

# Mediating Effect of Religious Belief on Death Anxiety in Chinese Adolescents: A Cross-Sectional Study

Grace Ka In Lok<sup>1,2\*</sup>, Milly Wai I Ng<sup>1</sup>, Michelle Min Xia Zhu<sup>1</sup>, Samantha Ka Kei Chao<sup>1</sup>, Shirley Xiang Li<sup>1</sup>

<sup>1</sup>Kiang Wu Nursing College of Macau, Macao SAR, China

<sup>2</sup>Faculty of Health Sciences, University of Macau, Macao SAR, China

\*Corresponding author: Grace K.I. Lok, Kiang Wu Nursing College of Macau, Est. Repouso No. 35, R/C, Macao SAR, China. Tel: +853-85906236; Fax: +853-28365204; Email: lokkain@kwnc.edu.mo

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## Abstract

**Background:** Since death anxiety is a potential risk for adolescent suicide, it is important to identify the related factors for promoting positive life attitudes and suicide prevention in high school students in Macao. For this aim, we assessed the level of death anxiety of the adolescents with Chinese ethnicity and explored its socio-demographic correlations.

**Methods:** A cross-sectional survey was conducted on 2,687 adolescents aged 14 years or above, recruited from ten high schools in Macao during June 2015. A self-administrated questionnaire was distributed to the participants and was completed autonomously and anonymously.

**Results:** Our findings indicated the average death anxiety score of high school adolescents in Macao was within the general norm of 4.5 to 7.0 (6.97, SD=3.13). Female adolescents ( $t=-7.914$ ,  $P<0.001$ ) who studied in senior secondary school ( $t=-3.952$ ,  $P<0.001$ ) had participated in life and death education ( $t=-2.275$ ,  $P=0.023$ ) with religious belief ( $t=-2.451$ ,  $P=0.014$ ) and attended school with religious background ( $t=-3.42$ ,  $P=0.001$ ) reported significant differences in death anxiety. Furthermore, weak mediating effect of religious belief (OR=0.04,  $P=0.042$ ) and school attendance with religious background (OR=0.06,  $P=0.004$ ) were found to be effective in reducing death anxiety in these adolescents.

**Conclusion:** This is the first study to examine death anxiety of Chinese adolescents. Our findings suggest the need to pay attention on the effect of religious belief and cultural considerations for designing life and death education in Chinese adolescents.

**Keywords:** Death anxiety; Adolescents; Chinese

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## 1. Introduction

It is normal that people respond to different levels of anxiety when facing death. Death anxiety is considered to be the reactions of people who are fear of death and dying (1). Death anxiety is described as “the perception of intimidations/hazard to life in day-to-day interactions” (2). Studies on death anxiety date back to the 90s in the United States, followed by European countries, Middle East countries and Asia-Pacific countries. China, which has one of the largest population in the world, embraces different death belief. However, to date, limited attention has been given to explore attitude towards death. Few studies on this topic have been conducted in Hong Kong and Taiwan. These studies showed that death anxiety correlates with gender, age, religious beliefs, psychological conditions and even the family dynamics (3-13). Among the above factors, religion was found to be associated with death anxiety as well as a strong predictor (14). Religion potentially plays a key role in mediating the readiness of people in facing death. On the other hand, some researchers tried to explore the adverse outcome of death

anxiety by studying its relationship with suicide ideation (15). A significant association between death anxiety and suicide potential was found in the adolescents (16).

In 2012, statistics of the World Health Organization (17) reported that young people are at high risk of unnatural death, and the suicide is the second leading cause of death among young people aged 15 to 29 years. In Asia, adolescent suicide rate was about 6.2 per 100,000 for young men and 3.85 for young women in the 2000s (18). In 2015, adolescent suicide issue attracted the attention of the government of Macao under which the Education and Youth Affairs Bureau implemented a life education project in high schools in Macao (19). The project was to promote positive life attitudes and suicide prevention in high school students in Macao SAR. Death is a taboo in Chinese culture like most Chinese people generally view death as misfortune (15, 20). Death topic is even more distant from high school students who are at a lively and energetic stage of life.

