

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE ON USING OF PERSONAL PROTECTIVE EQUIPMENT IN RATTAN CRAFTSMEN AT TRADE VILLAGE, KIENXUONG DISTRICT, THAIBINH PROVINCE, VIETNAM

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ABSTRACT: The knowledge, attitude and practice on using personal protective equipment (PPE) of rattan craftsmen to protect themselves from health effect related to sulfur dioxide exposure in Thuong Hien trade village at Kienxuong district, Thaibinh province, Vietnam was conducted using cross-sectional analytic study. The rattan craftsmen (n=403) were interviewed by face to face questionnaire. The results indicated that the level of good knowledge and good attitude was low equal 3.72% and 4.22% respectively. The prevalence of using respirator (face mask) was only 29.00 %. The intervention tools, therefore, should be developed for enhancing the knowledge and attitude while the training for using of respirator and other PPEs should be continuously offered for rattan craftsmen workers.

Keywords: knowledge attitude practice (KAP), personal protective equipment (PPE), sulfur dioxide (SO₂), rattan craftsmen

INTRODUCTION: Craftsmen, working with rattan sulfur-bleaching process in household rattan industry have directly exposed to sulfur dioxide causing several adverse health problems. The primary health effect of SO₂ is irritation to the eyes, skin, and upper respiratory tract. The irritation occurs when SO₂ contacts the moist mucous membranes and forms sulfurous acid^{1,2}. This irritation also serves as a warning to the individual to leave the area of exposure. Approximately 90% of all the SO₂ inhaled is absorbed in the upper respiratory tract. The SO₂ is metabolized in the body to sulfates which are eliminated in the urine³. Besides, the symptoms of higher concentrations of SO₂ exposure may include a runny nose, chest tightness, and a choking sensation. Lower respiratory symptoms, such as cough, may occur due to SO₂-induced bronchoconstriction². In human odor, the level of SO₂ is detected about 0.5 parts per million of air (ppm). Absorption of sulfur dioxide in the mucous membranes of the nose and upper respiratory tract occurs as a result of its solubility in aqueous media: 1 volume of water dissolves 45 volumes of sulfur dioxide at 15°C. Absorption is concentration-dependent, with 85% absorption in the nose at 4-6 µg/m and

about 99% at 46 µg/m⁴) pointed out that at common ambient concentrations of sulfur dioxide, absorption in the upper airways may be inefficient. Workplace controls are better than personal protective equipment. However, for some jobs such as rattan sulfur-bleaching process, personal protective equipment may be appropriate. The aim of this study was to assess the level of knowledge, attitude and practice on using personal protective equipment such as respirator (face mask), hand and arm protection, eye protector, foot protection, and clothing of rattan craftsmen to protect them from health effect of sulfur dioxide.

MATERIALS AND METHODS: Using Cross-sectional analytic study, 403 rattan craftsmen from a trade village in Kienxuong district, Thaibinh province, Vietnam were interviewed by face to face questionnaire. The results were analyzed by using SPSS (version 16) software. Descriptive statistics such as frequency, percentage, mean and standard deviation were used primarily to summarize and describe the data to make it more graspable. The ethical consideration was approved by the member of Thaibinh Medical University, Vietnam (Proof number 1/2009).

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RESULTS: Four hundred and three participants (n=403, 96%) were consented to complete the face to face questionnaires. The majority of the participants were male (59.8%). The age ranged from 20 to 70 years. The average age of the participants was 43 years with a standard deviation of 10.7. Most of them were educated in secondary school (66.8%), in contrast, only (1.2%) of respondents had no school or literacy classes only. Most of them have annual family income (80.9%) of less than 1,000,000 VND (57 USD) per month. Regarding knowledge, participants answered a total of 16 questions. Each correct answer was given one point with a total of 16 points. The average knowledge score from the respondents was 7.2 (SD=3.2) out of possible 16 points. The knowledge score was in the range of 0 – 16. While, only 5 respondents were able to answer all the questions correctly. The distribution of the knowledge on using PPE of the respondents showed that 78.2% of subjects had “Low knowledge”, 18.1% of them had “Moderate knowledge” while only 3.7% of the respondents had “High knowledge” as shown in table 1.

Table 1 Distribution of knowledge level on using personal protective equipment

| Knowledge level | Number (n=403) | Percentage (%) |
|------------------------|-------------------|-------------------|
| High (13-16 scores) | 15 | 3.7 |
| Moderate (10-12 score) | 73 | 18.1 |
| Low (0-9 score) | 315 | 78.2 |

Regarding attitude towards using PPE, Participants answered a total of 10 questions with the total score of 40. The distribution of attitudes on using PPE of respondents were shown in table 2, there were (4.2%) of respondents who had “positive attitude”, (69.0%) of them had “neutral attitude”, while 26.8% had “negative attitude”. The average attitude score for all respondents were 25.8 (SD=3.4) out of a possible 40 points.

Practice about using PPE: Respondents were allowed to select more than one type of PPE that they had used to protect themselves in rattan bleaching process. Among 29% of respondents using at least one kind of PPE, 100%

Table 2 Distribution of attitude levels towards using PPE of the respondents

| Level of attitude | Number (n=403) | Percentage (%) |
|-------------------------|-------------------|-------------------|
| Positive (32-40 scores) | 17 | 4.2 |
| Neutral (24-31 scores) | 278 | 69.0 |
| Negative (00-23 scores) | 108 | 26.8 |

of them had absolutely used respirator, while 27.4% used hand and arm protection, 11.1% used Eye protector, only 2.6% of them used foot protection and 1.7% of them used clothing. Respondents had fair level of practice more than good level of practice (53.0% compare to 47.0% with respirator; 56.2% compare to 43.8% with hand and arm protection). None of the respondents had poor practice.

