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Knowledge, Attitudes, and Practices Toward Physical Activity Among Public Sector Librarians in Brunei: A Cross-Sectional Study

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Abstract

Introduction: Physical inactivity is a global public health concern associated with non-communicable diseases such as cardiovascular disease, obesity, diabetes, and certain cancers. Sedentary occupations, including librarianship, characterised by prolonged sitting and low levels of physical movement, have been associated with these health risks. This study assessed the knowledge, attitudes, and practices (KAP) towards physical activity (PA) among public sector librarians in Brunei Darussalam. **Materials and Methods**: A cross-sectional study was conducted among 194 librarians using a validated questionnaire with a response rate of 71.85%. The participants comprised of 137 females (70.6%) and 57 males (29.4%), with a mean age of 39.8 years (SD = 8.9). Descriptive statistics and multiple linear regression were conducted to examine the associations between demographic variables and KAP scores. **Results**: The findings revealed good knowledge (Mean 8.71, SD = 1.12), poor attitudes (35.63, SD 3.97), and satisfactory practices (Mean = 23.49, SD = 3.18) towards PA. Regression analysis found that librarians with librarians with tertiary education had significantly higher knowledge scores than those with secondary education (p=0.046), and those who did not engage in PA had lower knowledge (p=0.009) and practice scores (p=0.000) compared to those who did. Female librarians had lower attitude scores than their male counterparts (p=0.003). Age groups 40 – 49 (p=0.014) and 50 – 60 (p=0.023) had significantly higher practice scores than younger age groups. **Conclusion**: Significant associations were found between KAP towards PA and demographic variables such as education level, gender, age, and PA engagement. These findings may also be relevant to other occupations with similar sedentary workstyles, suggesting that workplace health interventions promoting physical activity could benefit a broader range of desk-based professionals beyond librarians.

Keywords: Public health, Knowledge, Attitude, Practices, Physical activity

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INTRODUCTION

Librarians are regarded as sedentary occupations[1], as they work in environments that require prolonged sitting due to tasks such as cataloguing, computer use, and customer service,[2] The increasing digitisation of library services has further reduced opportunities for physical movement during work hours, making librarians one of the professional groups at risk of sedentary behaviour (SB) and physical inactivity (PI).[3] Other occupation with similar sedentary workstyles include office workers[4], bankers[5], hospital workers[6], academic staff[7], and university employees.[8] Studies suggest that individuals in sedentary occupations are more likely to exhibit PI outside of work, heightening their risk of chronic diseases associated with PI.[9, 10]

PI has been recognised as a significant global public health issue, contributing to the rising prevalence of non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, and obesity. Globally, PI is the fourth leading risk factor for mortality, responsible for approximately 6% of deaths.[11] In Brunei Darussalam, NCDs account for 85% of adult mortality, making them a pressing public health challenge.[12] The World Health Organisation (WHO) also reported that in 2022 the prevalence of PI among adults aged 18 – 70 is 21% for males and 34% for females.[13] PI is defined as not meeting the recommended levels of PA, which for adults is at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity per week, or an equivalent combination.[14] This study aligns with Brunei's National Physical Activity Guidelines, which emphasise reducing sedentary behaviour and promoting workplace-based physical activity (PA) initiatives as a strategy to combat NCDs.[15]

Despite increasing attention to occupational health and PA, there is limited research on PA levels among sedentary professional groups, such as bankers[5], hospital workers[6], academic staff[7], and university employees[8], including librarians. Globally, no studies have specifically examined the knowledge, attitudes, and practices (KAP) toward PA in librarians, leaving a critical gap in understanding how occupational SB impacts health behaviours in this population. This study aims to to address this gap by focusing on public sector librarians in Brunei Darussalam as a representative sedentary occupational group. By assessing their KAP related to PA, this study contributes to the growing body of literature on PA in sedentary professions and informs the development of tailored interventions to promote PA and reduce the burden of NCDs among librarians and similar occupational groups.

MATERIALS AND METHODS

Study Design and Sampling method

A quantitative, cross-sectional study using self-administered online survey was conducted from January 2024 to March 2024. This study was conducted in government-run libraries located across the four districts in Brunei.

The sample size for this study was determined using a sample size calculator specifically designed for prevalence studies.[16] The precision (d) is typically set at 0.05. For this study, the expected prevalence (P) was based on data from a national survey on PA among adolescents in Brunei, which reported a prevalence of 11.5% in 2019[15]. The population size (N) was set to 311, representing the total number of public sector librarians in Brunei[17]. With $P = 0.115$, the $N = 311$, and a $d = 0.05$, the calculated sample size was 157. To address potential non-response, an additional 50% was added to the sample size, generating a final total of 235 participants to ensure adequate statistical power.