Therefore, only few reports revealing death anxiety

or death attitude among elderly and nursing students in Macao (21, 22), causing a lack of former local studies regarding death attitudes of general Macao adolescents that can inform the development of life education activity for this population.

## 2. Objective

In light of the above, the present study was initiated to explore the level of death anxiety of the Macao adolescents with Chinese ethnicity. Another objective is to identify the correlation between socio-demographic characteristics and the level of death anxiety among Chinese adolescents.

## 3. Methods

### 3.1 Participants and Procedures

This study was a cross-sectional survey embedded within a life education project in Macao entitled “Four Seasons of Life”. The primary aim of the project is to disseminate the value of life through providing a greater understanding of death. The study obtained approval from the Research Committee of Kiang Wu Nursing College of Macau, the Education and Youth Affairs Bureau, and the schools for all procedures of the study

with the considerations of its scientific and ethical standards. There were 43 high schools and 30,088 high school students (7<sup>th</sup> graders to 12<sup>th</sup> graders or secondary level of education) in 2014/2015 academic year in Macao SAR (23). In order to guarantee the representativeness of the sample, one-tenth of the high school students who were studying at a quarter of the high schools in Macao to participate in this study. A total of thirteen schools, which included in the “Four Seasons of Life” project were invited. Ten schools of them participated in this study.

In total, 2,877 high school students from ten high schools were recruited consecutively and invited to complete a self-administrated questionnaire anonymously in June 2015. A written and verbal standardized introduction and invitation of the study was given to the students by the coordinating school teacher or research member; the students were free to decline participation without any consequences. Due to sensitive nature of the questionnaire, the coordinating teacher of each school made observations of emotion changes of the students and offered counseling referral if needed. 2,687 out of the 2,877 students returned valid questionnaires, giving a response rate of 93.4%. 1,032 (38.4%) participants were at junior level of high school (7<sup>th</sup> grade to 9<sup>th</sup> grade or junior secondary) and 1,654 (61.6%) were at senior level (10<sup>th</sup> grade to 12<sup>th</sup> grade or senior secondary) (Table 1).

**Table 1:** The association between socio-demographic characteristics with death anxiety in Macao adolescents (N=2687)

	n (%)	*C-T-DAS Scores			Statistics	
		Mean	SD	t	P	
<b>Gender</b>						
Male	1352(50.3)	6.50	3.132	-7.914	<0.001	
Female	1335(49.7)	7.44	3.05			
<b>Grade of study</b>						
Junior secondary	1032(38.4)	6.67	3.139	-3.952	<0.001	
Senior secondary	1654(61.6)	7.16	3.107			
<b>Single child</b>						
No	2156(80.3)	6.97	3.137	-0.185	0.854	
Yes	528(19.7)	6.95	3.089			
<b>Religious belief</b>						
No	2159(80.3)	6.90	3.119	-2.451	0.014	
Yes	528(19.7)	7.27	3.145			
<b>Experiences of other's death</b>						
No	769(28.6)	6.89	3.150	-0.812	0.417	
Yes	1909(71.4)	7.00	3.117			
<b>Participation in life and death education</b>						
No	2132(79.3)	6.90	3.076	-2.275	0.023	
Yes	555(20.7)	7.25	3.304			
<b>School's characteristics</b>						
Non-religious	2343(87.2)	6.89	3.123	-3.42	0.001	
Religious	344(12.8)	7.51	3.110			

\*C-T-DAS: Chinese version of Templer's Death Anxiety Scale

All participating students were aged 14 years old or above; 46.2% of them were in the age group of 16 to 17 years old.

### 3.2 Measures

Since Chinese is the major official language used in Macau, a Chinese self-administered questionnaire was used and it included two sections. Section I collected the socio-demographic data of the participants including age, gender, level of study, sibling, religion, experience of death of families, friends, life and death education received and religious background of attending school. In section II, a Chinese version of Templer's Death Anxiety Scale (C-T-DAS) was used to assess death anxiety of the participants. The original version of Death Anxiety Scale (DAS) was developed in 1960s, it was widely applied to assess the level of death anxiety of different populations. The DAS has been translated and its validity and reliability tested (24). The C-T-DAS consists of 15 items deriving from four dimensions (Death Intrusion, Fatal Illness, Time Anxiety and Death Anxiety Cognition) and the response on each item was on a "Yes" or "No" base. The total score of the scale ranges from 0 to 15 with higher scores indicating higher degree of death anxiety in the respondents. If the total score of C-T-DAS was 7 or more, it is considered as containing high death anxiety, and vice versa. The C-T-DAS has a high test-retest correlation reliability (0.831), internal consistency coefficient ( $\alpha=0.71$ ) and satisfactory cross-cultural validity (25). It took around five to ten minutes to be completed by the students.

