

Safety culture and its associated factors among the staff of a government medical/agricultural school in Malaysia

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Abstract: Workers practicing good work safety culture (WSC) will have less accidents at their workplace. This principle applies in public institution as well. Work safety culture is usually studied in the dangerous sectors, but studies on work safety culture among staff of public university setting in Malaysia is scarce. The main objective of this study was to determine the proportion of knowledge, attitudes and practice (KAP) on work safety culture (WSC) and predictors for knowledge, attitudes, practice of work safety culture and its associated factors among the staff of a public university in Malaysia. A cross-sectional study was conducted on 220 randomly selected Malaysian employees who worked for at least one year into two different faculties. The self-administered questionnaire was used to collect information on socio-demographic, employment characteristics, as well as data on knowledge, attitudes and practice towards work safety culture. The results of the study showed that out of 184 respondents who answered the questionnaire 174 (94.6%) had good knowledge on safety culture, 128 (69.6%) had positive attitudes towards safety culture and 140 (76.1%) had good practice towards safety culture. Binary logistic regression test showed that permanent staff is 1.19 times more likely to have higher knowledge (OR=1.19, 95% CI: 1.09-5.70) compared to the other group of respondents. Staff with work duration 10 years and below (OR=1.51, 95% CI: 1.25-6.07), staff with degree/diploma (OR=1.29, 95% CI: 1.19-5.82) and married (OR=1.07, 95% CI: 1.02-5.38) are 1.51, 1.29 and 1.07 times respectively likely to have higher positive attitudes compared to their counterpart. Female staffs 1.92 times more likely to have higher good practice (OR=1.92, 95% CI: 1.45-6.91) compared to the male counterpart. In conclusion, the proportion of good knowledge, positive attitude and good practice of safety culture is high among the staff of UPM but still lower compared to those found in other studies on safety culture, most especially the attitude of the staff towards work safety culture. Based on the findings of this study, future research is needed to find out on why the employee in this institution of those that come from higher education background, higher working experience and single are associated with lower odds of positive attitude towards safety culture and the male staff are as well associated with lower odds of good practice towards safety culture. Hence, in creating awareness on work safety culture in order to minimize work related injury and improve work safety performance a good surveillance data on work safety culture in UPM are needed to determine the level of work safety culture and to plan programs for its improvement.

Keywords: Safety culture, KAP of safety culture, associated factors, Malaysia

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I. Introduction

It is important for employees to remain healthy and to work in a safe environment while working because their general work safety performance can be affected by exposure to various hazards which could lead to accidents at work. Ill health is likely to be accompanied by many psychosocial problems such as depression, personal suffering, economic loss, and loss of self-confidence and self-esteem due to poor safety culture at work (11), (5), (16).

Safety culture is defined as "the product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of an organization's management of safety (12). Safety culture is also defined as the attitude, beliefs, perceptions and values that employees share in relation to safety in the workplace (6). Safety culture is a part of organizational culture, and has been described by the phrase "the way we do things around here (23)". Study done by (20) on safety culture, explained the concept of safety culture summarized as the safety perceptions which employees share about their work environments and act as a frame of reference for guiding appropriate and adaptive safety behavior. In its simplest form, he explained that culture is the way things are done in the organization in relating to safety (20).

Since the disastrous nuclear accident at the Three Mile Island (USA) in 1979 and Chernobyl (Ukraine) in 1986, public attention became focused on safety culture and the term safety culture has been put into serious

consideration in order to minimize the rate at which everyone is exposed to accident or injury at work because the accident investigation in Chernobyl revealed many irregularities in the organizational safety culture (9). Based on some of the definitions of safety culture stated above, researchers come to a conclusion that safety culture is an important concept needed by every organization to create awareness about safety in the work place in order to minimize the level of exposure of the employees and everyone to injury and accident at work and also a more favorable safety culture is associated with improved safety performance (17), (19).

