace conditions that pose the risk of injury to the musculoskeletal system of the worker. Examples of musculoskeletal injuries include tennis elbow (an inflammation of a

tendon in the elbow) and carpal tunnel syndrome (a condition affecting the hand and wrist). Ergonomic hazards include repetitive and forceful movements, vibration, temperature extremes, and awkward postures that arise from improper work methods and improperly designed workstations, tools, and equipment (The University of Chicago, 2010). Ergonomic hazards are the hardest to spot since people don't always immediately notice the strain on their body or the harm that these hazards pose. Short-term exposure may result in "sore muscles" the next day or in the days following exposure, but long-term exposure can result in serious long-term illnesses (Occupational Safety and Health Administration, 2006). The handling of heavy machinery, uncomfortable ergonomic postures and probably working long hours makes the workers vulnerable to health diseases and illness. Back or neck pain, finger or toes turning white, stiffness, painful joint, numbness in hands, wrists, forearms, shoulders, knees and feet and swelling or inflammation are some illnesses that could result from mechanical/ergonomics health hazard (Eyayo, 2014).

Chemical hazard is an element or mixture of elements or synthetic substances that are considered harmful to employees. Examples include: cleaning products and solvents, vapors and fumes, carbon monoxide or other gases, gasoline or other flammable materials (Safety Training Environmental Safety Hazards, 2014). About 100,000 different chemical products are in use in modern work environments and the number is growing. Chemicals are increasingly used in virtually all types of work, including non-industrial activities such as hospital and office work, cleaning, and provision of cosmetic and beauty services. Health effects include metal poisoning, damage to the central nervous system and liver (caused by exposure to solvents), pesticide poisoning, dermal and respiratory allergies, dermatoses, cancers and reproductive disorders (Eyayo, 2014). Chemical hazards and toxic substances pose a wide range of health hazards such as irritation, sensitization, and carcinogenicity; and physical hazards such as flammability, corrosion, and reactivity (U.S. Department of Labor, 2002).

Repetitive tasks and static muscular load are common among many industrial and service occupations and can lead to injuries and musculoskeletal disorders. In many developed countries such disorders

are the main cause of both short-term and permanent work disability and lead to economic losses amounting to as much as 5% of GNP (WHO, 2013). Exposure to ergonomic hazards made up the bulk of reported occupational complaints in the Philippines, in particular occupational grievances attributable in descending order to prolonged standing up in manufacturing processes, to chemical hazard exposure and exposure to physical hazards (Occupational Safety and Health Center, 2006). From an unpublished data by HSE as cited by Venables & Allender (2006), it was reported that for 2001–2002, of the illnesses reported by higher education employees as caused or made worse by work in the United Kingdom (UK), 48% were stress, depression, or anxiety and 28% were musculoskeletal disorders.

Psychosocial hazards comprise of the psychological and social hazards. Psychosocial hazards are aspects of the work environment that are thought to have the potential to affect negatively the well-being of employees. The negative effects of psychosocial hazards are often referred to as ‘strain’. Monotonous work, work that requires constant concentration, irregular working hours, shift-work, and work carried out at risk of violence (for example, police or prison work), isolated work or excessive responsibility for human or economic concerns, can also have adverse psychological effects. Psychological stress and overload have been associated with sleep disturbances, burn-out syndromes and depression. Epidemiological evidence exists of an elevated risk of cardiovascular disorders, particularly coronary heart disease and hypertension in association with work stress (Eyayo, 2014).

Venables and Allender (2006) argued that although exposures to hazardous processes or materials in universities are much smaller in scale than in, say, manufacturing industry, universities have an extraordinarily varied and large number of hazards, some very specialized and exotic. It is likely that this variety of hazardous exposures requires a higher level of occupational health response than that needed in mono-hazard industries. This is further confirmed by a study of Emery (1997) which identified a variety of occupational hazards which are indigenous to academic and research institutions, ranging from traditional life safety concerns, such as fire safety and fall protection, to

specialized occupational hygiene issues such as exposure to carcinogenic chemicals, radiation sources, and infectious microorganisms. The results of these studies highlight that institutional health and safety programs are constantly challenged to establish and maintain adequate protective measures for this wide array of hazards.

