Heritability of Aging Male Symptoms (AMS) in Filipino Males

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Abstract: The prevalence of Aging Male Symptoms (AMS) has raised the concern of medical practitioners, as this has greatly influenced the quality of life of aging males. Debates about its method of treatment have been going on between medical practitioners in most medical societies. However, there are little medical records on the prevalence of AMS in the Philippines, and it is unknown if the lifestyle greatly affects the expression of the syndrome. The study was therefore conducted to determine the heritability and frequency occurrence of AMS among Filipino men. Eighty eight families (88 fathers and 128 sons) were surveyed for this study. The Aging Males Symptoms (AMS) Questionnaire was used to determine the severity of impairment of every individual for each clinical subscale (somatic, psychological and sexual subscales). The frequency for every level of impairment was determined. A significant relationship between the percentages and severity of impairment was observed for the sexual subscales; sexual-related symptoms are largely age related. Variable percentages for both somatic and psychological subscales indicate that AMS is heritable and is largely due to environmental factors than genetic factors, and that sexual-related factors largely contribute to its heritability. Symptoms such as joint pains and muscular aches, physical exhaustion or lacking vitality, decrease in muscular strength, irritability, decrease in beard growth, decrease in ability or frequency to perform sexually, decrease in morning erections, and decrease in sexual desire or libido may significantly characterize the onset of AMS and may be used to determine the severity of impairment for AMS.

Key words: Aging Males Syndrome, heritability, sexual subscale.

INTRODUCTION

Aging male symptoms (AMS), also known as male menopause or andropause, is considered a medical condition experienced by man when they reach the age of 35 to 65 due to a substantial decrease in testosterone level in the blood (Marcy, 2010). Some medical practitioners defined it as a manifestation of testosterone deficiency along with accompanying symptoms that may affect the quality of life of men (Horie, 2006), or a persistent condition of hormone deficiency associated with ageing, which could and should be remedied by testosterone treatment (Watkins, 2007). Male menopause symptoms includes psychological: irritability, diminishing motivation and memory; somatic: lack of strength and vigor, reduced muscle mass and bone density; and sexual factors: lack of interest in sex and diminishing libido, erectile dysfunction and decrease in frequency of morning erections (Cavalieri and Ginsberg, 2008). An individual may also exhibit other symptoms such as difficulty in sleeping, frequent urination, inability to focus, hair loss, and osteoporosis (Marcy, 2010).

There have been relatively many studies popularizing and addressing the issues of AMS. However, almost none of these studies were conducted in the Philippines. Most Filipinos, especially men, are constantly bombarded with the stress of daily living. Most sources of stress are from around work, mainly livelihood; farmers toiling and worrying about their crops during drought or storms to simple pedicab drivers struggling for their daily needs. Another source of stress is from the expectations of obligation to members of extended families. Furthermore, Filipino men are expected to hold in their emotions with respect with their masculinity and pride, elevating their stress to even higher levels (Tan, 2006). Filipinos often expressed stress through recurring headaches, abdominal pains, nausea and fatigue, some of these which are symptoms of AMS (Tan, 2006). However, only a few of these Filipinos consult doctors for check-ups, leaving us with very little record of the actual medical condition of these men.

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While the symptoms of AMS remained relatively constant, their diagnosis and treatment varies greatly over time (Watkins, 2008). Proper diagnosis of the syndrome remains difficult because its clinical manifestations are nonspecific, subtle, and not clearly defined (Horie, 2006). Due to this there have been considerable debates as to how this syndrome should be treated. Also, possible external factors within every culture varies, which may also affect the expression of the syndrome.

Most of the members of high class medical professionals pronounced that male menopause should be treated as a serious medical condition (Watkins, 2007). Some, however, deduced that the symptoms for male menopause are just side-effects of anxiety caused by the stresses of modern life (Watkins, 2008). Some countries have already taken the initial steps in realizing that the aging process may lead to health problems and have given the necessary attention to the matter, but are confused on how to specifically treat it (Moore, 2006). Since decrease in testosterone level may be caused by other external factors such as drugs, illnesses and stress related factors (Moore, 2006), the onset of AMS may vary between cultures, and the stresses of modern Filipino life may contribute significantly to its expression. Hence, a study was conducted on the heritability of AMS among selected Filipino men to determine if AMS is largely genetic or heavily influenced by external factors related to the lifestyle of Filipino culture. The study was to determine if AMS is largely age-related.