Statistics of occupational accidents in Malaysia revealed a continuous reduction from the 2000 to 2008. However, the statistics remained static since 2009. 37% and 22% of all fatal injuries investigated by the Department of Occupational Safety and Health (7) were from construction industry and manufacturing industry. Hearing and back diseases accounted for 34% of the occupational diseases. Occupational diseases caused by chemical agents was 4% of all cases. In the year of 2011, the number of investigated accidents involving loss of life is about 7% or 176 cases out of 2,429 cases. The high occupational accidents stated above is probably due to lack of safety culture and non-compliance of the requirements of Occupational Safety and Health Act (OSHA) 1994.

Researchers have shown that different factors affect the KAP of safety culture among employees (2). For example, socio demographic factors like age, gender, ethnicity, educational level and occupational characteristics like job title, employment status and work duration (18). University population comprises people in different jobs that include lecturers, office and administrative workers, physical plant employees, clinicians, and research and teaching assistants and Malaysia has about 20 public universities and around 450 private higher learning institutions, including 25 universities, 22 university colleges, as well as five branch campuses (22). Given such diversity within the academic setting in terms of the type of work, therefore as a result of this, safety measure must be put in place in order to minimize the level of exposure of both the staff and the students to occupational hazards in the university.

In Malaysia, a considerable number of studies have focused on safety culture in different sectors, for example in furniture manufacturing industry (13), but the literature for KAP of safety culture among staff of the university setting in Malaysia is scarce. In Malaysia, a considerable number of studies have focused on safety culture in different sectors, for example in furniture manufacturing industry (13), but the literature for KAP of safety culture among staff of the university setting in Malaysia is scarce. Therefore, this study determined the factors that affect KAP of safety culture among Malaysian university staff and showed how socio-demographic and occupational factors are related to KAP of safety culture among the academic, administrative and support staff of the universities.

II. Material and Methods

2.1 Study Design and Study Population

A cross-sectional study design was used to determine the level of KAP of safety culture and its associated factors. This study was conducted on 184 randomly selected Malaysian staff with a working experience of at least 1 year in the university. The study location is Faculty of Medicine and Health Sciences and Faculty of Agriculture of a public university (UPM), situated in Serdang Selangor, Malaysia.

2.2 Materials

A self-administered questionnaire, which was written in both English and Malay language was used to collect information. The questionnaire is divided into five sections; Section A, collects information on the socio-demographic background, such as gender, age, race, type of job, educational level, and monthly income and Section B is for the employment characteristics, such as work duration, job title, employment status and department. Information on knowledge on safety culture are collected in Section C. Information on attitude towards safety culture are collected in section D. The last section, Section E, contained information on practice towards safety culture among the respondents.

2.3 Data collection

The questionnaire was distributed directly to the respondents. They were informed about the purpose of the study and those participating in it, did so on a voluntary basis. Besides, the respondents were assured that their answers will be kept confidential and will only be used for research purposes. After the respondents have finished answering the questions, the questionnaires were collected immediately.

2.4 Data Analysis

The data was analyzed using the IBM Statistical Package of Social Sciences (SPSS) version 22. Initially the data was analyzed descriptively using frequency, percentage, means and standard deviations. All numerical data were tested for normality before further analyses. Bivariate analysis (Chi-square test) was used to determine the association between KAP of safety culture and the independent variables (socio-demographic

and occupational factors). Finally a multivariate analysis using binary logistic regressions was performed to determine the factors associated with the KAP of safety culture. The results were considered statistically significant if $p < 0.05$. Ethics approval to conduct the study was obtained from the Ethics Committee for Research Involving Human Subjects of Universiti Putra Malaysia (JKEUPM), and permission to do the study was obtained from Dean of FMHS and FA, Ref. No: UPM/TNCPI/RMC/1.4.18.2 (JKEUPM) dated 29TH June 2016.

III. Results

3.1 General Overview

Out of 220 questionnaires distributed, 184 respondents answered it, giving a response rate of 83.6%. The socio-demographic characteristics of the respondents are shown in Table 3.1. Majority of them are in the age group ≤ 40 (63.6%). Their age ranged from 22 to 70 years, with the mean \pm sd of 39.6 ± 11.1 (year). Mostly were females (59.2%), Malay (86.4%), married (72.2%), have at least Diploma qualification (44.6%), and 74 (40.3%) of them have a Doctoral Degree qualification. The monthly income of the respondents ranged from RM 1000 to 20,877 (USD 255 – 5350), with the mean \pm sd of $RM 4994 \pm 3688.10$ (USD 1280 – 946). Majority of them earn \leq RM 5000 (USD 1282) per month (66.1%).