### 3.3 Statistical Analysis

The data were analyzed by SPSS version 22.0

for Windows (SPSS Inc., Chicago, IL, USA). The normality of distributions for the continuous variables was checked by one-sample Kolmogorov-Smirnov test. Independent sample t-tests and one way ANOVA were performed to compare the C-T-DAS scores with the socio-demographic characteristics of the participants. Multiple linear regression analysis with the "Enter" method was used to determine the demographic variables influencing the death anxiety level of the high school students in Macao. The score of C-T-DAS and its domains was the dependent variable, whereas independent variables included all variables that showed significant correlations with the C-T-DAS and its domains in univariate analyses. Two-tailed tests were adopted in all analyses at the significance level of 0.05.

## 4. Results

Of 2,687 respondents, 50.3% were male. The majority of them were agnostic ( $n=2159$ , 80.3%) and 71.4% experienced death of family members or friends. The vast majority (79.3%) of the participants has never attended any life and death education activity. The average score of C-T-DAS of all participants was 6.97 ( $SD=3.13$ ) and 45.3% of them scored 7 and above. Table 1 presented the means, standard deviation and t-test statistics for death anxiety scores by socio-demographic characteristics of the participants. Significant differences were indicated in gender ( $t=-7914$ ,  $P<0.001$ ), level of study ( $t=-3952$ ,  $P<0.001$ ), school's characteristics ( $t=-3.42$ ,  $P=0.001$ ), religious belief ( $t=-2.451$ ,  $P=0.014$ ), participation of life and death education ( $t=-2.275$ ,  $P=0.023$ ) and different age groups ( $F=2.772$ ,  $P=0.026$ ).

**Table 2:** Multiple linear regression models for independent socio-demographic with scores of Death Anxiety Scale and its domains (N=2687)

	C-T-DAS*			Domains of C-T-DAS											
	$\beta$	SE	P	DI**			FI**			TA**			DAC**		
	$\beta$	SE	P	$\beta$	SE	P	$\beta$	SE	P	$\beta$	SE	P	$\beta$	SE	P
Age (years)	0.03	0.06	0.54	0.02	0.03	0.439	0.03	0.02	0.448	0.01	0.02	0.925	0.00	0.02	0.823
Female	0.15	0.12	<0.001	0.15	0.06	<0.001	0.17	0.05	<0.001	-0.04	0.03	0.067	0.11	0.04	<0.001
Grade of study	0.05	0.17	0.027	-0.00	0.08	0.937	0.07	0.07	0.003	0.06	0.04	0.015	0.02	0.06	0.234
Single Child	-0.01	0.15	0.969	-0.01	0.07	0.494	-0.01	0.06	0.842	0.01	0.04	0.654	0.01	0.05	0.454
Religious belief	0.04	0.15	0.042	0.02	0.07	0.269	0.03	0.06	0.123	0.05	0.04	0.024	0.02	0.05	0.284
Experiences of other's death	0.00	0.13	0.851	-0.03	0.06	0.150	0.01	0.05	0.720	0.01	0.03	0.698	0.04	0.04	0.057
Participation in life and death education	0.03	0.15	0.040	0.02	0.07	0.223	0.02	0.06	0.197	0.00	0.04	0.793	0.05	0.05	0.004
Attending school with religious background	0.06	0.18	0.004	0.02	0.08	0.423	0.06	0.07	0.002	0.04	0.05	0.070	0.05	0.06	0.014

$\beta$ : Standardized regression coefficient; SE: Standardized Error; \*C-T-DAS=Chinese version of Templer's Death Anxiety Scale; \*\*DI: Death Intrusion; \*\*FI: Fatal Illness; \*\*TA: Time Anxiety; \*\*DAC: Death Anxiety Cognition

