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ABSTRACT

This study aimed to determine a relationship between religious affiliation, religiosity and health behaviors among high school students in Jakarta, Indonesia. This cross-sectional study was conducted in 9 high schools in Jakarta, Indonesia. A total of 767 respondents joined this study. A multivariate analysis was conducted to determine the associations between dependent and independent variables by adjusting age, sex, school type and economic status. Lower non-organized religious activity had a significant association with higher addictive behaviors (AOR: 0.577 95% CI: 0.340-0.979). In case of nutrition behaviors, there were no significant associations among all aspects of religiosity. Lower organized religious activity was associated with physical inactivity (AOR: 0.323 95% CI: 0.170-0.614). In addition, lower non-organized and intrinsic religiosity had significant association with lower personal hygiene behaviors (AOR= 0.433 95% CI: 0.272-0.688; AOR: 0.436 95% CI: 0.198-0.958). Students with higher religiosity tend to engage less in risky health behaviors. Religious leaders and organizations may be engaged in health promotion activities to disseminate and create better understanding of religious values and beliefs regarding health behaviors.

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1. INTRODUCTION

Religious faith, beliefs, and activities are essential aspects of the lives of adolescents [1-2]. A survey conducted in the United States in 2005 revealed that 27% of respondents claimed to have become more religious, compared to the previous research that only 16% of respondents became less religious [3]. Given the importance of religion in adolescents' lives, a growing body of research has considered associations between young peoples' religiosity and development as significant [4]. Moreover, religion and spirituality play a role in adolescent development, such as health, subjective well-being, education, risk behavior, and civic engagement [2].

Religious doctrines have an impact on health and health behaviors [5]. In terms of substance abuse, religiosity and spirituality have a positive impact on adolescent substance abuse [6-11]. Religion and spirituality also have positive effects on fruit and vegetable intake [12]. Religious beliefs also have a significant influence on active

lifestyle and doing exercise to maintain weight [13]. In addition, in terms of personal hygiene, hand hygiene is practiced in some religions as an activity for hygienic, ritual and symbolic reasons [14].

Religion is an inseparable thing in life for Indonesians [15]. Indonesia adopts monotheistic concept as the nation's philosophy and allows religious freedom of the six officially recognized religions (Catholicism, Protestantism, Hinduism, Buddhism, Confucianism/Kong Hu Cu, and Islam) [16]. With more than 200 million Muslim, Indonesia becomes the world's most populous Muslim-majority country [17]. Based on the 2010 census data, from 230 million residents in Indonesia, 87.6% are Muslims, 6.96% are Christians, 2.91% are Catholics, and the rest are Hindus, Confucianists, and Buddhists [17].

Although almost all Indonesians adhere to religion, religious values and doctrines are likely not adopted by some Indonesian youth because risky health behavior remains a problem among them. Based on the 2015 Global Student Health Survey, 36.1% of youth consume fruit less than a portion per day, 22.0% of male youth are current smokers, 4.4% consume alcohol in the last 30 days and 8.44% are overweight [18]. Another data also revealed that the number of youth smokers in Indonesia has increased from 7.2% in 2013 to 9.1% in 2018 [19].

Several researches performed in Indonesia have identified the role of religion on specific health behaviors. A research conducted in East Java, Indonesia revealed that attending religious services has been significantly associated with active reproductive health behavior in the male youth [20]. Another research using data from the Indonesia Family Life Survey Wave showed that religious involvement has become a protective factor against smoking behavior [21]. A more specific study assessing smoking behavior among street children in Makassar, Indonesia also stated that religiosity has correlation with smoking behavior [22]. One qualitative study has been performed in Bogor, Indonesia showing that religious organizations' pronouncements on smoking have had a small effect on preventing non-smokers to not smoke [23].

Despite several studies in Indonesia investigating the role of religion on specific youth health behaviors, little has been yet done on religiosity and its impact on comprehensive health behaviors. Thus, the purpose of this study is to compare Muslims and non-Muslims on their religiosity and health behaviors and to determine a relationship between religiosity and health behaviors among high school students in Jakarta, Indonesia. Jakarta was chosen as location of the research because Jakarta was a province with high heterogeneity in the term of ethnicity and religion [24]. It is expected to represent various religions as one of the variables in this study. Moreover, various health risky behaviors still exist in Jakarta. Based on Indonesian Basic Health Survey 2018, 97.15% of high school age group in Jakarta was still insufficient for daily intake of fruit and vegetable, 51.20% not washing hand regularly, 19.78% smoking and 63.08% lack of physical activity [25].