DISCUSSION: As it is generally accepted that there is significantly accepted difference in the gender in occupations⁵). Similarly, the results showed male predominance with 59.8 % compared with 40.2% of a report working on textile industry. The reason for this difference is that rattan sulfur - bleaching process is a hard and poisonous work that requires much of time (18 hours each time on average) and strength so men usually account for this risk work. Other different studies showed that the working group in cottage industries is in the range of 25 to 40 years⁵⁻⁷). Our study also revealed an average age of 43 years of rattan craftsmen which may lead to the fact that the workers had a longer exposure directly to toxic pollutant from sulfur-burning gas. Regarding education, in this study, most of the rattan craftsmen (66.8%) had secondary education. This is because of the fact that producing rattan products is the main work of people in the village. Besides, nearly all members of families take part in different stages of producing rattan handicrafts from buying fresh rattan from other provinces of harvesting from the field, bleaching rattan, splitting rattans into small scales to weaving to make rattan handicrafts. Of which, main workers in each family are responsible for buying fresh rattan, bleaching and selling final products whereas other members are responsible for

splitting rattans into small scales. These works took much time of main workers in each family so it explained why a big number of main workers in the study only had secondary education. Moreover, due to the fact that producing rattan products require scrupulousness and consume much time, so members of the village did not have time for higher education.

Sulfur is known to be one of the chemicals that have the most adverse harmful effects on the workers of the industry. There are many ways for the workers to protect themselves from the harmful effects of these chemicals. One of the important ways to protect the workers from the gas of burning sulfur is the use of PPE. According to the knowledge on using PPE in rattan bleaching process, a study on KAP regarding organic solvents among printing workers in Hong Kong⁸⁾ reported that the workers in the printing industry in which many chemicals are used had a good knowledge (62.0%) about the harmful effects of the chemicals in printing which was excellent and 91.6% respondents knew that chemicals used in the industry have harmful effects to their health. These may because of the fact that Hong Kong is a developed country that allows all its citizens to enjoy a free and healthy life in a safe environment (General Kofi Annan, http://www.nescap.org/unis/press/G_05_00.htm); so the workers have higher education and they also can easier to obtain the proper information on KAP via several mass media while most Vietnamese workers were opposite. However, Attia⁶⁾ reported that workers in this industry had small knowledge about PPE. This is similar to the number in this study that majority (78.2%) of workers have low level of knowledge on using PPE to protect themselves from poisonous gas from burning sulfur.

Regarding attitude on using PPE, a study of Yassin, Abu Mourad, and Safi⁷⁾ assessed the attitude regarding the use of harmful chemicals for workers in small industries. According to their study, 59.3% were against the use of chemicals which have harmful effects while the

present study, this number is 26.8% and majority (69.0%) remained neutral.

The use of PPEs are different depending on type of industries; a survey on usage of PPE in Hong Kong⁹⁾ revealed that less than 50% of renovation workers interviewed were using PPE such as safety helmets (33.6%), safety goggles (37.6%), safety belts (25.6%), safety gloves (45.0%), safety shoes (20.1%), ear plugs (21.3%) and face mask (11.2%). Not more than 10% of the workers had used protective clothing (9.2%) or apron (2.8%). In our study, 29.0% of respondents have ever used at least one kind of PPE (absolutely using respirator), while 27.4% used hand and arm protection, 11.1% used Eye protector, only 2.6% and 1.7% of them used foot protection and clothing, respectively. There were many reasons observed why not to use PPE, the majority of craftsmen in this study was not using because they believe that use of PPE are uncomfortable similar to the result of the survey conducted in Hong Kong⁹⁾.

In conclusion, this study revealed that a good knowledge and appropriate attitude were found in low level as same as the practice of using respirator. Thus, it is suggested that intervention tools should be developed for enhancing the knowledge and attitude of rattan craftsmen workers while they should be continuously trained in the use of respirator and other PPEs.

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REFERENCES:

1. Hathaway GJ, Proctor NH, Hughes JP. 1996. Chlorine. Proctor and Hughes' Chemical Hazards of the Workplace (New York, Van Nostrand Reinhold).
2. Lipsett M. 2001. Oxides of Nitrogen Sulfur. Clinical Environmental Health and Toxic

Exposures (Philadelphia, Lippincott, Williams & Wilkins).

3. ATSDR. 1998. Toxicological Profile for Sulfur Dioxide. Atlanta.
4. Amdur MO, Klaassen CD, Doull J. 1986. Casarett and Doull's toxicology: the basic science of poisons. London, New York, Toronto, Macmillan, 3rd ed. p. 801-824.
5. Paramasivam P, Narayani K, Anind KG. 2007. Knowledge, Attitude and Practices Related to Occupational Health Problems among Garment Workers in Tamil Nadu, India. *Occup Health* 49: 528-534.
6. Attia ZT. 2000. Knowledge and practice of preventive measures in small industries in Al-Khobar. *Saudi Med* 21(8): 740-745.
7. Yassin MM, Abu Mourad TA, Safi JM. 2002. Knowledge, attitude, practice, and toxicity symptoms associated with pesticide use among farm workers in the Gaza Strip. *Environ Med* 59: 387-394.
8. Ignatius TS, Nga LL, Wong TW. 2005. Knowledge, Attitude, and Practice regarding organic solvents among printing workers in Hong Kong. *Occup Health* 47: 305-310.
9. OSHC. 2000. A survey on usage of personal protective equipment in Hong Kong: Occupational Safety and Health Council.