Table 3.1: Distribution of respondents by socio-demographic characteristics (n=184)

Variable	Frequency	Percentage (%)	Mean \pm sd
Gender			
Male	75	40.8	
Female	109	59.2	
Age Group (Year)			
≤ 40	117	63.6	39.6 \pm 11.1
> 40	67	36.4	
Race			
Malay	159	86.4	
Non-Malay	25	13.6	
Marital status			
Married	142	77.2	
Single	42	22.8	
Educational level			
Diploma	82	44.6	
Degree	28	15.1	
Post-degree	74	40.3	
Monthly Income (RM)			
≤ 5000	115	66.1	4994 \pm 3688.10
> 5000	59	33.9	

Notes: Non-Malay are the following ethnic group: Chinese, India and Others. Single are the following group: Single, Widow and Divorced. Diploma are the following group: Secondary School, Diploma and Others. Post-Degree are the following group: Master and PhD. USD 1 about RM4 (as of 5th June 2018)

For the occupational characteristics, out of 184 respondents, 81.5% of them are permanent staff, work as administrative staff (30.4%). Most of them had been in service for less than 10 years (70.7%) (Table 3.2).

Variable	Frequency	Percentage (%)	Mean \pm sd
Job Title			
Professor	6	3.3	
Associate Prof.	21	11.4	
Senior Lecturer	34	18.5	
Tutor	7	3.8	
Administrative staff	56	30.4	
Laboratory staff	36	19.6	
Driver	5	2.7	
Others	19	10.3	
Department			
In FMHS	56	30.4	
In FA	128	69.6	
Employment Status			
Permanent	150	81.5	
Temporary	17	9.2	
Contract	17	9.2	
Work Duration Group (Years)			
≤ 10	130	70.7	10.30 \pm 9.70
> 10	54	29.3	

Notes:

Departments in FMHS: Family Medicine, Medicine, Psychiatry, Imaging, Pathology, Pediatric, Surgery, Community Health, Anatomy, Obstetrics & Gynecology, Medical Microbiology & Parasitology and Orthopedics, Biomedical Science, Nutrition and Dietetics, Occupational Health, Nursing and Rehabilitation

Departments in FA: Crop Science, Animal Science, Plant Protection, Land Management, Agribusiness & Bio-resource Economics, Agriculture Technology, Aquaculture.

In this study the characteristics of KAP on work safety culture was described and categorized based on the study done by (18), KAP regarding work safety culture among the staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. According to the said study the scoring of the knowledge level, attitude level and practice level were categorized as good or poor for knowledge, negative or positive for attitude and also good or poor for practice among the respondents (18).

Table 3.3: Proportion of KAP on work safety culture among the respondents

Proportion of knowledge on safety culture among the respondents						
Variable	Good(%)	Poor(%)	Range	Min	Max	Mean ± sd
Knowledge score	94.6	5.4	27.0	214.0	241.0	235.0 ± 4.7
Proportion of attitude towards safety culture among the respondents						
Variable	Positive(%)	Negative(%)	Range	Min	Max	Mean ± sd
Attitude score	69.6	30.4	26.0	67.0	93.0	82.2 ± 5.2
Proportion of practice towards safety culture among the respondents						
Variable	Good(%)	Poor(%)	Range	Min	Max	Mean ± sd
Practice score	76.1	22.8	19.0	74.0	93.0	86.8 ± 4.2

Notes: Numerical data for knowledge, attitude and practice on KAP of WSC were tested for normality and they were normally distributed.

Table 3.3 and figure 3.1, 3.2 and 3.3 showed that majority of the respondents (94.6%) had good knowledge on work safety culture, 69.6% of the respondents had positive attitude towards work safety culture and 76.1% of the respondents had good practices towards work safety culture.