MATERIALS AND METHODS

Gathering of Data:

A survey was conducted to evaluate the frequency occurrence of AMS. Survey method was used since it is the most inexpensive method available. Stratified random sampling was used. The Aging Male Symptoms (AMS) questionnaire developed by the Berlin Center for Epidemiology and Health Research was used (Heinemann, 2008). The AMS questionnaire was used because it has already passed several reliability tests and has good test characteristics to determine health related quality of life (HRQoL) related symptoms of AMS. The questionnaire was designed to assess symptoms pertaining to AMS which are independent from those disease related among males of different age groups (Daig, 2003). The questionnaire was also designed to determine the severity of the symptoms over time (Daig, 2003), a useful property when evaluating the heritability of symptoms among fathers and their respective sons. The AMS questionnaire is made up of 17 questions, each pertaining to a particular symptom of AMS. Each question pertains to a particular subscale: somatic (decline in your feeling of general well-being, joint pain and muscular ache, excessive sweating, sleep problems, increased need for sleep, physical exhaustion or lacking vitality, and decrease in muscular strength); psychological (irritability, nervousness, anxiety, depressive mood and feeling burnt out); and sexual (feeling that you have passed your peak, decrease in beard growth, decrease in ability or frequency to perform sexually, decrease in number of morning erections and decrease in sexual desire or libido). For each of the 17 questions, an option is provided to check one of the 5 degrees of severity (1-none, 2-mild, 3-moderate, 4-severe, 5-extremely severe). The questionnaires were given to fathers and their respective sons in Pagadian City and Iligan City. Eighty-eight respondent families were collected from both areas, with the fathers' ages ranging from 36-64 years old and the sons' age ranging from 13-30 years old. Basis for selection was that the surveyed son of each family should be 13 years and older.

Tabulation of Data:

The collected was tabulated. The raw scores for the fathers and their respective sons for all 17 questions were tallied. The linear relationship between the scores of the fathers with their respective sons for every question was determined using the Paleontological Statistics (PAST) program. The r and p-value were obtained and presented in table form. A p-value of ≤ 0.05 would signify a significant relationship (Torres-Reyna, 2011) between the scores of the fathers and their sons. This is to determine which among the symptoms in AMS questionnaire can be considered significant.

Using the scoring scheme of the AMS questionnaire (Heinemann, 2008) the subscale scores and sum scores for every individual were obtained and tallied.

Descriptive Statistics:

A frequency distribution was conducted to obtain the different age groups of the total surveyed population. Using the AMS norm values (Heinemann, 2008), the severity of impairment for every subscale was determined for every surveyed individual. The norms values for the somatic (-8 – no, 9-12 – little, 13-18 – moderate, 19+ - severe), psychological (-5 – no, 6-8 – little, 9-11 – moderate, 12+ severe) and sexual (-5 – no, 6-7 – little, 8-10 – moderate, 11+ - severe) subscales determine the level of impairment.

A total cut-off score of 27 points was used. A total score greater than or equal to 27 points is considered abnormal and at risk of having AMS (Clapauch, 2008). The frequency of occurrence for every level of severity was obtained for the fathers, sons, and the total population, separately. This was done to assess if the symptoms presented in the AMS questionnaire highly attributes to AMS, or if this symptoms may be associated to other external factors. Also, the frequency of occurrence for every level of severity among different age groups was obtained.

Statistical Analysis:

The concordance for the level of impairment between the fathers and their sons were obtained. This was done to determine if the different symptoms of AMS are age-related and if there is a genetic factor in the expression of the syndrome.

The correlation between the age groups and the different levels of impairment was obtained using a Contingency Table (Paleontological Statistics Software was used) to determine if the symptoms of AMS are largely age related.

A factorial analysis using Multivariate CABFAC factor analysis (PAST) was used to determine which among the symptoms presented in the questionnaire would significantly describe AMS and which may be used to describe the severity of the impairment.

RESULTS AND DISCUSSION

A total of 88 families were surveyed for the study. There were a total of 88 fathers and 128 sons surveyed, giving a total of 216 individuals.

The norm values for the AMS questionnaire (Heinemann, 2008) were used to determine the frequency of individuals for every level of impairment per subscale, with a cut-off score of 27 points for the total sum score.