Based on the study of Venables and Allender (2006), the main hazards and other occupational health concerns in UK universities as perceived by university occupational health service staff were allergens, chemicals/laboratories, and infection. The main other concerns reported were stress, manual handling/musculoskeletal disorders, and display screen equipment. Poor management was reported as a main concern by 13 universities. Goodwin, Cobbin and Logan (1999) surveyed all 33 Australian universities offering courses in chemistry and found that occupational health and safety training for students and staff was variable in amount and content and was frequently not assessed along with other coursework. Rombeck and Schacke (2000) identified 13,764 different chemical substances in their survey of 11 German medical university institutes. Although most institutions were attempting to comply with the recent regulations, the authors identified a lack of listing of chemicals and of internal policies and guidance for workers, a need for substitution of carcinogenic and toxic chemicals with less toxic alternatives, and a complete lack of occupational health surveillance.

The importance of occupational health is often overlooked and people tend to equate occupational illness with industrialization and huge factories in urban areas. This narrow view hampered the development of occupational health in developing countries. While at work, people face a variety of hazards almost as numerous as the different types of work, including chemicals, biological agents and adverse ergonomic conditions etc. Globally, there are 2.9 billion workers who are exposed to hazardous risks at their work places. Annually there are two million deaths that are attributable to occupational diseases and injuries while 4% of Gross Domestic Product is lost due to occupational diseases and injuries (Meswani, 2008).

Venables and Allender (2006) commented that despite the risk and complexity of the hazards identified in

universities, little has been written about the occupational health needs of this employment sector. By “needs” is meant not only information about hazard and risk, but also other information relevant to planning occupational health provision in universities.

International Labor Organization defines Occupational Safety and Health (OSH) as the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; it calls for the prevention of any impairment in the health and well-being of workers caused by their working conditions or work environment (International Labour Organization [ILO], n.d.). ILO reports that occupational health issues are often given less attention than occupational safety issues because the former are generally more difficult to confront. However, when health is addressed, so is safety, because a healthy workplace is by definition also a safe workplace.

It was with the abovementioned premise that the researcher aimed to gather information on the hazards, risks and other relevant health factors encountered by the faculty and employees of the University of Baguio (UB). Specifically, the objectives of this study were to 1) determine the level of ergonomic, chemical and psychosocial hazards encountered by the non-teaching and teaching employees and 2) compare the level of hazards in terms of the nature of work.

2. Methodology

Research Design

Descriptive-survey method was employed in this study that consisted of the use of survey and structured open ended questionnaires, documentary analysis and field observations.

The Sample

This study involved all full time teaching and non-teaching employees of the University during the second semester School year 2014-2015. The length of service among 109 teaching employees who participated in the study ranged from one semester to 26 years and the teaching hours ranged from 18 hours to 48 hours a week. Among the teaching employees 85(78%) eat, 79(72%) drink water and other beverages, 3(3%) smoke and 39(36%) apply make up in their work area. Among the 95 respondents

from the non-teaching personnel, the length of service ranged from 3 months to 34 years and they worked an average of 48 hours a week. Among the 95 respondents 86(91%) eat, 67(71%) drink water and other beverages, 0(0%) smoke and 25(26%) apply make up in their work area.

Survey Questionnaires

Part I of the questionnaire was a demographic survey to gather information on workplace characteristics, length of service in the University, position, nature of work and subject taught, if teaching. Parts II to IV of the survey questionnaire were adapted from the Workplace Health and Safety Handbook (2006). Minor revisions were made in the checklist to suit the needs and context of the University. The researcher modified the choices of "yes", "no", or "n/a" and changed them to a four-point Likert scale for the respondents to indicate their responses ranging from 4 for always observed to 1 for never observed. Such modifications were done to identify potential hazards and at the same time to assess the level of hazards. The following interpretations were based on the Occupational health and safety management systems - Guide: British Standard, BS 8800, BSI 2004; and Managing Safety the Systems Way: Implementing OHSAS 18001 using BS 8800, BSI 2004.