The eligibility criteria for this study were librarians aged 18 to 60 years who were employed as public sector librarians, and fluent in either English or Malay. Participants required to be willing to participate in the study. Individuals younger than 18 or older than 60, and those not working as librarians, were excluded. Participants were recruited using a convenience sampling method. Eligible respondents were selected and reached through focal persons appointed from participating libraries that granted consent for the study. These focal persons facilitated the distribution and collection of

surveys. Participants were presented with a detailed description of the study's objectives and informed that their responses would remain confidential, as identifiable data were coded with unique ID numbers.

Data collection

The research instrument used in this study was adapted from a previously validated questionnaire that had been successfully used in assessing KAP toward PA in occupational settings.[6] The tool underwent a rigorous adaptation process, including expert evaluation, translation into the participants' primary language for cultural relevance[18], and pretesting to ensure clarity. A pilot test among a subset of the target population confirmed the instrument's cultural relevance and content validity. The internal consistency (Cronbach's alpha > 0.69) was near to the threshold of 0.7, suggesting borderline acceptable reliability, which is reasonable for an exploratory study.[19]

The variables measured in this study were sociodemographic characteristics such as age, gender, job category, education and PA engagement. Meanwhile, the outcome measured were knowledge, attitudes, and practices. Knowledge was assessed using 11 yes/no questions, with one point awarded for each correct answer. Scores were categorised as excellent (> 80%), good (60 – 79%), some knowledge (50 – 59%), or poor (< 49%). Attitudes were measured using 12 Likert-scale items, with responses ranging from strongly disagree (1 point) to strongly agree (5 points). Practices were similarly measured using seven Likert-scale items. For both attitudes and practices, scores were categorised as satisfactory (> 60%) or unsatisfactory (< 59%). The primary exposure was participants' engagement in PA, categorised as "yes" or "no". Sociodemographic predictors included age (grouped into categories), gender, education level (secondary or higher), and job position (officer or non-officer).

Statistical Analysis

Statistical analysis was performed using RStudio version 4.3.2. Descriptive statistics were presented using frequencies and percentages for categorical variables. Inferential statistics such as independent *t*-tests and one-way ANOVA were used to compare the means of the sociodemographic variables and KAP scores. Within this study, certain sociodemographic variables such as job position and education, had categorical groups that did not meet the minimum requirement of 30 samples. Consequently, the two variables were transformed into binary categories. The job position was recoded as either officers or non-officers, while education was recoded as either having completed secondary education or having higher education. In the Brunei Public Service job scheme, Division I, II, and III positions are classified as officer-level roles, typically encompassing professional and administrative positions such as senior librarians, librarians or library officer, and assistant library officer. Divisions IV and V positions are designated as non-officer roles, representing support-level occupations such as library assistants.[20] Multiple linear regression (MLR) analysis was further conducted to evaluate the association between sociodemographic variables with KAP towards to PA, and a $p<0.05$ was deemed to indicate statistical significance.

Ethics approval was obtained from the Pengiran Anak Puteri Rashidah Sa'adatul Bolkiah (PAPRSB) Institute of Health Science Research Ethics Committee (IHSREC) (Reference: UBD/PAPRSBIHSREC/2023/76). Participants were informed that data would be entered into a password-protected study database that was accessible to the research team only.

RESULTS

The survey reached 270 librarians, 194 (71.85%) of who completed the survey from 56 different libraries. Most respondents were female (84.54%), held non-officer positions (71.65%), and had secondary education (59.28%). Of the overall sample, 147 (75.8%) reported engaging in physical activity, while 47 (24.2%) indicated no participation (**Table I**).

Most participants demonstrated good knowledge of PA, with 91.24% recognising its role in preventing heart disease and 96.39% acknowledging its health benefits. Over 90% correctly identified moderate-intensity PA recommendations and other key PA-related knowledge (**Table II**).

While 98.45% agreed exercise has health benefits and 94.30% emphasised the importance of being physically healthy, 87.05% reported a lack of time for PA. Additionally, 76.16% reported low motivation, and 61.14% expressed that workplace incentives would encourage more activity (**Table III**).