At the cut-off score of 27 points, 87.5% of the total father's population proves at risks of having AMS. 38.64% and 36.36% of the fathers has little and moderate impairment, respectively (Table 1). A large percentage of the total father's population (52.27%) showed severe impairment with regards with sexual-related factors, and only 5.68% of the population has no sexual-related impairment. It was observed that there is a direct relationship between the levels of impairment and that of the percentage of the total fathers' population for the sexual subscale; as the severity of impairment increases, the percentage of fathers also increases. These sexual impairments may be characterized by decrease in sexual desire or libido. Only a small percentage of the population (psychological: 5.68%; somatic: 8.41%) showed no impairment.

In the psychological subscale, 94.32% of the fathers' population showed psychological related impairments, ranging from little to moderate impairment. These impairments may be manifested through depressive moods, nervousness and irritability. On the other hand, 96.59% of the fathers' population showed somatic related impairments, again ranging from little to severe levels. These may be manifested through excessive sweating and sleep problems. No other significant patterns or relationships can be observed for both somatic and psychological subscales.

Table 1: Distribution of the Total Population of Fathers in every level of Impairment.

Subscale	Impairment	N	Percent of Population (%)
Psychological	No	5	5.68
	Little	30	34.09
	Moderate	23	26.14
	Severe	30	34.09
Somatic	No	3	3.41
	Little	19	21.59
	Moderate	50	56.82
	Severe	16	18.18
Sexual	No	5	5.68
	Little	12	13.64
	moderate	25	28.41
	Severe	46	52.27
Total Sum Score	No	11	12.5
	Little	34	38.64
	moderate	32	36.36
	Severe	11	12.50

Number of fathers who answered the questionnaire, *N* = 88. *n*=number of individuals per category.

For the total son's population, only 58.6% has a score more than 27 points, which means that the sons' age group are relatively at less risk of having AMS than that of the fathers (Table 2). Fifty three of the sons (41.41% ; N=128) showed no impairment for AMS, while 37.50% (n = 48) of the same population showed no impairment for sexual-related factors. As the severity of impairment increases, there is a decrease in the observed percentage. Again, the somatic and psychological related impairments may be manifested through excessive sweating and sleep problems, irritability, nervousness and depressive moods. There are still no apparent relationships and patterns observed for that of both somatic and psychological subscales.

Table 2: Distribution of the Total Population of Sons in every level of Impairment.

Subscale	Impairment	N	Percent of the Population (%)
Psychological	No	12	9.38
	Little	53	41.41
	Moderate	35	27.34
	Severe	28	21.88
Somatic	No	19	14.84
	Little	42	32.81
	Moderate	50	39.06
	Severe	17	13.28
Sexual	No	48	37.50
	Little	32	25.00
	Moderate	28	21.88
	Severe	20	15.63
Total Sum Score	No	53	41.41
	Little	47	36.72
	moderate	23	17.97
	severe	5	3.91

Number of sons who answered the questionnaire, $N = 128$. n=number of individuals per category Among the total population of surveyed males, 70.37% of the total surveyed population proved at risk of having AMS (Table 3). No apparent relationships or patterns were observed for all subscales and for the total sum score for the total population of both fathers and sons. The highest percentage observed was 46.30% of moderate impairment for the somatic subscale. However, this does not prove significant, as this may be caused by other factors aside from that of AMS. Environmental factors play a role in the male aging process (http://www.essortment.com/aging-aging-affects-fertility-men-35702.html)

Table 3: Distribution of the Total Population of Males (Fathers and Sons) in every level of Impairment.

Subscale	Impairment	n	Percent of Population
Psychological	No	17	7.87
	Little	83	38.43
	Moderate	58	26.85
	Severe	58	26.85
Somatic	No	22	10.19
	Little	61	28.24
	Moderate	100	46.30
	Severe	33	15.28
Sexual	No	53	24.54
	Little	44	20.37
	Moderate	53	24.54
	Severe	66	30.56
Total Sum Score	No	64	29.63
	Little	81	37.50
	Moderate	55	25.46
	Severe	16	7.41

Number of males who answered the questionnaire, $N = 216$. n=number of individuals per category.