1 – **Never Observed** (Not or with less than 1% chance of being observed/experienced by an individual during their working lifetime)

2 – **Sometimes Observed** (Typically observed/experienced once during the working lifetime of an individual)

3 – **Frequently Observed** (Typically observed/experienced once every five years by an individual)

4 – **Always Observed** (Typically observed/experienced at least once every six months by an individual)

Open ended questions were also included in the abovementioned questionnaires (Part V) to determine as to how much, how often and for how long employees were exposed to the different hazards. Questions like having a pet cat at home, having work outside the regular job which involves exposure to chemicals and any hobbies which involve exposure to chemicals and other stressors, were also included to determine other factors which contributed to the exposure of the respondents to biological and chemical hazards in addition to those found in the University. Part VI of the questionnaire was

adapted from the study of Drozdowsky and Whittaker (1999). This part of the questionnaire was only answered by employees who used chemicals at work or may be exposed to other hazardous conditions. Since Parts II to IV of the survey questionnaire were adapted from the Workplace Health and Safety Handbook (2006) validity was not anymore established. To establish reliability, the said questionnaire was tried out in of the Universities near the locale of the study. The summary of the reliability test result is shown in Table 1.

Table 1

Summary of the Reliability Test Results

Areas Associated with Ergonomic Hazards			
Indicators	**No. of items**	**Cronbach Alpha**	**Interpretation**
Job Design	2	0.900	Excellent Reliability
Manual Handling	4	0.848	Very Good Reliability
Workstation	12	0.937	Excellent Reliability
Storage/Cabinets/Lockers	4	0.961	Excellent Reliability
VDU's	3	0.835	Very Good Reliability
Areas Associated with Chemical Hazards			
Indicators	**No. of items**	**Cronbach Alpha**	**Interpretation**
Hazardous Substances	4	0.828	Very Good Reliability

Data Collection Procedure

Parts II to IV of the questionnaire were utilized to determine the level of exposure of the University employees to ergonomic and chemical hazards. Responses to the open ended questions (Part V) were analyzed to further validate the responses of the employees from Parts II to IV of the questionnaire. The responses were classified according to their association to chemical, psychosocial and ergonomic hazards.

Prior to the conduct of the survey, permission through a letter was sought from the Director of the Research and Development Center and the Vice President (VP) for Academic Affairs of the University. Copies of the approval letter were sent to the different School Deans, Principals and Heads of Offices together with

the survey questionnaires and consent forms. Employees were asked to sign a consent form which included the objectives of the study. This was to ensure that the participants fully understood why they were asked to participate in the study and that participation was voluntary. All participants were assured that all the information gathered in the study will be held in strict confidentiality. The participants were informed of their rights as indicated in the consent form. These rights include but are not limited to the participants' right to: be informed of the nature and purpose of the study; be given an explanation of the procedures to be followed in the study, and device to be utilized; be given a description of any foreseeable risk, pain or discomfort, or inconvenience to the individual (or others) be given an explanation of any benefits to the subject reasonably to be expected, if applicable; be given an opportunity to ask questions concerning the study or the procedures involved; be free to refuse to participate or withdraw from the research at any time without penalty or loss of benefits to which he/she is entitled; be given a copy of the signed and dated consent form; and be given the opportunity to decide to consent or not to consent to a study without the intervention of any element of force, fraud, deceit, duress, coercion or undue influence on the subject's decision (Philippine National Health Research System, 2011).

Statistical Treatment

Weighted means were computed from the responses of the employees to Parts II to IV of the survey questionnaire. Weighted means were used to determine the degree by which the hazards are observed or encountered by the employees, and were interpreted as follows:

3.25 – 4.0 – Very High Degree/ Always observed

2.50 – 3.24 – High Degree/ Frequently observed

1.75 – 2.49 – Moderate Degree/ Sometimes observed

1.00 – 1.74 – Low Degree/ Never observed

t-test was used to determine if there are significant differences in the level of exposure to chemical and ergonomic hazards between non-teaching and teaching employees.

3. Results and Discussion

A. Ergonomic Hazards

Job De sign

Results showed that teaching and non-teaching employees were exposed to a HIGH degree of ergonomic hazard attributed to the tasks performed which require constant sitting or standing for more than 2 hours and high level of concentration performed for more than 2 hours at any one time. t-test revealed, as shown in Table 2, that there was no significant difference between the groups, although the non-teaching employees obtained a higher mean rating. Sitting for more than 1 hour has been shown to induce biochemical changes in lipoprotein lipase activity (an enzyme involved in fat metabolism) and in glucose metabolism that leads to the deposit of fats in adipose tissue rather than these being metabolized by muscle, and extensive sitting also relates to heart disease risks. Recent studies have indicated a possible increase in the risks of coronary heart disease and kidney disease from excessive sitting. However, the data are correlational and what is unclear from these studies is whether it is sitting that causes these health problems or whether because people have these health problems they sit more than do healthy people. Sitting uses less energy than standing and it helps to stabilize the body. However, for many years ergonomists have recommended that sitting is broken up by periodic standing and moving during the day, preferably 1-2 minutes every 20 to 30 minutes. A large body of research has shown that frequent micro-breaks improves levels of comfort, work performance, and reduces the risks of musculoskeletal injuries (Cornell University Ergonomics Web, n.d.).