2. RESEARCH METHOD

This cross-sectional study was conducted in nine high schools in Jakarta, Indonesia. The schools were chosen using multistage cluster random sampling. Firstly, nine tertiary high schools were randomly selected from the list of schools from the Ministry of Culture and Education. Then, three classes were randomly selected from each school. Finally, all students in the selected classes were recruited as respondents. High school students were chosen as a sample of the research given the condition that adolescents engaged in more risky behavior than adults [26]. Physical and biochemical development together with changes in the social environment play a role in the tendency of adolescents to engage health risky behavior [27]. The data were collected from self-reported questionnaire in September 2018. The minimum sample size (689 respondents) was determined by using the formula of hypothesis testing for two-population proportion (95% Confidence Interval). The actual number of respondents participating in this study was 767.

The data collection process was performed by four trained research assistants. Prior to data collection, the research assistants explained the research aim and procedure to the respondents. All respondents signed a consent form. While the respondents were filling out the questionnaires, teachers were not allowed to attend the session. Institutional permissions were obtained from the schools and an ethical clearance was obtained from the Health Research Ethics Committee of University of Muhammadiyah Prof. Dr. Hamka (No. 03/18.10/019).

The questionnaire consisted of three parts. The first part comprised of questions on socio-demographic variables, the second one contained question regarding religiosity, while the final one consisted of questions to measure health behaviors. Respondent demographics (5 items) identified sex, age, religion, amount of pocket money and school grade of respondents. The question on religion was based on the six aforementioned official religions in Indonesia.

Religiosity was measured by using the Duke University Religion Index (DUREL). The instrument consisted of five items that assessed three major dimensions of religiosity namely organized religious activity (ORA), non-organized religious activity (NORA) and intrinsic (or subjective) religiosity (IR) [28].

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Organizational religious activity (ORA) comprised of public religious activities such as participating religious services and activity (prayer groups, religious studies groups). Non-organizational religious activity (NORA) includes religious activities performed privately such as prayer, watching religious TV/radio and reading holy book. Intrinsic religiosity (IR) measures level of personal religious motivation or commitment [28]. We used direct translation method for translating questionnaire [29]. After the translation, researchers discussed the questionnaire in order to identify if any expressions that still inadequate. The Cronbach's α was then calculated for reliability measurement. The Cronbach's α for religiosity questions was 0.721.

The 2015 Indonesia Global Student Health Survey Questionnaire was adopted in this research to determine health behaviors in students [30]. The questions determine substance use, dietary behavior, physical activity and personal hygiene. Dietary behavior (5 items) determined the consumption of fruit, vegetable, breakfast, soft drink and junk food. Substance use (2 items) measured cigarette and alcohol use in the last 30 days. Cigarette smoker was defined as someone who smoked cigarettes, hand-rolled cigarettes and/or 'kretek' (clove cigarettes). Physical activity (1 item) measured the frequency of physical activity during the past 7 days for a total duration of at least 60 minutes a day. Personal hygiene (4 items) measured the frequency of tooth brushing, hand washing before eating and after using toilet or latrine, and hand washing with soap. Risky health behaviors included addictive behavior, nutrition risk behavior, low personal hygiene and physical inactivity.

The data were analyzed using SPSS Version 21 (IBM Corp, Armonk, NY). Descriptive statistics were employed to describe the demographic status. A chi-square analysis was performed to determine the association of religiosity and health behaviors among Muslims and non-Muslims. A multivariate analysis was conducted to determine associations between religiosity and the four risky health behaviors by adjusting age, gender, financial condition and school ownership.

3. RESULTS AND DISCUSSION

A total of 767 students were recruited as research subjects in the present study. More than half of the respondents (57.8%) were female. Majority of them were 15-17 years old, with the median age of 16. More than three quarters of respondents (76.9%) were Muslims. More than half of respondents (55.1%) had low pocket money (less than IDR 100,000, -or USD 7.12 /week) and studied in private schools that can be seen in Table 1.