Significant association in the scores of the fathers and sons were observed in the following symptoms: (1) excessive sweating (2) sleep problems (3) irritability (4) nervousness (5) depressive moods and (6) decrease in sexual desire/libido. A significant association (p=0.0103; Table 4) was observed in the symptom regarding sleep problems. Some sleeping disorders, such as familial advance sleep-phase syndrome (FAPS), follow a simple Mendelian inheritance pattern (Ptáček, 2009). However, the basis of other sleeping disorders are not yet known, such as advanced sleep-phase syndrome (ASPS), which is more commonly observed in aging individuals (Ptáček, 2009). Thus, sleep problems can be greatly attributed to genetic factors which are inherited in a similar fashion as eye color, etc.

A very high significant association among the scores was observed for irritability and depressive moods (both with p= 0.0006). This coincides with a study that was conducted in Philadelphia on the genetic and environmental influences on irritability among males, which showed 37% significant heritability, with variances attributed to environmental influences (Bergeman, 1997). Also, depressive mood expressed through loss of appetite and other physiological functions more likely has a heritable basis (Janga, 2004), than other depression symptoms.

A high significant association (p=0.0007) observed for decrease in sexual desire or libido, indicates a high heritable basis and may hint at the possible occurrence of erectile dysfunction. In a similar study conducted on Brazilian men, an affirmative answer to the question regarding decrease of sexual desire or libido strongly correlates with low levels of calculated free testosterone (Clapauch, 2008).

However, it was observed that the r values for all associations were very small. This may indicate that the observed symptoms may be highly attributed to other environmental factors. (http://www.essortment.com/aging-aging-affects-fertility-men-35702.html)

Table 4: Heritability of AMS symptoms.

| SYMPTOMS	R	P	REMARKS
1. Decline in your feeling of general well-being.	0.1535	0.0916	not significant
2. Joint pain and muscular ache.	0.0822	0.3732	not significant
3. Excessive sweating.	0.2736	0.0022	Significant
4. Sleep Problems	0.2256	0.0103	Significant
5. Increased need for sleep, often feeling tired	0.1147	0.1973	not significant
6. Irritability	0.2987	0.0006	Significant
7. Nervousness	0.2295	0.0096	Significant
8. Anxiety	0.0870	0.3362	not significant
9. Physical Exhaustion/ lacking vitality	0.0601	0.5210	not significant
10. Decrease in muscular strength	0.0970	0.2895	not significant
11. Depressive mood	0.3087	0.0006	Significant
12. Feeling that you have passed your peak	-0.0196	0.8342	not significant
13. Feeling burnt out, having hit rock-bottom	0.1652	0.0759	not significant
14. Decrease in beard growth	0.1617	0.0700	not significant
15. Decrease in ability/ frequency to perform sexually	0.1758	0.0515	not significant
16. Decrease in number of morning erections	0.1632	0.0688	not significant
17. Decrease in sexual desire/libido	0.3004	0.0007	Significant

The apparent variability and lack of pattern in the percentages in both the somatic and psychological subscale show that these factors may not be solely attributed to the presence of AMS. These symptoms, such as decline in feeling of general well being, excessive sweating and sleep problems, nervousness, irritability, anxiety, and the like, are highly subjective for every respondent and may be attributed to other environmental and external factors aside from the presence of AMS.

Most men of over 50 years of age with osteoporosis present high risks of being diagnosed with Late Onset Hypogonadism (Clapauch *et. al.,* 2008).

However, there are still notable similarities between the percentages of both sexual and the total sum scores for both fathers and sons, even though there are no apparent similarities between the other subscales. This apparently implies that the subscales are not independent of each other, which shows a significant hereditary factor in the sexual aspects (Daig, 2003).

When the percentages of both fathers and sons were compared for the sexual subscale, an inverse relationship was observed between the percentages of the fathers and that of the sons (Figure 1). There is an evident increase in the percentage among fathers as severity of impairment increases, while at the same time there is a notable decrease in the percentage among sons.