Open ended questions revealed that most office workers spent several hours a day infront of Display Screen Equipment (DSE) than teaching employees, thus posing a higher degree of ergonomic hazard. Whether browsing the web or intensively entering and editing text in a document, arms, wrists, and fingers are at work on the keyboard, mouse, and desktop. These continuous movements cause Repetitive Strain Injury (Sonal & Nisreen, 2012). Reports of studies have suggested clearly the likelihood of staff suffering health problems linked to computer use is related to the amount of time spent using them and also lack of knowledge related to computer ergonomics. Eye and vision problems have been reported; in fact, eye and vision complaints are the most common complaints of computer users (Suparna, Sharma & Kandekar, 2005).

Table 2

Comparison of the Mean level of Ergonomic Hazard Associated with Job Design

Employee	N	Mean	Descriptive Interpretation	SD	t-value	Significance level (2-tailed)
Non-Teaching	93	3.16	High	0.63	0.816	.415*
Teaching	107	3.07	High	0.78		

*not significant p > 0.05

Over the past decade, observational studies have demonstrated that total time spent sedentary, and the manner in which sedentary time is accumulated, is detrimentally associated with several health outcomes including elevated markers of cardio-metabolic risk, type 2 diabetes, obesity, cardiovascular disease, breast and colon cancer and premature mortality. These adverse health relationships, coupled with the high proportion of the waking day spent in this behavior, have prompted calls for interventions to specifically target a reduction in sitting time, with a particular focus on high-risk settings such as the office workplace (Dunstan, Wiesner, Eakin, Neuhaus, Owen, LaMontagne, Moodie, Winkler, Fjeldsoe, Lawler, and Healy, 2013).

Manual Handling

Table 3 shows that non-teaching employees were exposed to a higher level of ergonomic hazard associated with manual handling than teaching employees. Despite the mean levels interpreted as MODERATE degree, t-test proved that there was a significant difference in the level of exposure between the two groups. Manual handling means the use of one's body to exert force to handle, support or restrain any object, and includes not only lifting and carrying but also repetitive tasks. A manual handling task that has the potential to cause injury is a "hazardous manual handling task". Manual handling includes computer use and workstation ergonomics (Deakin University Australia Worldly, 2015). According to the Health and Safety Executive (n.d.), manual handling is one of the most common causes of injury at work and causes over a third of all workplace injuries which include work related Musculoskeletal Disorders (MSDs) such as upper and lower limb

pain/disorders, joint and repetitive strain injuries of various.

One item of the survey questionnaire underscores that compared to teaching employees, non-teaching employees perform more frequently pushing, pulling, lifting, lowering, carrying, holding or moving objects which require considerable physical effort or force to complete. As shared from the open ended questions, these activities were performed on the average of one hour a day, and involved among others, documents and supplies at the offices, patients at the Medical Clinic, laboratory equipment and materials at the laboratory supply rooms, and computer devices at the MIS department. From the 17 teaching employees who answered the open ended question on "lifting" activities, 10(59%) revealed that their activities involved lifting of LCD projectors and laptops to and from the classrooms and 7(41%) involved lifting of other instructional materials like books, hand-outs and laboratory manuals.

Table 3

Comparison of the Mean level of Ergonomic Hazard Associated with Manual Handling

Employee	N	Mean	Descriptive Interpretation	SD	t-value	Significance level (2-tailed)
Non-Teaching	95	2.29	Moderate	0.76		
Teaching	109	2.06	Moderate	0.77	2.138	.034*

*significant $p < 0.05$

The effect of the aforementioned activities of the employees can be linked to the result of the study of Fernandez and Mallillin (2015) wherein 80 non-teaching and teaching employees and general services personnel underwent postural assessment activities on August 2013 at the University Physical Therapy clinic. Sixty nine (69) % of the employees manifest postural faults suggesting unequal shoulders. Shoulder asymmetries may be caused by repetitive overhead activities such as writing on the board as observed with teaching staff, constant use of

dominant hand strenuous activities such as cleaning, electrical works or carrying loads among the general services staff, and higher shoulder position due to desk height as may be observed with non-teaching employee participants performing clerical works.