Table 1. Sociodemographic characteristics of the respondents

Variables	n	%
Sex		
Male	324	42.2
Female	443	57.8
Age, years		
≤ 15	222	28.9
16	241	31.4
17	242	31.6
≥ 18	62	8.1
Religion		
Muslim	590	76.9
Catholic	40	5.2
Christian	107	14.0
Buddha	28	3.7
Hindu	2	0.3
Pocket money		
Low	423	55.1
High	344	44.9
School ownership		
Private	452	58.9
Public	315	41.1
School region		
South Jakarta	137	17.9
East Jakarta	210	27.4
West Jakarta	211	27.5
Central Jakarta	209	27.2

Students' religiosity is presented in Table 2. From all sample, 23.3% participated at least once a week in organized religious activity, and 39.2% practiced daily private religious activity. Most students (more than 90%) agreed to the presence of the divine, posed religious beliefs as the whole approach to their

life, and carried over the religion to all other dealings in their life. When comparing Islam and other religions, the results showed that about half of Muslim students attended religious meetings while other students of different faiths attended religious meetings once a week. Most of the respondents agree to the three different statements on the intrinsic of subjective religiosity.

Table 2. Religiosity among adolescents in study population

	Total		Muslim		Non-Muslim	
	n	%	n	%	n	%
Attendance of religious meetings (church, temple, mosque)						
Every day	171	22.3	153	25.9	18	10.2
More than once a week	179	23.3	140	23.7	39	22.0
Once a week	124	16.2	69	11.7	55	31.1
A few times a month	140	18.3	113	19.2	27	15.3
A few times a year	101	13.2	81	13.7	20	11.3
Once a year or less	30	3.9	21	3.6	9	5.1
Never	22	2.9	13	2.2	9	5.1
Private religious activity						
More than once a day	152	19.8	139	23.6	13	7.3
Daily	301	39.2	263	44.6	38	21.5
Two or more times a week	119	15.5	88	14.9	31	17.5
Once a week	62	8.1	27	4.6	35	19.8
A few times a month	82	10.7	52	8.8	30	16.9
Rarely or never	51	6.6	21	3.6	30	16.9
Experience the presence of divine						
Definitely true of me	552	72.0	450	76.3	102	57.6
Tends to be true	177	23.1	115	19.5	62	35.0
Unsure	6	0.8	3	0.5	3	1.7
Tends not to be true	13	1.7	9	1.5	4	2.3
Definitely not true	19	2.5	13	2.2	6	3.4
Religious beliefs are really behind my whole approach to life						
Definitely true of me	382	49.8	304	51.5	78	44.1
Tends to be true	338	44.1	256	43.4	82	46.3
Unsure	29	3.8	16	2.7	13	7.3
Tends not to be true	9	1.2	6	1.0	3	1.7
Definitely not true	9	1.2	8	1.4	1	0.6
Carry over my religion to all other dealings in my life						
Definitely true of me	327	42.6	269	45.6	58	32.8
Tends to be true	382	49.8	286	48.5	96	54.2
Unsure	27	3.5	11	1.9	16	9.0
Tends not to be true	19	2.5	16	2.7	3	1.7
Definitely not true	12	1.6	8	1.4	4	0.5

Table 3 shows the differences of religiosity and health behaviors between Muslim and Non-Muslim groups. Non-organized religious activity and intrinsic religiosity had significant association with religions. Mostly, there was no significant association between health behaviors and religions adhered among students. There was no significant association between fruit and vegetable consumption, breakfast habit, junk food consumption, substance use, physical activity, brushing teeth, use soap when washing hand, washing hand after using toilet/latrine and religions adhered. Only soft drink consumption, alcohol consumption, and washing hands before eating had significant association with religion adhered.

Association between religiosity and risk health behaviors was presented in Table 4. After adjusting with age, sex, economic status and school type, organized religious activity and intrinsic religiosity had no association with addictive behaviors. However, lower non-organized religious activity had significant association with addictive risk behaviors. In terms of nutrition risk behavior, there were no significant associations among all aspects of religiosity. Lower organized religious activity is associated with physical inactivity, while non-organized religious activity and intrinsic religiosity were not significantly associated with physical inactivity. Further, lower non-organized religious activity and intrinsic religiosity have significant association with hygiene behavior.