Thus, it can be concluded that the sexual symptoms for AMS are largely age-related, and thus AMS therefore exist. In a cohort study of Brazilian men of over 50 years old with osteoporosis, the symptom that best correlates with late onset hypogonadism was that of decrease in sexual desire or libido (Clapauch *et al.,* 2008), while a study conducted on a population of 50 Malaysian men, it was found out that the AMS score is directly related to the presence of erectile dysfunction and hypogonadism (Bernie, 2007). There is then an apparent strong heritable basis for the sexual symptoms of AMS.
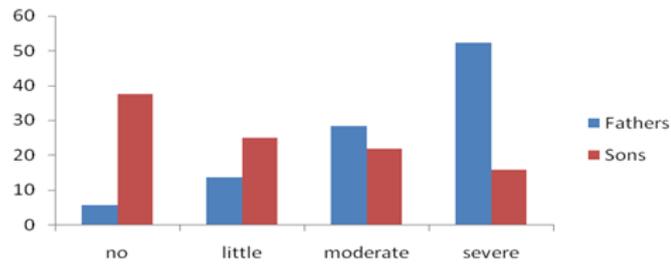
Fig. 1: Comparison for the distribution of fathers and sons in every level of sexual-related impairment.

Low concordance values were observed for the different subscales, with the highest concordance value of 37.50% for the psychological subscale, and the lowest concordance value of 26.56% for the sexual subscale (Table 5). This low concordance for the sexual subscale further substantiate that the sexual symptoms for AMS is largely age-related and is not evident among the younger age groups.

Table 5: Concordance between the severity of Impairment between fathers and their sons with corresponding percentage.

Impairment	Somatic	Psychological	Sexual	Total
no	0 (0%)	2 (1.56%)	4 (3.13%)	10 (7.81%)
little	12 (9.38%)	18 (14.06%)	9 (7.03%)	20 (15.63%)
moderate	29 (22.66%)	14 (10.94%)	6 (4.69%)	8 (6.25%)
severe	5 (3.91%)	14 (10.94%)	15 (11.72%)	2 (1.56%)
TOTAL	46 (35.94%)	48 (37.5%)	34 (26.56%)	40 (31.25%)

Number of father-son pairs, N = 128

As AMS is a complex behavioral trait, influenced by external and environmental factors, the phenotypic expression of the syndrome can be largely attributed to external and environmental factors such as stress and modern practices of present times than genetic factors. As phenotypic expression is represented by the following statistical model (Heritability, 2010):

Phenotype (P) = Genotype (G) + Environment (E);

We can say that the heritability of AMS is heavily influenced by external factors. In the local concept, these external factors may be the stresses that most Filipino men are experiencing, especially during the economic difficulties of the country (Tan, 2006).

There is a significant association observed between the levels of severity with the age groups in the sexual subscale, further substantiating that it is only the sexual symptoms which are largely age-related (Table 6). It seems that the AMS score may be directly related to sexual related impairment (Bernie, 2007). The observed significant association in the total sum score may be largely attributed to the high correlation in the sexual subscale.

Table 6: Correlation between male age groups with different levels of impairment.

| SUBSCALE	CRAMER'S V	CONTINGENCY CHI	P-VALUE	REMARKS
Somatic	0.153	0.293	0.145	no association
Psychological	0.134	0.258	0.527	no association
Sexual	0.19	0.355	0.001	significant association
Total Sum Score	0.187	0.351	0.002	significant association

A factorial analysis between the individual questions and the scores for each question was conducted to determine which of the symptoms determine the level of impairment for AMS. A factorial analysis was conducted for the somatic, psychological, and sexual subscale questions.

High variability were observed for questions number 2, 9 and 10, which corresponds to joint pain and muscle ache, physical exhaustion or lacking vitality, and decrease in muscular strength, respectively (Figure 2). This signifies that these symptoms may describe the physical aspect of AMS, and that it may determine the severity of the occurrence of AMS among males.
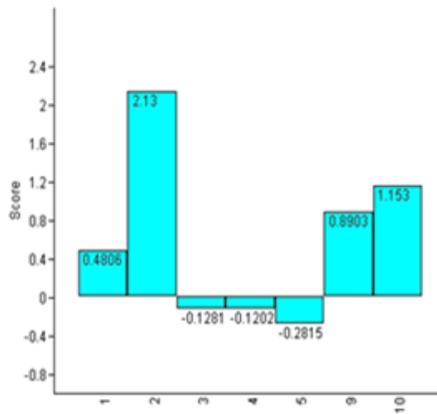
Fig. 2: Variability of Somatic symptoms (Legend: 1: Decline in your feeling of general well being 2: Joint pain and muscular ache 3: Excessive sweating 4: Sleep problems 5: Increased need for sleep, often feeling tired 9: Physical exhaustion/lacking vitality 10: Decrease in muscular strength)