Figure 3.1

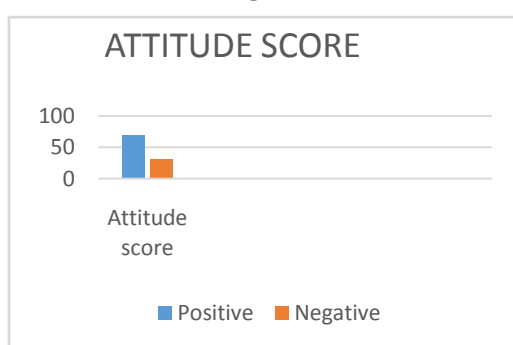


Figure 3.2

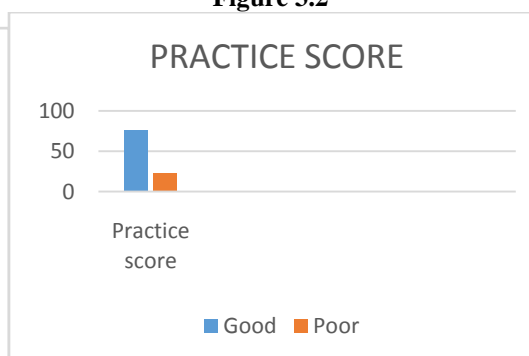
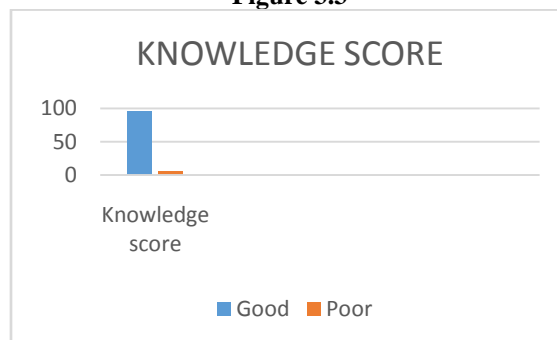


Figure 3.3



3.2: Association between knowledge on work safety culture and socio-demographic and occupational factors

Pearson's chi-square test is used to determine the association between knowledge on work safety culture and the socio-demographic profiles (gender, age, race, marital status, education level and monthly income in table 3.4 and occupational profiles (job titles, department, employment status and work duration) in Table 3.5. Table 3.4 shows that there is no significant association between all socio-demographic characteristics and knowledge on work safety culture and table 3.5 shows that only employment status had a significant association with knowledge on work safety culture, $p=0.031$

Table 3.4: Association between socio-demographic factors and knowledge on safety culture (n=184)

Factors	Level of Knowledge on Safety Culture		p-value
	Good, n= 174 (94.6%)	Poor, n= 10 (5.4%)	
Gender			0.74
Male	70(93.3)	5(6.7)	
Female	104(95.4)	5(4.6)	
Age Group (Year)			1.00
≤40	111(94.9)	6(5.1)	
>40	63(94.0)	4(6.0)	
Race			0.33
Malay	151(95.0)	8(5.0)	
Non-Malay	23 (82.0)	5 (18.0)	
Marital status			0.16
Married	134(94.4)	8(5.6)	
Single	40 (95.2)	2 (4.8)	
Educational level			0.38
Diploma	78 (95.0)	4 (5.0)	
Degree	26 (93.0)	2 (7.0)	
Post-degree	70 (94.0)	4 (6.0)	
Monthly Income Group(RM)			0.27
≤5000	108(93.9)	7(6.1)	
>5000	58(98.3)	1(1.7)	

Notes:Non-Malay are the following ethnic group: Chinese, India and Others

Single are the following group: Single, Widow and Divorced

Diploma are the following group: Secondary School, Diploma and Others

Post-Degree are the following group: Master and PhD

Table 3.5: Association between occupational characteristics and knowledge on safety culture (n=184)