The result of the survey echoes results of other studies that aside from physical hazards, University personnel are also exposed to ergonomic hazards. According to one nationwide study conducted in Taiwan, 54% of workers reported exposure to ergonomic hazards. Ergonomic factors related to occupational injuries included whole body vibration, repetitive hand stress, frequent use of heavy tools, and lifting and carrying heavy objects (Liang, Kuo, Wang, & Chen, 2002)

Workstations/offices/classrooms/laboratory rooms

Table 4 shows that both non-teaching and teaching employees were exposed to a MODERATE degree of ergonomic hazard associated with the design and facilities at the work areas. t-test proved that there was a significant difference in the mean level with the teaching employees exposed to higher level of ergonomic hazard. The results of the survey reflected that the design of the work areas were frequently adequate and accessibility of materials were frequently suitable for the tasks to be performed by the non-teaching and teaching employees. Thus, both groups were only exposed to a MODERATE degree of ergonomic hazard. It was also revealed that non-teaching employees were more frequently provided with adjustable chairs than teaching employees. It must be noted that when not in the classroom or laboratory rooms, teaching employees also spent considerable amount of time seated checking quiz and exam papers and preparing instructional materials, as shared from the open ended questions. Timoteo-Afinidad (2010) pointed out that chairs which are not adjustable in height and backrest angle from the seated position may result in discomforts in the forearms, wrists and hands of the workers. As emphasized by Joyce and Wallersteiner (1989), ergonomic considerations in designing workspaces is important since they are an integral tool that ought to “establish relationships not only between people but also between people and equipment”. A study by the UK Health & Safety Executive (2006) which investigated the root causes behind 126 manual handling injuries in the UK sector of the North Sea concluded that in 23% of the

cases, the root cause was due to either poor workplace design or poor equipment design. A further 9% were due to workers using the wrong equipment for the job (usually because the correct equipment was not readily available). Most of these can probably be considered to be due to genuinely ergonomic hazards in the workplace.

The survey also points out the need to conduct trainings for employees to heighten awareness on ergonomic hazards. This can be justified by an evaluation of an office ergonomics training program in one American university by means of a one year follow up of a sample of 200 program participants. The said training program have found to have changed behavior in 95% of respondents and increased postural awareness in 86% (Venables & Allender, 2006).

Table 4

Comparison of the Mean level of Ergonomic Hazard Associated with Workstations or Offices

Employee	N	Mean	Descriptive Interpretation	SD	t-value	Significance level (2-tailed)
Non-Teaching	95	2.01	Moderate	0.54	-2.868	.005*
Teaching	109	2.24	Moderate	0.63		

*significant $p < 0.05$

Storage Rooms

Table 5 reveals that non-teaching and teaching employees were exposed to a MODERATE degree of ergonomic hazard associated with the design and adequacy of the storage spaces in the work areas. This implies that in general, both group of employees were frequently (but not always) provided with sufficient storage which were also designed for a safe and easy access by the employees. This result can be linked to proper housekeeping. As emphasized by the Canadian Center for Occupational Health and Safety (2014), effective housekeeping is not just cleanliness. It also requires paying attention to important details such as the layout of the whole workplace, aisle marking, the

adequacy of storage facilities, and maintenance. In the University there is no written policy which guides Schools and offices on the uniform implementation of effective housekeeping. Thus, Schools and offices have different housekeeping practices.

Table 5

Comparison of the Mean level of Ergonomic Hazard associated with Storage Room

Employee	N	Mean	Descriptive Interpretation	SD	t-value	Significance level (2-tailed)
Non-Teaching	95	2.17	Moderate	0.77		
Teaching	109	2.41	Moderate	0.80	-2.175	.031*

*significant $p < 0.05$

Despite a moderate degree of hazard by both group of employees, t-test shows that there was a significant difference in the mean level with the teaching employees showing a higher mean. One implication would be that the work areas for non-teaching employees were provided with more storage spaces than faculty rooms, classrooms and laboratory rooms. Based on the Occupational Safety and Health (OSH) officers' inspection in 2013 and as observed by the current researchers, there were unorganized faculty rooms in the University with scattered papers attributed to the insufficient storage facilities. Scattered papers may also pose threat as fire hazard. Despite the provision of lockers and cabinets in most faculty rooms in the University, some were located below mid-thigh height or above shoulder height which posed an ergonomic hazard to the teaching employees.