High variability was observed only for questions number 6, which corresponds to irritability (Figure 3). This may signify that irritability strongly describes the occurrence and severity of AMS in the psychological attribute.
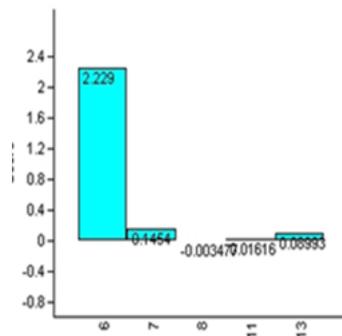
Fig. 3: Variability in Psychological Symptoms (Legend: 6: Irritability 7: Nervousness 8: Anxiety 11: Depressive mood 13: Feeling burnt out, having hit rock bottom)

High variability were observed for questions number 14, 15, 16 and 17, which correspond to decrease in beard growth, decrease in ability or frequency to perform sexually, decrease in number of morning erections, and decrease in sexual desire or libido, respectively (Figure 4). This may signify that these symptoms may describe the sexual attribute of AMS and may be used to describe the level of severity of AMS.
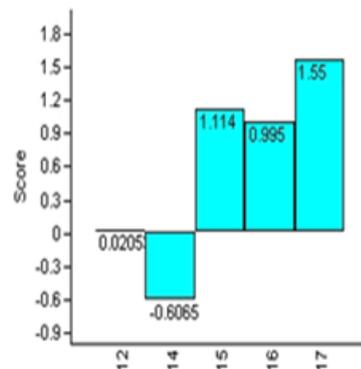
Fig. 4: Variability in Sexual Symptoms (Legend: 12: Feeling that you have passed your peak, 14: Decrease in beard growth, 15: Decrease in ability/ frequency to perform sexually, 16: Decrease in number of morning erections 17: Decrease in sexual desire/libido)

To further substantiate that these symptoms present a significant criteria in describing the severity of AMS, a contingency chi test was conducted. The frequency of answers for every level of severity for every significant question was obtained and was tabulated. A significant difference was observed for the following subscales: somatic (joint pain and muscle pain, physical exhaustion or lacking vitality and decrease in muscular strength), psychological (irritability) and sexual (decrease in beard growth, decrease ability/ frequency to perform sexually, decrease in number of morning erections, and decrease in sexual desire or libido) (Table 7).

A study conducted on 494 twins suggested that joint pains are not influenced by genetic factors, but rather by environmental factors, which are unique to each individual and which determines the variance of a given population (Michalowicz BS, *et. al.*, 2000). A significant dominance effect was also observed for beard growth among males in a twin study on pubertal development (Mustanski, B. *et. al.*, 2004). Thus, the following symptoms can be an important indicator of the severity of the presence of AMS.

Table 7: Frequency of Individuals who Answered in Every Level of Impairment for Each Significant Question.