Factors	Level of Knowledge on Safety Culture		p-Value
	Good, n= 174 (94.6%)	Poor, n= 10 (5.4%)	
Job Title			0.13
Academic	65(95.6)	3(4.4)	
Non-Academic	109(94.0)	7(6.0)	
Department			0.89
In FMHS	120(68.9)	5(50.0)	
In FA	54(31.1)	5(50.0)	
Employment Status			0.031*
Permanent	144(96.0)	6(4.0)	
Temporary	14(82.4)	3(17.6)	
Contract	16(94.1)	1(5.9)	
Work Duration Group (Years)			1.00
≤10	123(94.6)	7(5.4)	
>10	51(94.4)	3(5.6)	

Notes:

Departments in FMHS: Family Medicine, Medicine, Psychiatry, Imaging, Pathology, Pediatric, Surgery, Community Health, Anatomy, Obstetrics & Gynecology, Medical Microbiology & Parasitology and Orthopedics, Biomedical Science, Nutrition and Dietetics, Occupational Health, Nursing and Rehabilitation

Departments in FA: Crop Science, Animal Science, Plant Protection, Land Management, Agribusiness & Bio-resource Economics, Agriculture Technology, Aquaculture.

Academic are the following job title: Professor, Associate Professor, Senior Lecturer and Tutors

Non-Academic are the following job title: Administrative staff, Laboratory staff, Driver and others

3.3: Association between attitudes towards work safety culture and socio-demographic and occupational factors

The association between attitudes towards work safety culture and socio-demographic and employment characteristics was also analyzed using Pearson's chi square test. Table 3.6 and table 3.7 below illustrates the result of the analysis. Table 3.6 shows that there is a statistically significant association between attitudes towards safety culture and educational level, $p = 0.020$ and table 3.7 shows that only work duration of service had a significant association with attitude towards work safety culture, $p = 0.036$.

Table 3.6: Association between socio-demographic factors and attitudes on safety culture (n=184)

Factors	Attitude towards safety culture		p-Value
	Positive, n= 128 (69.6%)	Negative, n= 56 (30.4%)	
Gender			0.28
Male	56(74.7)	19(25.3)	
Female		72(66.1)	37(33.9)
Age Group (Year)			0.09
≤40	80(68.4)	37(31.6)	
>40	48(71.6)	19(28.4)	
Race			1.00
Malay	111(69.8)	48(30.2)	
Non-Malay	17(68.0)	8(32.0)	
Marital status			0.051*
Married	104(73.2)	38(26.8)	
Single	24 (57.1)	18 (42.9)	
Educational level			0.020*
Diploma	54 (65.9)	28 (34.1)	
Degree	20 (71.4)	8(28.6)	
Post-degree	24 (54.5)	20 (45.5)	
Monthly Income Group (RM)			0.87
≤5000	79(68.7)	3(31.3)	
>5000	42(71.2)	17(28.8)	

Table 3.7: Association between occupational characteristics and attitudes towards safety culture (n=184)

Factors	Attitude towards safety culture		p-Value
	Positive, n= 128 (69.6%)	Negative, n= 56 (30.4%)	
Job Title			0.44
Academic	50 (73.5)	18 (26.5)	
Non-Academic	78 (67.2)	38 (32.8)	
Department			0.07
In FMHS	86 (67.2)	42 (75.0)	
In FA	42 (32.8)	14 (25.0)	
Employment Status			0.79
Permanent	104 (69.3)	46 (30.7)	
Temporary	11 (64.7)	6 (35.3)	
Contract	13 (76.5)	4 (23.5)	
Work Duration Group (Years)			0.036*
≤10	94 (72.3)	36 (27.7)	
>10	34 (63.0)	20 (37.0)	

3.4: Association between practices towards safety culture and socio-demographic and occupational factors

The association between practices towards work safety culture and socio-demographic and employment characteristics was also analyzed using Pearson's chi square test. Table 3.8 and table 3.9 below illustrates the result of the analysis. Table 3.8 shows that there is a statistically significant association between practices towards safety culture and gender, $p = 0.039$ and table 3.9 shows that only employment status had a significant association with practices towards work safety culture, $p = 0.053$.