In Table 2, the Enter Multiple linear regression indicated that being female (OR=0.15,  $P<0.001$ ), having religious belief (OR=0.04,  $P=0.042$ ) and attending a religious school (OR=0.06,  $P=0.004$ ) significantly predicted higher level of death anxiety, after controlling for other key background characteristics. Furthermore, feminine, level of study, religious belief, participation in life and death education activity, and the school's characteristic were significantly related to the domains of C-T-DAS. Especially for those female adolescents who are attending school with religious background were weak mediating predictors within the domains of Death Intrusion (Female: OR=0.15,  $P<0.001$ ), Fatal illness (Female: OR=0.17,  $P<0.001$ ; Attending school with religious background: OR=0.06,  $P=0.002$ ), and Death Anxiety Cognition (Female: OR=0.11,  $P<0.001$ ; Attending school with religious background: OR=0.05,  $P=0.014$ ).

## 5. Discussions

The main finding of this study is that the average death anxiety score of high school adolescents in Macao was within the general norm of 4.5 to 7.0 ( $SD>3.0$ ) (26) and below the youth norm of 7.5 ( $SD=3.61$ ) (27). The score was apparently higher than that of the elderly in a previous local study (22), and was also slightly higher than the study conducted earlier in Western context (16). T-tests and correlation tests revealed that the degree of death anxiety among 2,687 Chinese adolescents was significantly associated with gender, age, and level of study and these results were consistent with studies in both Chinese (7, 20, 22) and in Western context (6, 11, 28). The results showed a slight tendency that participants who had never received life and death education reported higher death anxiety. However, the duration and content of the education varied and were too diverse to focus more specifically on the complex relationship between life and death education and death anxiety. This study also indicated a positive association between death anxiety and age, so did death anxiety and level of study. However, it was somewhat contrary to that of the previous adolescent studies, which showed a negative association (6, 7). Therefore, gender, age (including level of study), and religion are the three factors that showed significant association with the level of death anxiety of the participants.

### 5.1 Death Anxiety and Gender

Gender was often found to be a discriminant factor in the level of death anxiety among people of all ages (9, 20, 29). Female adolescents tended to be more anxious regarding death than male ones (7, 11, 20). This was shown in the factors associated with fear of dying

process, fear of the dead, fear of death of others, fear of consciously experiencing death, and fear of premature death (7). Wong's findings (9) explained that female adolescents were significantly more superstitious than male ones and superstition was a reliable predictor of death anxiety. Other researchers considered that the higher death anxiety among female adolescents may not be unique to death-related issues, but may simply reflect their greater tendency to express negative experiences and intense feelings (30). Assuming that both of these factors are also embedded in the Chinese female adolescents, it would support our regression findings that gender is a main predictor of death anxiety in this group. In terms of clinical implications, our finding suggests that it may be beneficial to adopt different therapeutic approaches for female and male adolescents when implementing death education.

### 5.2 Death Anxiety and Age

It was found that the characteristics of DAS had very little relationship between death anxiety score from middle to late adolescents (31). Intriguingly, our findings indicated that older adolescents tended to report higher level of death anxiety than the younger counterparts. This finding is contrary to previous studies on death anxiety in Chinese adolescents (7, 20). One possible explanation is that the range of the participants' ages was rather narrow, that was between 14 to around 18 years old. Another possible explanation is that the association was especially seen between age and the factors of fatal illness and time anxiety of death anxiety score. This may imply that the older the adolescents, the higher capacity of cognitive abstract and logical thinking they develop and the more attention they give to the threats of fatal illness and closeness to death. Since the oldest adolescent group of the samples may have reached 18 at time of assessment, this is a critical stage for them to shift from dependent adolescents to independent adults; maturation could possibly make them to think more about life issues, including sickness, dying, and death. Russac and colleagues' study (6) showed that people in their 20s reported higher death anxiety than the group of 19 years old or younger. His explanation was that those aged 20 has reached the height of their reproductivity, at this time were expressing anxiety toward death, they were concerned with threats that their death would have on bearing and raising offspring. This explanation aligns with the viewpoint of emotional and behavioral psychologists, supports the trans-diagnostic constructs of psychopathology of death anxiety as well as corresponds to the Terror Management theory that

views death anxiety as a basic fear underlying human development (i.e. when one grows older, one might be more aware of the truth of death) (32). Further studies should explore the perceptions, feelings, and attitudes toward life and death of both the younger and older Chinese adolescents.