Only 31.61% reported engaging in the recommended amount of PA, with 63.73% intending to start more PA within six more months. A small proportion (30.05%) engaged in vigorous-intensity PA three to five times weekly, while 43% performed moderate-intensity

Table I: Sociodemographic characteristics of participants.

Variables	N	(%)
Age (Years)		
18-29	30	15.5
30-39	65	33.7
40-49	50	25.9
50-60	48	24.9
Gender		
Male	30	15.46
Female	164	84.54
Job Category		
Division I	1	0.51
Division II	20	10.31
Division III	34	17.63
Division IV	119	61.34
Division V	20	10.31
Education		
Secondary	115	59.28
Diploma	57	29.38
Bachelor Degree	14	7.22
Master Degree	7	3.61
PhD	1	0.05

Table II: **Participants' knowledge of physical activity.**

Statements	Agreed with the statement	
	n	%
Regular physical activity helps maintain one's body weight.	189	97.42
Regular physical activity can help improve health.	187	96.39
Regular physical activity does not increase the risk of developing depression and anxiety.	184	94.85
One should engage in moderate-intensity exercise for 30 min on 5 days per week, to main good health (e.g. brisk walking, swimming volleyball).	180	92.78
Regular physical activity can prevent heart disease.	177	91.24
Regular physical activity decreases cholesterol and blood pressure.	176	90.72
One should engage in vigorous-intensity exercises for 20 min on 3 days per week, to maintain good health (e.g. running, soccer).	174	89.69
Regular physical activity does not increase the risk of developing type 2 diabetes.	161	82.99
Regular physical activity can cause a drastic drop in blood pressure.	146	75.26
Regular physical activity reduces the risk of getting osteoporosis.	145	74.74
Regular physical activity does not increase the risk of contracting HIV/AIDS.	125	64.43

PA more than five time weekly (**Table IV**). Moderate-intensity *PA* refers to activities that can increase heart rate and breathing, such as brisk walking or light cycling, whereas vigorous-intensity *PA* includes activities that cause fast breathing and substantial increases in heart rate, such as running or stair-climbing.[14]

Knowledge scores were good (mean = 8.71, SD = 1.12), while attitudes were poor (mean = 35.63, SD = 3.97), and practices were satisfactory (mean = 23.49, SD = 3.18). Librarians engaging in PA had significantly higher knowledge and practice scores (p<0.05). Female librarians had lower attitude scores than males (p=0.003), while older age groups (40–49 and 50–60 years) had higher practice scores (p<0.05) (**Table V**).

Table VI (*Refer to Supplementary text*) presents the results of an MLR analysis examining sociodemographic variables and their association with KAP toward PA towards public sector librarians. Librarians with higher education (p=0.046, b=0.32, 95% CI = 0.01, 0.64) and those who engaged in PA (p=0.009, b=-0.49, 95% CI = -0.85. -0.12) showed significantly higher knowledge scores. Higher education was associated with a 0.32-point increase in knowledge scores, while non-engagement in PA was linked to a 0.49-point decrease. Other factors, such as age, gender, and job position, showed no significant associations with knowledge scores. This model explained four % of the variance in knowledge scores (R^2 =0.04).

Only gender, out of all the demographic factors that were examined at, significantly correlated with attitude scores. The mean attitude scores of male and female librarians were 37.21 (SD = 3.65) and 34.89 (SD = 4.02), respectively. This difference was statistically significant, with a difference of 2.32 points (p=< 0.003, b = -2.32, 95% CI: -3.82, -0.80). The only significant predictor of attitude score variance was gender, and this model accounted for four % of the variation (R^2= 0.04).

Significant predictors of practice scores included age and PA engagement. Librarians aged 40–49 years and 50–60 years had significantly higher practice scores compared to those aged below 40. Specifically, those aged 40 – 49 scored higher by 1.74 points (p=0.014, b = 1.74, 95% CI: -0.23 to 3.41), while those aged 50 – 60 scored higher by 1.63 points (p=0.023, b = 1.63, 95% CI: 0.23 to 3.02). Additionally, there was a mean difference of 1.80 points (p=0.001, b = -1.80, 95% CI: -2.81, -0.79) between the practice scores of librarians who did not participate in PA (Mean = 22.68, SD = 3.41) and those who did (Mean = 24.48, SD = 2.79). The overall model explained 11 % of the variance in practice scores (R^2 = 0.11).

Table III: Participants' attitudes toward physical activity.