Table 3.8: Association between socio-demographic factors and practices towards safety culture (n=182)

Factors	Practice towards safety culture		p-Value
	Good, n= 140 (76.1%)	Poor, n= 42 (22.8%)	
Gender			0.039*
Male	56(76.7)	17(23.3)	
Female	84(77.1)	15(22.9)	
Age Group (Year)			0.52
≤40	91(78.4)	25(21.6)	
>40	49(74.2)	17(25.8)	
Race			0.23
Malay	121(77.1)	36(22.9)	
Non-Malay	19 (76.0)	6 (24.0)	
Marital status			0.63
Married	107(76.4)	33(23.6)	
Single	33 (78.6)	9 (21.4)	
Educational level			0.69
Diploma	61(75.3)	20 (24.7)	
Degree	19 (70.4)	8 (29.6)	
Post-degree	60 (81.1)	14 (18.9)	
Monthly Income Group (RM)			0.12
≤5000	84(74.3)	29(25.7)	
>5000	50(84.7)	9(15.3)	

Notes: Two missing data, n= 182

Table 3.9: Association between occupational characteristics and practices towards safety culture (n=182)

Factors	Practices towards safety culture		p-Value
	Good, n= 140 (76.1%)	Poor, n= 42 (22.8%)	
Job Title			0.32
Academic	56(82.4)	12(17.60)	
Non-Academic	84(73.7)	30(26.30)	
Department			0.48
In FMHS	100(71.4)	27(64.3)	
In FA	40(28.6)	15(35.7)	
Employment Status			0.053
Permanent	112(75.7)	36(24.3)	
Temporary	15(88.2)	2(11.8)	
Contract	13(76.5)	4(23.5)	
Work Duration Group (Years)			0.24
≤10	103(79.2)	27(20.8)	
>10	37(71.2)	15(28.8)	

Note: Two missing data, n= 182

3.5 Logistic regression of KAP on work safety culture

Knowledge, attitude and practice on safety culture among the respondents. The process included only independent variables with statistically significant association with KAP of safety culture. Binary logistic regression in the SPSS software was used to estimate the predictor factors on variables which were found to be significant in Pearson's chi-square test ($p < 0.05$). It was revealed from multivariate analysis that Hosmer-Lemeshow (goodness of fit) as a significant value larger than 0.05, therefore indicating support for the regression model, for knowledge ($X^2 = 2.131$, $df = 1$, $p = 0.998$), for attitude ($X^2 = 2.397$, $df = 7$, $p = 0.935$) and for practice ($X^2 = 1.027$, $df = 2$, $p = 0.997$).

Permanent staff is 1.19 times more likely to have higher good knowledge about safety culture (OR=1.19, 95% CI: 1.09-5.70), compared to temporary and contract staff among the respondents.

Logistic equation for knowledge

$$\text{LogY} = 1.573 + 1.638 (X) + \varepsilon$$

Where:

Y= Knowledge on safety culture

X= Employment status

ε = Error

The Nagelkerke R^2 shows that the predictor variables recorded in the regression model explained about 21.6% of the variation of knowledge on safety culture.

Table 4.0: Logistic regression analysis of knowledge on safety culture among the respondents (n=184)

Variable Coefficient	B	S.E.	Sig. OR	Adjusted Lower	95% C.I. for OR Upper
Employment Status					
Permanent	1.638	0.761	0.031*	1.19	1.09 5.70
Temporary Contract					
Constant	1.573	1.031	0.715	1.218	

* Significance level, p<0.05.

Staff that had working experience that is 10 years and below (OR=1.51, 95% CI: 1.25-6.07) with Degree/Diploma certificate (OR=1.29, 95% CI: 1.19-5.82) and are married, more likely to have higher positive attitude towards safety culture compared to staff that had working experience above 10 years and are with post-degree certificates and also single/widow/divorced

Logistic equation for attitudes

$$\text{LogY} = 1.915 + 0.655 (X_1) + 1.277 (X_2) + 0.068 (X_3) + \epsilon$$

Where:

Y= Attitudes towards safety culture

X₁= Work duration

X₂= Educational level

X₃= Marital status, ε= Error

The Nagelkerke R² shows that the predictor variables recorded in the regression model explained about 20.3% of the variation of attitudes towards safety culture