Visual Display Units (VDU's)

There has been a rapid and continuing growth in the use of computers in all sections of industry and commerce. Different terminology is used – for example, visual display units (VDUs), visual display terminals (VDTs), monitors and display screen equipment (DSE) (Trade Union Congress, 2015). Table 6 shows that teaching and non-teaching employees were exposed to a moderate degree of ergonomic hazard associated with the use of VDU's. But t-test

proved that there was a significant difference between the two groups with the teaching employees garnering a higher mean. Quite notable from the result of the survey was that teaching employees were not always provided with keyboard rest that frees up desk space for other tasks which exposed the group to a high degree of ergonomic hazard.

Another factor contributing to the ergonomic hazard was the adjustability of the screen height of the VDU's used. According to the Trade Union Congress (2015), an important factor in workstation design is adjustability. Adjustment is important both because people of different shapes and sizes use VDU's/DSE and because different VDU's/DSE is used for different jobs. The workers concerned must also to know how to carry out the adjustment so as to optimize the layout of the workstation. The adjustments should be easy to make and it should be possible to make the most common adjustments from the working position.

Table 6

Comparison of the Mean level of Ergonomic Hazard associated with Visual Display Units (VDU)

Employee	N	Mean	Descriptive Interpretation	SD	t-value	Significance level (2-tailed)
Non-Teaching	93	2.10	Moderate	0.66		
Teaching	105	2.42	Moderate	0.81	-3.047	.003*

*significant $p < 0.05$

As observed by the researchers, aside from desk top computers many teaching employees made use of portable or laptop computers in their work place. The prolonged use of laptop computers posed an ergonomic hazard for several reasons. The compact design of laptops, which were never designed for prolonged use, means that the screen and keyboard are fixed and cannot be adjusted separately. The screen is small and can be difficult to read. The keyboard is cramped. Laptops are often, by necessity, used at inappropriate workstations leading to a cramped working

position. Thus, it must be noted that prolonged use of portable equipment that is habitually used by a DSE user for a significant part of his/her normal work is covered by the DSE Regulations. The regulation recommends workers should avoid using a portable computer on its own if full-sized equipment is available. If a full-sized alternative is not available, a docking station should be used, with extension keyboard and pointing devices available. Over recent years many employers have made increasing use of laptop computers and many workers have little choice but to use them as a substantial part of their normal work routine (Trade Union Congress, 2015).

Repetitive strain injuries (RSI) are a major problem for users of DSE. RSI is the collective name used to describe a range of muscle and tendon conditions of the neck, shoulders, elbows, wrists, hands and fingers caused by continuous, repetitive or pressurized finger, hand or arm movements such as typing. Other names used to describe these conditions include WRULDs (work-related upper limb disorders), Occupational Overuse Syndrome, and Cumulative Trauma Disorders. Symptoms include: pain in the fingers, wrists, arms or shoulders, tenderness, feeling of heaviness in the arms/wrists, swelling, tingling sensation at the fingertips, numbness and joint restriction. In addition, using a computer mouse concentrates activity on one hand and arm, and one or two fingers. This makes aches and pains in the fingers, hands, wrists, arms and shoulders more likely (Trade Union Congress, 2015).

B. Chemical Hazards

Table 7 shows that teaching and non-teaching employees were exposed to a moderate degree of chemical hazard associated with the handling of hazardous substances. From the survey questionnaire, these hazardous substances involve paints, glues, fumes in the air, dust smoke and chemicals which are toxic, corrosive, inflammable and explosive in nature. t-test revealed that there was no significant difference between the two groups along this area.