Statements	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
I would engage in more physical activity if I had more time.	34.20	52.85	9.84	2.59	0.52
We should not rely on our workplace to provide us with incentive to exercise.	20.73	52.33	23.31	2.07	1.55
I would engage in more physical activity if I had more motivation from my colleagues.	26.94	49.22	20.21	2.60	1.04
It is important for me to be physically healthy.	48.70	45.60	5.70	0	0
Exercise provides many benefits, no matter what age we start.	53.89	44.56	1.55	0	0
I would engage in physical activity if my workplace had facilities, e.g. a gymnasium, wellness programme.	30.57	41.45	24.87	2.07	1.04
There are many more important things in life than being physically active.	18.65	37.82	30.57	11.92	1.04
A reward programme at work would be an incentive for me to be more physically active.	28.50	32.64	30.57	7.25	1.04
I am happy with my current body weight.	2.59	20.21	37.82	28.50	10.88
My family history will determine what disease I get, so it does not matter If I exercise or not.	9.84	15.54	31.60	34.20	8.81
Exercising is expensive, and only wealthy people can afford to do it.	6.22	13.99	31.09	36.79	11.92
Overweight people are healthier people.	2.07	5.70	24.35	44.56	23.31

DISCUSSION

The purpose of this study was to investigate the current KAP toward PA among public sector librarians in Brunei Darussalam. Our study found that the participants demonstrated a good level of knowledge on PA (79.18%), poor attitudes toward PA (59.38%) and satisfactory PA practices (67.11%). The study's findings showed that although these librarians demonstrated a good level of knowledge on PA, their attitudes and practices towards PA were less impressive than their knowledge and practices. To the best of our knowledge, this is the first study in Brunei Darussalam and there is also limited literature that focus on a specific sedentary occupational group such as librarians' PA, thus limiting direct comparisons with this group population. However, our comparative analysis was conducted using International Standard Classification of Occupations 2008 (ISCO-08) Major Group 2, "Professionals".[21]

Table IV: Participants' practices of physical activity.

Statements	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
I engage in exercise for pleasure, not only for benefits.	11.40	63.21	20.73	4.66	0
I get all the exercise I need from just doing normal activities.	9.84	53.89	30.05	4.66	1.55
I intend to start doing more physical activity in the next 6 months.	15.03	48.70	33.68	1.55	1.04
I engage in moderate-intensity sports for 30 min more than 5 times a week (e.g brisk walking, dancing)	7.25	35.75	39.90	12.44	4.66
I engage in the right amount of physical activity	3.11	28.50	52.33	15.03	1.04
I engage in vigorous intensity for 20 min, 3-5 times a week (e.g running, soccer)	4.66	25.39	45.08	19.17	5.70
I have a medical condition that prevents me from engage in physical activity	3.63	15.02	41.97	32.12	7.25

The findings from this study align with research on other sedentary occupations, such as bankers in Nigeria[5] and hospital-based staff in South Africa.[6] While librarians displayed good knowledge, their attitudes and practices were comparable to or slightly better than those observed in these groups. This may suggest that targeted interventions for sedentary professions may need to address similar barriers, such as motivation and workplace support.

Time constraints emerged as a major barrier to PA, with 87% of participants indicating they lacked time to engage in regular exercise. Additionally, 72% reported that they would be more active if workplace facilities, such as gyms or wellness programs, were provided. These findings align with studies in the United Kingdom[22] and United States[23], which reported similar findings. A significant proportion (76%) of librarians also highlighted low motivation as a key challenge. Workplace incentive programs, such as rewards or recognition for PA participation, could play a role in addressing this issue. Notably, 61% of participants expressed interest in engaging in PA if incentives were available, demonstrating the potential for structured workplace interventions to enhance PA levels.

The finding from our study's finding of high knowledge levels among librarians mirrors similar outcomes reported among hospital-based[6] and healthcare professionals[24]. However, a difference was found in the attitude domain where librarians reported unacceptably low scores relative to hospital-based and academic staff whose cumulative positive attitudes among hospital-based staff were 100%[24] and healthcare professionals were 72.35%.[6] This may indicate specific workplace influences exist such as absence of health culture or institutional support.

Our study also reported that female librarians reported considerably lower scores than their male counterparts (p=0.003), indicating a gender imbalance in attitudes toward PA. Despite the fact that our participants are professionals, this result is in line with larger population-based research conducted in Portugal and Iran that found that women encounter particular sociocultural difficulties to PA.[25,26]

Besides that, our study discovered that senior librarians, age groups 40-49 (p=0.014) and 50-60 (p=0.023) had considerably higher PA practice scores than younger age groups. This finding is noteworthy, as it contradicts studies[27,28] that have observed a general decline in

Table V: Participants' mean scores of knowledge, attitude, and practices towards physical activity.