### 5.3 *Death Anxiety and Religion*

One area of great interest in this study was that religious belief and attending school with religious backgrounds were significant but weak predictors of death anxiety. Indeed, those who reported having religious belief and attending school with a religious background tended to report more death anxiety. Previous research pointed out that religious belief has a stronger association with one's death anxiety level than with his/her religious practice (33). Such a distinction between religious belief and religious practice brought out the concept of religiosity. Wen (28) deemed that highly religious people are believed to possess intrinsic religious motivation and that they seek to internalize their religious beliefs as their central value and live out those beliefs in their daily lives. She explained that a strong belief system is likely to form one's perception of increased control and predictability, which lessens his fear of death.

Evidence also indicated that there is an inverse relationship between religiousness and death anxiety, while a positive relationship exists between religious doubt and death anxiety (14). Furthermore, a curvilinear and linear trend was found in the relationship between religiosity and death anxiety. People reporting intermediate levels of religiosity showed a higher death anxiety than those reporting highly religious and non-religious (28). These findings, on one hand, showed that having religion may reduce death anxiety when it is accompanied by a high degree of commitment. On the other hand, this may help to explain our findings that Macao adolescents who reported having religious belief or studied in schools with religious background may be at intermediate levels of religiosity or at the state of religious doubt, resulting in higher death anxiety. Taken together the findings of absent association between religion and death anxiety in the Macao elderly (22), the role of religion in mediating the readiness of the Macao Chinese in facing with death was not as promising as indicated in the West. This provides an important and critical message to the religious bodies, as well as the schools with religious background.

Nevertheless, religion served as a protective

mechanism for people's physical and psychological health as religious attitudes made people tolerate mundane difficulties more easily (34). Apart from religion, personal characteristic may also be influential in reducing death anxiety. For instance, humility was believed to be able to buffer death anxiety (35).

No matter what approach is taken, either through religion or self-cultivation of humility, there seems to be ways to minimize the level of death anxiety of people. To understand the factors associated with the level of death anxiety provides a useful step to inform the contents and focus of such value-fostering process for adolescents.

### **Limitations**

Despite the large sample size, the results of this study should be interpreted with caution due to several methodological limitations. First, the results should not be generalized to all adolescents of Macao because the samples of this study were the participants of the life education project held by the Education and Youth Affairs Bureau of Macao in 10 high schools and were not selected by random. Second, individual variation in prerequisite exposure to life and death education and suicidal ideation among the participants were not explored, and they may be important attributes to the death anxiety of the Chinese adolescents. Third, the participants were merely asked whether they have religion or not in the questionnaire used, and they did not have to specify which religion they believed in. Therefore, follow-up study in examining the distribution of religion and the level of religiosity among the Macao adolescents and the association with their death anxiety is needed.

### **Conclusion**

It is noteworthy that death anxiety studies have increasingly been concerned in the Chinese context in the past decade, even so, only few studies were published in this topic area. This is the first study that indicates the level of death anxiety of Chinese adolescents and reveals the relationship between their death anxiety and gender, age and religion, and the weak mediating effect of religious belief in reducing death anxiety among Chinese adolescents. Results provide reference to religious education and highlight the importance of cultivating positive death attitude and personal value among adolescents in order to prevent adolescent suicidal ideation. Since the death anxiety of Macao adolescents was comparatively high in the city and its

strong predictors were not identified, further unknown factors are believed to attribute to this in addition to gender and age factors. To develop culture-tailored and comprehensive life and death education for Chinese adolescents, further exploration of the relationship between death anxiety and their socio-demographic and clinical characteristics, including but not exclusively self-esteem, health perception, self-efficacy and suicidal risk is warranted.

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### Conflict of Interest

The authors declared no conflict of interest.

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