Table 7

Comparison of the Mean level of Chemical Hazard Associated with Hazardous Substances using t-test

Employee	N	Mean	Descriptive Interpretation	SD	t-value	Significance level (2-tailed)
Non-Teaching	89	2.03	Moderate	0.76		
Teaching	104	2.16	Moderate	0.80	-1.165	.246*

*not significant p > 0.05

Responses from the open ended questions revealed that teaching employees who were most exposed to chemical hazards were those handling General Science and Allied Medical Science courses. The chemicals handled involved corrosive, flammable, toxic and carcinogenic materials. Corrosive chemicals cause burns if it comes into contact with the skin and they include strong acids and bases. Flammable substances handled include alcohols which can easily catch fire. Toxic materials are substances that may cause harm to an individual if it enters the body. Toxic materials may enter the body in different ways. These ways are called the route of exposure. The most common route of exposure is through inhalation (breathing it into the lungs). Another common route of entry is through skin contact (Canadian Center for Occupational Health and Safety, 2014). Toxic chemicals handled by the identified employees ranged from inorganic to organic substances. Carcinogenic materials were also handled by some employees which include benzene containing compounds.

On the other hand, the non-teaching employees frequently exposed to chemical hazards were the science laboratory custodians mostly assigned at the Central Supply Room (CSR), Management Information System (MIS) department personnel and Medical Clinic staff. Science laboratory custodians were exposed to chemical hazards during preparation of materials and reagents needed for general science and allied medical science laboratory courses. Medical clinic personnel on the other hand used approximately a

gallon of Lysol a month for soaking surgical instruments and to disinfect the area. The potential short term health effects of Lysol are irreversible eye damage, causes skin burns and if swallowed, it target organs and respiratory system. If ingested or inhaled, signs and symptoms may include headache, dizziness, tiredness, nausea and vomiting. Thus, it is recommended by the manufacturers that users must wear protective eyewear like goggles, face shield or safety glasses, protective clothing and protective gloves, either rubber or chemical resistant (Material Safety Data Sheet, 2010). Management Information System personnel were exposed to chemical hazard every time they used contact cleaners to clean parts of the computer. Contact cleaners may cause eye redness or pain, mild to moderate skin irritation, when inhaled, may cause nose, throat and lung irritation. Overexposure may lead to visual impairment and central nervous system effects such as dizziness, drowsiness, or weakness. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis (MG Chemicals, n.d.). The laboratory custodian at the Electronics and Communication Engineering (ECE)/Physics laboratory was exposed to chemical hazard due to the use of soldering lead and strong acids by the ECE students. It was also observed by the non-teaching respondents that student assistants and general services staff were also exposed to chemical hazards in the form of cleaning agents and floor waxes. The use of floor waxes was one of the causes of headaches of some non-teaching personnel as also shared from the open ended questions.

The result of the survey denotes that University employees who are working with any hazardous agent must know how to safely work in order to protect their health, and use good procedures at all times to minimize their potential exposures to hazardous agents. This entails the use of proper and appropriate Personal Protective Equipment (PPE). Whilst it was observed that masks, laboratory gowns, googles and gloves were provided by the CSR to science laboratory and allied medical science courses teachers and students, other employees in the University exposed to the chemical hazards were not appropriately provided with such. Concerned employees' awareness on the use of proper and appropriate PPE needs to be heightened and elevated and good PPE compliance must be imposed at all times in the

University. Whilst the CSR has a compiled Material Safety Data Sheet (MSDS) for the substances in the area, as observed by the researchers the MSDSs were not consulted and reviewed periodically by employees handling hazardous chemicals. It is noteworthy to mention though that proper and appropriate labeling of hazardous substances based on the group hazard and risk they pose were already done by the CSR. In 2013, OSH officers recommended that laboratory custodians and student assistants must be well versed with the various hazard labels, hazard ratings and hazard identification. Based on the result of this study, the said recommendation must also be true for other employees in the University handling hazardous chemicals. This will help protect themselves, manage and handle the substances properly.

C. Psychosocial Hazards

In this study, the analysis of the psychosocial hazards encountered by the employees was established based on the responses from the open ended questionnaire. The method is guided by the study of Rick, Briner, Daniels, Perryman and Guppy (2001) that self-report measures are by far the most common type of psychosocial hazard measurement. They are also important as they are based on the widespread assumption within the stress literature that it is the employees' perception of psychosocial hazards that plays the key role in producing strain. In other words, whether or not any potential psychosocial hazard actually impacts on employee's well-being depends to a large extent on the way in which employees perceive that psychosocial hazard