Variables	*n*	Knowledge Score			Attitude Score			Practice Score		
		Mean (SD)	*F* stat[a] / *t* stat[b]	*p*	Mean (SD)	*F* stat[a] / *t* stat[b]	*p*	Mean (SD)	*F* stat[a] / *t* stat[b]	*p*
Age (Years)										
18-29	30	8.63 (1.40)	0.61[a] (3, 190)	0.609	35.77 (2.99)	0.14[a] (3, 97)	0.933	22.30 (3.17)	2.13 [a] (3, 190)	0.097
30-39	65	8.85 (1.11)			35.85 (4.64)			23.35 (3.42)		
40-49	50	8.72 (0.95)			35.34 (4.30)			23.94 (2.90)		
50-60	49	8.57 (1.14)			35.59 (3.21)			23.94 (3.02)		
Gender										
Male	30	8.97 (0.61)	1.35[b] (192)	0.176	37.60 (3.90)	3.00[b] (192)	0.003[c]	23.40 (3.01)	-0.17[b] (192)	0.867
Female	164	8.67 (1.19)			35.28 (3.89)			23.51 (3.22)		
Job Category										
Officer Level	55	8.76 (1.09)	0.40[b] (192)	0.684	36.15 (3.73)	1.12[b] (192)	0.265	22.80 (3.27)	-1.91[b] (192)	0.057
Non-Officer Level	139	8.69 (1.14)			35.44 (4.06)			23.76 (3.12)		
Education										
Secondary	115	8.59 (1.24)	-1.81[b] (192)	0.072	35.46 (4.04)	-0.75[b] (192)	0.452	23.90 (3.04)	2.16[b] (192)	0.032[c]
Higher Education (Diploma & above)	79	8.89 (0.91)			35.90 (3.87)			22.90 (3.31)		
PA Engagement										
Yes	147	8.82 (1.03)	2.16[b] (192)	0.034[c]	35.65 (3.86)	0.09[b] (192)	0.932	23.91 (3.16)	3.35[b] (192)	0.000[c]
No	47	8.36 (1.34)			35.60 (4.35)			22.17 (2.89)		
Mean Score		8.71 (1.12)			35.63 (3.97)			23.49 (3.18)		

in physical activity with increasing age.

Higher-educated librarians in our study showed significantly more knowledge of PA (p=0.046), but they also reported significantly lower PA practice scores (p=0.031). Higher education is associated with both increased awareness and better health habits, which is in contrast to earlier findings among other professional groups, such as healthcare professionals[7]. Common difficulties reported by participants, such as a lack of time (87.05%), poor motivation (76.16%), insufficient workplace support (72.02%), and the absence of incentives (61.14%), may help to explain the inverted direction seen in our study. These barriers might affect those with more professional duties, even though they were not categorised by educational attainment.

Additionally, our study found that PA engagement strongly influenced practice and knowledge outcomes. Librarians who were not physically active performed significantly less well on both knowledge (p=0.009) and practices (p<0.001). The same patterns were found among academic personnel[7], healthcare professionals[24], and hospital-based workers[6], all of whom had high levels of knowledge but inconsistent or poor PA participation.

Although this study was limited to Brunei Darussalam public sector librarians, the findings provide valuable information that may be cautiously generalised to other sedentary professions with comparable organisational structures, including bankers[5], hospital workers[6], academic staff[7], and university employees.[8] Given the comparable nature of sedentary roles, this study may serve as a reference point for developing workplace interventions in similar settings. However, the occupational specificity is still a limitation, and in order to enhance external validity, more research including a range of job sectors is necessary.

CONCLUSION

This study found that knowledge of PA, education level, engagement in PA, gender, and age groups were associated with KAP of PA. Particularly, librarians who were not physically active had significantly lower knowledge and practice scores, while female librarians reported less favourable attitudes toward PA. These results highlight a need for targeted, behaviour-focused workplace interventions that address motivational, structural, and demographic barriers. As the first study in Brunei to examine PA-related KAP in librarians, it contributes new evidence to the limited literature on sedentary ISCO-08 professionals and provides a foundation for future workplace health promotion strategies.