Mainly this study revealed that those who showed higher religiosity (organized, non-organized and intrinsic) were less likely to engage in risky behaviors. Non-organized religious activity such as prayer, meditation and studying the holy book significantly influenced addictive risk behaviors in which lower non-organized religious activity had a significant association with higher addictive risk behaviors. Lower organized religious activity such as attending worship place and religious meetings was associated with physical inactivity. Non-organized religious activity and intrinsic religious activity significantly affected personal hygiene behavior. Yet, all aspects of religiosity were not significantly associated with nutrition behaviors. The result is confirmed by previous studies, which have found a negative association between religiosity

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and sedentary behavior [31] addictive behaviors [6, 8-10] and soft drink consumptions [9]. Other studies have found a positive association between spirituality and religious practice and healthy eating behaviors [12, 32-34]. However, this research revealed that organized, non-organized and intrinsic religiosity were not associated with healthy eating behaviors. Pitel et al stated that religiosity was not associated with no regular fruit consumption, physical inactivity and infrequent tooth brushing [9]. An intervention study identified no relationship between religiosity and change in diet and physical activity [35]. In addictive risk behaviors, organized religious activity and intrinsic religious do not influence students in using cigarette and drinking alcohol. The non-religious organized activity has become a protective factor against cigarette use and drinking alcohol. A study from Byron stated that religious organizations' pronouncements in Indonesia appear to have had a small effect in supporting the position of non-smokers not to smoke [23]. Social environments that accept smoking as everyday activities might become another factor that affected adolescents to smoke, apart from religiosity [36].

Table 3. The numbers and percentages of religiosity aspects and health-related behaviors among Muslim and non-Muslim groups

Variables	Muslim (n=590)	%	Non-Muslim (n=177)	%	p-value
Religiosity					
Organized religious activity					
Low	34	5.8	18	10.2	0.057
Medium	194	32.9	47	26.6	
High	362	61.4	112	63.3	
Non-organized religious activity					
Low	73	12.4	60	33.9	0.000
Medium	115	19.5	66	37.3	
High	402	68.1	51	28.8	
Intrinsic religiosity					
Low	29	4.9	14	7.9	0.006
Medium	242	41.0	91	51.4	
High	319	54.1	72	40.7	
Dietary behavior					
Fruit consumption					
<3 per day	526	89.2	164	92.7	0.174
≥3 per day	64	10.8	13	7.3	
Vegetable consumption					
<3 per day	497	84.2	156	88.1	0.201
≥3 per day	93	15.8	21	11.9	
Break fast					
Never/rarely/occasionally	353	59.8	107	60.5	0.882
Frequently/always	237	40.2	70	39.5	
Soft drink consumption					
≥1 per week	110	18.6	45	25.4	0.049
<1 per week	480	81.4	132	74.6	
Junk food consumption					
≥1 per week	416	70.5	122	68.9	0.687
<1 per week	174	29.5	55	31.1	
Substance use					
Tobacco use					
Yes	106	18.0	35	19.8	0.860
No	484	82.0	142	80.2	
Alcohol consumption					
Yes	59	10.0	33	18.6	0.002
No	531	90.0	144	81.4	
Physical activity					
<3 per week	213	36.1	69	39.0	0.486
≥3 per week	377	63.9	108	61.0	
Personal hygiene					
Brushing teeth					
<1 per day	16	2.7	9	5.1	0.119
≥1 per day	574	97.3	168	94.9	
Washing hands before eating					
Never/rarely/occasionally	220	37.3	90	50.8	0.001
Frequently/always	370	62.7	87	49.2	
Washing hand after using latrine					
Never/rarely/occasionally	126	21.4	50	28.2	0.056
Frequently/always	464	78.6	127	71.8	
Use soap when washing hand					
Never/rarely/occasionally	193	32.7	69	39.0	0.123
Frequently/always	397	67.3	108	61.0	

The doctrine of religions usually encourage people to avoid risky behaviors and promote positive health behaviors to nurture and care for their physical body [5, 37]. An article described Islam-the most religion to adhere in Indonesia-as the religion that promotes healthy lifestyles such as encouraging women to breastfeed infants for up to 30 months, practicing personal hygiene, avoiding intoxicating substance use and excessive eating behaviors [38]. Moreover, religious values can fill the inner emptiness in adolescents so that adolescents can determine their behavior in accordance with norms and religion which are basically contrary to deviant behavior [39].