Teaching employees who answered the questionnaire on psychological stress revealed that in a year they experienced stress in a range of "sometimes" to "always" and the causes of stress were: meeting deadlines, performing different tasks, moderate to severe paper works, conflict between responsibilities at school and at home, congested classrooms, students, stairs clogged by students, too many preparations in terms of subjects taught, stressful work environment, too much work, demands from superiors and even pollution. For the non-teaching employees their stress were caused mostly by their dealing with clients, like graduate students who were sometimes too bossy and demanding and students making use of

the library facilities who challenged the patience of the library staff. Other factors were related to the nature of the work like the conduct of student counselling at the Center for Counselling and Student Development which is done daily, interviews with students who had problems in school and family and organizing events for students by the Office of the Student Affairs personnel. Non-teaching staff at the athletics office also complained of congested office wherein other coaches didn't even have tables to work on.

The aforementioned findings are parallel to the result of the study of Thomson (2006) as cited in Imtiaz and Ahmad (2009) wherein employees in the following ratios reported that their job is a source of large amount of stress they experienced, 33%, and 77% articulated that they remain always or sometimes in stress during last 12 months, 23% reported that they rarely experienced stress during their job. Many workers express that their job is a prominent source of stress in their life but reduced workload, improve management and supervision, better pay, benefits, and vacation times can reduce the stress among employees.

Another related study would be a survey conducted among university staff in the UK in recent years and has been the subject of two monographs (Fisher, 1994; Kinman & Jones, 2004). One reported a survey carried out by the Association of University Teachers (Kinman & Jones, 2004) which found that 69% of academic and related staff found their job stressful and 50% reported psychological distress. A major study carried out by Tytherleigh, Webb, Cooper, and Ricket (2005) in 14 higher education institutions in the UK showed that the most significant source of stress was job insecurity. In comparison to normative data, staff also reported significantly higher levels of stress relating to work relationships, control, and resources and communication, and significantly lower levels of commitment both from and to their organization. However, they also reported significantly lower levels of stress relating to work/life balance, overload, and job overall, and lower levels of physical ill health.

Work overload and meeting deadline as sources of stress as revealed by the employees in this study can be affirmed by the study Babak, Shabbir and Niaz (2010) that time pressure to complete too much work in a short span of time is big source of

stress which decrease the performance of employees. With excessive pressures and job demands cannot be met, relaxation turns to exhaustion and a sense of satisfaction is replaced with the feelings of stress, and the workers start losing interest in the work and hence performance chart shows a negative trend.

Another source of stress as also revealed from the survey was the conflict between responsibilities at school and at home. Muhammad, Khalid, Nadeem and Muhammad (2011) suggested that job related stress can be mostly immobilizing because of its possible threats to family functioning and individual performance. Job related stress can create a difference between demands on families and the ability of families to provide material security for them. And that inability to maintain a reasonable balance between family life and work life results in work to family conflict which in turn cause stress and ultimately decreases the employee performance. According to Anderson, Coffey & Byerly (2002) work to family conflicts is also a predecessor which creates stress in employees of an organization.

4. Conclusions and Recommendations

The study provides evidence that University of Baguio employees were exposed to a varied type of hazard ranging from MODERATE to HIGH level consistent with previous studies that universities have an extraordinarily varied and large number of hazards. Furthermore, the nature of work was recognized to be a significant factor contributing to the level of hazards encountered by the employees. As further implied from the result of this study, reduction of identified ergonomic, chemical and psychosocial hazards and maintenance of a safe and healthy workplace necessitates strong management commitment and strong employee participation.

Based on the results of the study, the following are recommended by the researchers:

a) To minimize ergonomic hazards due to constant sitting or standing employees must be trained to perform postural transitions at least every 20–30 minutes. For many years ergonomists have recommended that sitting is broken up by periodic standing and moving during the day, preferably 1-2 minutes every 20 to 30

minutes. A large body of research has shown that frequent micro-breaks improves levels of comfort, work performance, and reduces the risks of musculoskeletal injuries.

b) The University must establish and implement programs in reducing workers' exposure to different hazards and preventing occupational illness. Specific programs may include trainings on housekeeping, chemical handling and ergonomics, as well as seminars on stress and time management.

c) The limitations of this study suggest further researches to investigate the effect of the identified hazard to the health of the employees.

d) The results of this study shall be disseminated to the respondents through a public lecture or seminar to be organized by the Research and Development Center of the University. Names of the participants shall not be mentioned during the presentation of results only generalization and recommendations shall be known.

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