Table 4.1: Logistic regression analysis of attitude towards safety culture among the respondents (n=184)

Variable Coefficient	B	S.E.	Sig. OR	Adjusted Lower	95% C.I. for OR Upper
Work Duration (Years)					
<10			0.655	0.370	0.036* 1.51 1.25 6.07
>10					
Educational Level					
Diploma					
Degree			1.227	0.526	0.020* 1.29 1.19 5.82
Post-degree					
Marital Status					
Married	0.068	0.457	0.051*	1.07	1.02 5.38
Single/widow/divorced					
Constant	1.915	1.043	0.586	1.352	

* Significance level, p<0.05.

Female staff (OR=1.92, 95% CI: 1.45-6.91) are more likely to have good practice towards safety culture compared to their male counterpart. The odds of having good practice towards safety culture among female staff was about 1.92 times greater compared to the male staff.

Logistic Equation for practices

$$\text{LogY} = 1.165 + 0.075 (X_1) + \epsilon$$

Where:

Y= Practices towards safety culture

X₁= Gender

ε= Error

The Nagelkerke R² shows that the predictor variables recorded in the regression model explained about 23.2% of the variation of practices towards safety culture

Table 4.2: Logistic regression analysis of practice towards safety culture among the respondents (n=182)

Variable Coefficient	B	S.E.	Sig.	Adjusted OR	95% C.I. for OR Lower Upper
Gender					
Male					
Female	0.075	0.369	0.039*	1.92	1.45 6.91
Employment Status					
Permanent					
Temporary Contract					
Constant	1.165	0.610	0.056	3.206	

Note: Two missing data, n= 182, * Significance level, p= 0.05

IV. Discussion

As a result of lack of studies on work safety culture among university staff, studies on safety culture in other sectors was used to compare with this present study. In this study, majority of the respondents had good knowledge on safety culture which means, majority of the participants in the study had good knowledge on work safety culture. This finding is similar to the study conducted by (4) which showed that 95.8% of the respondents scored higher out of the 14 dimensions of the patient safety culture survey to assess the level of the knowledge of safety culture among the health care staff in the Swedish Hospital Survey on Patient Safety Culture (S-HSOPSC) and (8) conducted a study in Lund University in Sweden, which reported that the average scores for the nine safety culture dimensions showed that air traffic controller had a higher average score by 97% of the respondents in the aviation industry (4), (8).

About 69.6% of the respondents had positive attitude towards safety culture. In general, the attitude regarding safety was good with more than half of the respondents reporting positive attitude towards safety culture in their work place. This finding similar to the results of (1), in their study among nurses at Student University Hospital in Egypt, which showed that 83.3% of the respondents had a higher scored in the overall safety culture dimensions to assess the level of attitude towards patient safety culture among the nurses and also in a study conducted in USA, Netherlands and Taiwan, assessing patient safety culture in hospitals across countries showed the overall level of patient safety culture was 72.7% (21).

The practice of safety culture was reported by 76.1% of the respondents with slightly more than three quarters of the respondents had good practice towards safety culture. Similar to this study is the study conducted by (10) among health care staff in Riyadh, which showed that the overall perception of safety culture by the respondents is 78.5% of positive response (good practice) and also studies conducted in Sri Lanka, factors affecting patient safety culture in a tertiary care hospital and in China, hospital survey on patient safety culture showed that the overall level of patient safety culture was 78.4% and 85% respectively (3), (15).

The proportion of good knowledge, positive attitude and good practice towards safety culture in this study was encouraging but still low compared to those found in other studies on safety culture stated above, most especially the attitude of the staff towards safety culture. Therefore, more education on safety culture still need to be done among the university staff in order to create more awareness about safety culture and this will eventually minimize the level of exposure of the employees and everyone to injury and accident at work and also a more favorable safety culture is associated with improved safety performance (17), (19).