While librarians demonstrated a good level of knowledge about PA, this alone was insufficient to translate into positive attitudes or regular participation in PA. The poor attitudes observed may be attributed to factors such as low motivation, perceived barriers, and lack of self-efficacy, factors known to influence behaviour change in determining PA engagement.[29] These findings highlight the importance of policymakers to implement behaviourally focused interventions that address barriers such as poor attitudes and low motivation among the target population. Future research should consider longitudinal or intervention-based designs and incorporate objective measures such as fitness trackers or pedometer to verify self-report data.

Take Home Message

- Sedentary occupations such as Librarians are at higher risk of NCD.
- This study on physical activity informs librarian patterns relevant to broader ISCO-08 professionals.
- Good knowledge but poor attitudes highlight the need for interventions.
- Observed gender gap highlights need for women-focused, culturally sensitive interventions.
- This study supports Brunei's physical activities Guidelines with local evidence to reduce sedentary government sta behaviours.

Abbreviations

SB	Sedentary behaviour
PI	Physical inactivity
NCDs	Non communicable diseases
WHO	World Health Organisation
PA	Physical activity
KAP	Knowledge, attitudes and practices

Declarations

Conflict of interests

The authors declare no conflict of interests.

Ethical consideration

Ethics approval was obtained from the Pengiran Anak Puteri Rashidah Sa'adatul Bolkiah (PAPRSB) Institute of Health Science Research Ethics Committee (IHSREC) (Reference: UBD/PAPRSBIHSREC/ 2023/76).

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Table VI: Multiple linear regression to identify sociodemographic factors associated with knowledge, attitudes, and practices related to physical activity.

Variables	Knowledge							Attitude							Practice						
	SLR[a]			MLR[b]				SLR[a]			MLR[b]				SLR[a]			MLR[b]			
	b[c]	95% CI	*P*	*Adj. b*[d]	95% CI	*t*-stat.	*P*	*b*[c]	95% CI	*P*	*Adj. b*[d]	95% CI	*t*-stat.	*P*	*b*[c]	95% CI	*P*	*Adj. b*[d]	95% CI	*t*-stat.	*P*
Age (Years)																					
18-29	1							1							1						
30-39	0.21	-0.29, 0.70	0.394	-	-	-	-	0.08	-1.66, 1.82	0.928	-	-	-	-	1.05	-0.32, 2.43	0.131	1.08	-0.24, 3.41	1.62	0.107
40-49	0.09	-0.43, 0.60	0.740	-	-	-	-	-0.43	-2.25, 1.39	0.644	-	-	-	-	1.64	0.20, 3.08	0.025	1.74	0.34, 3.14	2.46	0.014
50-60	-0.06	-0.58, 0.45	0.813	-	-	-	-	-0.17	-2.00, 1.65	0.851	-	-	-	-	1.64	0.20, 3.08	0.026	1.63	0.23, 3.02	2.30	0.023
Gender																					
Male	1		0.177					1			1				1			-	-	-	-
Female	-0.30	-0.74, 0.14		-	-	-	-	-2.32	-3.82, -0.80	0.003	-2.32	(-3.82, -0.80)	-3.00	0.003*	0.11	-1.14, 1.36	0.867	-	-	-	-
Job Positions																					
Officer	1							1							1			1			
Non-Officer	-0.07 (0.43, 0.28)		0.685	-	-	-	-	-0.71	-1.95, 0.54	0.265	-	-	-	-	0.96	-0.03, 1.96	0.057	0.84	-0.11, 1.80	1.730	0.085
Education																					
Secondary education	1			1				1							1			-	-	-	-
High education	0.29	-0.03, 0.62	0.072	0.32	0.01, 0.64	2.01	0.046	0.44	-0.71, 1.58	0.452	-	-	-	-	-0.10	-1.91, -0.09	0.031	-	-	-	-
PA Engagement																					
Yes	1			1				-0.06	-1.37, 1.26	0.932	-	-	-	-	-1.74	-2.77, -0.72	0.000	-	-	-	-
No	-0.46	-0.83, -0.09	0.013	-0.49	-0.85, -0.12	-2.64	0.009*	1		-	-	-	-	-	1			-1.80	-2.81, -0.79	-3.52	0.000*

[a] Simple linear regression
[b] Multiple linear regression (knowledge $R2 = 0.04$; attitude $R2 = 0.04$; practice $R2 = 0.11$); the model reasonably fits well; model assumptions are met; there is no interaction between independent variables, and no multicollinearity problem)
[c] Crude regression coefficient
[d] Adjusted regression coefficient