		None	Mild	Moderate	Severe	Extremely Severe
		2. Joint Pain and Muscle Ache				
	None	19 (86.0%)	3 (14.0%)	0 (0%)	0 (0%)	0 (0%)
	Little	35 (57.3%)	22 (36.1%)	4 (6.6%)	0 (0%)	0 (0%)
	Moderate	17 (17.2%)	50 (50.5%)	27 (27.3%)	0 (0%)	0 (0%)
	Severe	3 (8.8%)	6 (17.6%)	15 (44.1%)	8 (23.5%)	2 (5.9%)
		9. Physical Exhaustion/Lacking Vitality				
	None	19 (86.4%)	3 (13.6%)	0 (0%)	0 (0%)	0 (0%)
	Little	34 (55.7%)	23 (37.7%)	4 (6.6%)	0 (0%)	0 (0%)
	Moderate	14 (14.1%)	52 (52.5%)	32 (32.3%)	1 (1.0%)	0 (0%)
	Severe	5 (14.7%)	7 (20.6%)	9 (26.5%)	11 (32.4%)	2 (5.9%)
		10. Decrease in Muscular Strength				
	None	2 (9.1%)	20 (90.9%)	0 (0%)	0 (0%)	0 (0%)
	Little	36 (59.0%)	25 (40.9%)	0 (0%)	0 (0%)	0 (0%)
	Moderate	14 (14.1%)	63 (63.6%)	20 (20.2%)	1 (1.0%)	1 (1.0%)
	Severe	6 (17.6%)	9 (26.5%)	10 (29.4%)	8 (1.0%)	0 (0%)
		6. Irritability				
	None	17 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Little	35 (42.4%)	38 (45.8%)	10 (12.0%)	0 (0%)	0 (0%)
	Moderate	4 (6.8%)	34 (57.6%)	18 (30.5%)	3 (5.1%)	0 (0%)
	Severe	0 (0%)	14 (24.6%)	22 (38.6%)	15 (26.3%)	6 (10.5%)
		14. Decrease in beard growth				
	None	53 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Little	35 (79.5%)	9 (20.5%)	0 (0%)	0 (0%)	0 (0%)
	Moderate	24 (44.4%)	27 (5.0%)	2 (3.7%)	1 (1.9%)	0 (0%)
	Severe	9 (13.8%)	24 (36.9%)	22 (33.8%)	8 (12.3%)	2 (3.1%)
		15. Decrease in ability/frequency to perform sexually				
	None	53 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Little	37 (84.1%)	6 (13.6%)	1 (2.3%)	0 (0%)	0 (0%)
	Moderate	15 (27.8%)	37 (68.5%)	2 (3.7%)	0 (0%)	0 (0%)
	Severe	4 (6.2%)	17 (26.2%)	35 (53.8%)	6 (9.2%)	3 (4.6%)
		16. Decrease in number of morning erections				
	None	53 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Little	34 (77.3%)	10 (22.7%)	0 (0%)	0 (0%)	0 (0%)
	Moderate	14 (25.9%)	32 (59.3%)	8 (14.9%)	0 (0%)	0 (0%)
	Severe	1 (1.5%)	24 (36.9%)	34 (52.3%)	4 (6.2%)	2 (3.1%)
		17. Decrease in sexual desire/libido				
	None	53 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Little	37 (84.1%)	6 (13.6%)	1 (2.3%)	0 (0%)	0 (0%)
	Moderate	15 (27.8%)	36 (66.7%)	3 (5.5%)	0 (0%)	0 (0%)
	Severe	2 (3.1%)	19 (29.2%)	29 (44.6%)	12 (18.5%)	3 (4.6%)

It was observed that all eight (8) questions were found to be significant in the contingency chi test (Table 8). This further substantiates that the following symptoms can be used to determine the severity of impairment of AMS, especially among Filipino males.

Table 8: Contingency chi test on significant symptoms obtained from factorial analysis.

		CONTINGENCY			
SUBSCALE	SYMPTOMS	CRAMER'S V	CHI	P-VALUE	REMARKS
Somatic	2	0.407	0.576	2.06E-17	significant
	9	0.454	0.618	1.13E-22	significant
	10	0.404	0.574	3.75E-17	significant
Psychological	6	0.476	0.636	2.73E-25	significant
Sexual	14	0.457	0.620	5.80E-24	significant
	15	0.566	0.700	1.05E-37	significant
	16	0.541	0.670	3.43E-31	significant
	17	0.563	0.698	2.21E-37	significant

Conclusion:

The variability of the percentages for both the somatic and psychological subscales and the low concordance values between the scores of the fathers and their respective sons establishes the heritability of AMS that is more heavily attributed to environmental factors than that of genetic factors. The lifestyle, then, that is adapted by the family would influence their QoL and may prevent the onset of AMS related symptoms.

High frequencies of fathers are at risk of having AMS, establishing the high possibility of its occurrence among middle aged men in the locality of Pagadian and Iligan City. Heritability of AMS is more evident in the expression of its sexual symptoms, which is largely age-related.

Joint pains and muscular aches, physical exhaustion or lacking vitality, decrease in muscular strength, irritability, decrease in beard growth, decrease in ability or frequency to perform sexually, decrease in morning erections, and decrease in sexual desire or libido may significantly characterize the onset of AMS and may be used to determine the severity of impairment for AMS.

It is highly recommended for further related studies that the total surveyed sample of the population be increased for a more specific representation of the local population. Also, a comparison with the respondents' actual free testosterone level count with the AMS results would further substantiate the heritability of AMS.

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