Table 4. The association between religiosity and health risky behaviors

4	Addictive risk behavior			Nutrition risk behavior		
	n	%	AOR (95% CI)	n	%	AOR (95% CI)
Organized Religious Activity						
Low (1-2)	16/52	30.8	1.000	51/52	98.1	1.000
Medium (3-4)	46/241	19.1	0.905 (0.404-2.026)	223/241	92.5	0.216 (0.028-1.690)
High (4-6)	120/474	25.3	1.082 (0.495-2.363)	427/474	90.1	0.165 (0.021-1.270)
Non-Organized Religious Activity						
Low (1-2)	45/133	33.8	1.000	119/133	89.5	1.000
Medium (3-4)	54/181	29.8	0.939 (0.523-1.688)	166/181	91.7	1.511 (0.683-3.343)
High (5-6)	83/453	18.3	0.577 (0.340-0.979)*	416/453	91.8	1.615 (0.808-3.229)
Intrinsic Religiosity						
Low (3-10)	14/43	32.6	1.000	41/43	95.3	1.000
Medium (11-13)	78/333	23.4	0.858 (0.379-1.939)	308/333	92.5	0.671 (0.150-3.007)
High (14-15)	90/391	23.0	0.921 (0.406- 2.092)	352/391	90.0	0.492 (0.111- 2.176)
Physical inactivity						
	n	%	AOR (95% CI)	n	%	AOR (95% CI)
Organized Religious Activity						
Low (1-2)	33/52	63.5	1.000	39/52	75.0	1.000
Medium (3-4)	95/241	39.4	0.410 (0.213-0.788)**	158/241	65.6	0.813 (0.397-1.665)
High (5-6)	154/474	32.5	0.323 (0.170-0.614)**	253/474	53.4	0.545 (0.273-1.091)
Non-Organized Religious Activity						
Low (1-2)	60/133	45.1	1.000	100/133	75.2	1.000
Medium (3-4)	72/181	39.8	0.939 (0.575-1.532)	108/181	59.7	0.577 (0.345-0.964)*
High (5-6)	150/453	33.1	0.766 (0.493-1.192)	242/453	53.4	0.433 (0.272-0.688)***
Intrinsic Religious Activity						
Low (3-10)	19/43	44.2	1.000	34/43	79.1	1.000
Medium (11-13)	127/333	38.1	0.877 (0.441-1.742)	196/333	58.9	0.441 (0.200-0.971)*
High (14-15)	136/391	34.8	0.801 (0.402-1.594)	220/391	56.3	0.436 (0.198-0.958)*

All models were adjusted by age, sex, pocket money and school ownership. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

In terms of degree (3) religiosity, this research found that more than two-third of the students practiced medium and high organized religious activity, non-organized religious activity and intrinsic religiosity. In spite of practising medium and high religiosity activities, risky behaviors in this research were still considerably high. There is a phenomenon in Indonesia in which religions are seen as merely rituals (e.g. performing prayers) and traditions (e.g. celebrating religious holidays). Some have failed to incorporate religion values and beliefs regarding healthy behaviors which is confirmed by a research performed in Bogor, Indonesia revealing that, generally, people did not comply with religious pronouncements on smoking [23]. However, religion is obviously not the only determinant that influences health behavior. Other determinants such as socioeconomic factors can also shape people behavior [40].

Since more than half of the students performed high organized religious activity, there is an opportunity to convey health education in religious meetings given that religious leaders play a vital role in promoting positive health behaviors [41, 42]. Furthermore, incorporating health promotion activities in religious sites has a significant impact on improving health behavior [43, 44]. In the other side, parents and teachers also should be involved in promoting healthy behavior among adolescents since their involvement was associated to the extent to which adolescents engage an extensive variety of health risky behaviors [45, 46].

This research provided an insight into the degree of religiosity and its association with risky health behaviors. However, further research is needed to identify the extent to which the youth understands religion value and beliefs regarding healthy behavior. Also, there is a need to identify the extent to which the role of religious leaders in promoting health behaviors in their religious speech and activities. It may be worthwhile to perform an intervention study that explores the effectivity of religious leaders and faith-based organization in health promotion activities to improve health behaviors especially in youth setting. This study employed a cross-sectional design, thus the results may not explain the process of behavioral changes completely. In addition, since the respondents were limited to only senior high school students, the findings do not represent the youth in other levels of education. Finally, the religiosity assessment tool used in this study cannot measure religiosity deeply and specifically [28].

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4. CONCLUSION ¹

High school students with higher religiosity tend to engage less in risky health behaviors. This research implies health professionals to involve religious leaders in promoting health behaviors and incorporating religious values and beliefs regarding health behaviors in health promotion activities.

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