In this study none of the socio-demographic characteristics have a statistically significant association with knowledge on work safety culture (WSC). However, in some other studies knowledge on WSC was significantly associated with gender (female workers had the highest level of knowledge on WSC), (18), (2). This same study showed that, knowledge on safety culture had a significant association with only employment status among occupational factors, which is in line with studies done by (18) which revealed that permanently employed staff had higher good knowledge and positive attitude towards safety culture compared to their temporarily employed counterpart and contrary to this, is the study done by (13) found that temporary workers had a higher good knowledge and positive attitudes towards work safety culture in the furniture industry and these make them to be more productive and less accident prone compared to their local permanent workforce.

This study showed as well that there was a significant association between attitudes towards safety culture and marital status (married workers had higher attitudes towards safety culture than their single counterpart), (1) and (18) research support this finding. Contrary to this finding, (4), revealed that married staff scored patient safety culture lower than single staff for nine dimensions, which means the single staff had a higher positive attitude towards safety culture compare to married staff at the health care division in a Swedish country council. There was a significant association between attitude towards safety and work duration (staff with lower work duration had higher attitudes towards safety culture compared to their counterpart) supported by (2) study which showed as well that employees with shorter years of working experience had higher attitude towards safety culture than the ones with longer working experience. In contrast findings from a study conducted in Sweden by (4) among 1023 health care staff working in the medical, surgical and mixed medical-surgical health care divisions revealed that respondents with longer total working experience scored higher for the patient safety culture dimensions than those with shorter working experience at the health care divisions.

This study also found that there are significant association between practice towards work safety culture (WSC) and gender and. The practice towards safety culture was significantly associated with gender and the odds of having good practice towards safety culture among female staff was 1.92 times higher than the male staff. This finding is similar to the study done by (2) and (14).

Factors that were found to be statistically significant predictors for KAP of work safety culture include five independent variables, namely; employment status for knowledge on safety culture, work duration, educational level and marital status for attitude towards safety culture, gender for practice towards safety

culture. The results revealed that the permanent staff are 1.19 times more likely to have good knowledge about safety culture, compared to their temporary and contract staff among the respondents. There is little information about KAP of safety culture in the higher education sector; so is somehow difficult to compare this result with the results in the literature, because most of the research was conducted among different working groups in different working populations. However, the results of this study is similar to a previous study conducted in a similar working population, revealed through logistic regression analysis that the knowledge on safety culture among those who have been working for less than 8 years were 1.76 times greater compared to those with longer working duration (18).

Staff that had working experience that is 10 years and below with diploma/degree certificate and are married, more likely to have higher positive attitude towards safety culture compared to staff that had working experience above 10 years with post-degree and are single/widow/divorced. The results of this study is similar to study conducted by (10), revealed that staff with lesser working experience had a higher score of overall safety attitude dimension compare with the staff with higher working experience and the odds of having a better attitude towards safety culture is 1.31 times more than the staff with higher working experience (10) and (21).

Female staff are more likely to have higher good practice towards safety culture compared to their male counterpart. However, the results of this study is similar to a previous study conducted by (14) and (10) among health care staff in Saudi Arabia, which revealed through logistic regression analysis that the overall score on patient safety culture dimension among female staff in the multi-site Medical city in Riyadh was 0.62 times significantly higher than their male staff (14).

V. Conclusion

This study reports that good knowledge, positive attitude and good practice of safety culture was high among staff at the two faculties in UPM but still lower compared to those found in other studies on safety culture, especially the attitude of the staff towards safety culture. Among the staff in both faculties those who come from higher education background, longer working experience and single are associated with lower attitude towards safety culture and the male staff too are associated with lower practice towards safety culture. Hence, in creating awareness on work safety culture in order to minimize work related injury at work and to improve work safety performance, management staff in this university should be more alert, and to identify staff with higher education background, higher working experience and single as such staff are more likely to have lower positive attitude towards safety culture and male staff as well are more likely to have lower good practice towards safety culture at work. However, the KAP on work safety culture can be improved to prevent work related injury and served as an indicator to assure work safety performance. Hence, the present study is a cross sectional survey to report the level of KAP of safety culture among the respondents who work in the study location and the possible risk factors of KAP of safety culture. The consequences of this study could serve as a basis for future studies and to have bigger samples size with more faculties and different universities including the technical, private and government universities.

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