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Original Research

The Impact of a Web-Based Educational Initiative in Malang Regency: Enhancing Late Onset Hypogonadism (LOH) Awareness Through Community Service

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Abstract

Late Onset Hypogonadism (LOH), commonly known as andropause, poses significant hormonal challenges for elderly men, impacting their overall quality of life. With testosterone levels naturally declining from the age of 30 and accelerating beyond 40, this hormonal imbalance can manifest in symptoms that degrade the well-being of men. This study aimed to assess the effectiveness of a web-based intervention utilizing the Andropause Screening application, which includes educational videos and the ADAM questionnaire, in understanding and early detection of LOH among Indonesian aging male population. Pre- and post-tests were conducted as success indicators, involving 40 male participants aged 40 and above in Malang Regency. Statistical analyses were performed to assess the impact on knowledge related to andropause across different educational backgrounds and age groups. A 70% increase in public understanding of LOH was observed (from 10 to 38 participants) with high statistical significance ($p<0.001$). Educational backgrounds, categorized into basic, middle, and high education levels, showed no significant associations with initial knowledge ($p=0.100$, mean score differences of 41.42, 61.25, and 59.44, respectively) or the increase in pre-to-post-test scores ($p=0.100$, mean score differences of 47.03, 44.28, and 48.3, respectively). Similarly, when analyzing age groups (40-50 years old, 51-60 years old, and >60 years old), no statistically significant associations were found with initial knowledge ($p=0.308$, mean score differences of 42.85, 26.25, and 36.11, respectively) or the increase in pre-to-post-test scores ($p=0.308$, mean score differences of 36.29, 44.28, and 28.33, respectively). The observed substantial improvement in LOH understanding highlights the efficacy of our educational approach irrespective of educational background and age. However, the oldest age group exhibited the least responsiveness to our educational media.

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1. Introduction

Late-onset hypogonadism (LOH) is a medical condition prevalent among elderly individuals, characterized by serum testosterone levels falling below the norm for healthy young males, accompanied by symptoms indicative of testosterone deficiency. The prevalence of low testosterone and associated symptoms in men aged 40-79 ranges from 2-6%.[1] The initiation of LOH is influenced by a myriad of factors, encompassing non-modifiable elements like age and modifiable ones such as smoking, nutritional status, lifestyle, stress, and underlying medical conditions.[2–4] LOH does not exhibit pathognomonic symptoms; however, typical presentations include erectile dysfunction, diminished sexual activity and libido, weakened muscle strength, gynecomastia, and a reduction in testicular volume. Aspects like decreased motivation, concentration, memory, heightened susceptibility to depression, and insomnia are also commonly noted in individuals with LOH.[2,4–8]

The decrease in serum testosterone typically initiates around the age of 30 and undergoes a more pronounced decline post the age of 40, giving rise to clinical manifestations including sexual dysfunction, diminished libido, cognitive impairment, and diminished physical strength.[9] These complaints often cause anxiety in men who are unsure where to seek treatment. Early detection is crucial in managing LOH, and one early detection modality is the Androgen Deficiency in the Aging Male (ADAM) questionnaire. ADAM is acknowledged as the most efficacious questionnaire for evaluating males with testosterone deficiency, having undergone validation.[10] This research converts the ADAM questionnaire into a web-based application compatible with diverse operating systems (Android, IOS, and Windows). will provide an understandable explanation of LOH for the public, an ADAM questionnaire checklist, interpretation of questionnaire results, and the location of health facilities to visit if LOH is suspected. The objective is to expedite the diagnosis of LOH, ensuring timely and precise therapeutic interventions and, consequently, augmenting the overall quality of life for patients.[9]

The research aims to determine whether there is a positive and significant impact by educating men above 40 years of age in Malang regency about LOH through the web-based application "Skrining Andropause".

2. Methods

This research was conducted in the period August-September 2023 and carried out in several different areas in Malang Regency, East Java, Indonesia. This research aims to determine the increase in the level of public knowledge, especially men over 40 years of age, where this age is the age at which LOH begins to occur. In this study, the data inclusion criteria used were data from men aged 40 years and over who were willing to be interviewed and could communicate well during the intervention.

The intervention encompassed a comprehensive educational program on LOH contain a series of activities involving pre-tests, educational sessions, completion of the Androgen Deficiency in the Aging Male (ADAM) questionnaire, and post-tests.

Upon commencement, participants provided general information, including personal details, age group, highest level of education, marital status, income, and smoking habits, before proceeding to the pre-test. Following the pre-test, participants accessed the open web-based application, "*Skrining Andropause*." This interactive platform initiated the educational session on LOH, beginning with an informative video addressing andropause and hormonal changes in the male body, analogous to menopause in women. The primary aim of this video was to encourage users to undertake the ADAM questionnaire.

After watching the opening video, participants completed the ADAM questionnaire, followed by additional educational content and, if needed, verbal explanations regarding the screening results. The intervention concluded with a closing video emphasizing the importance of testosterone hormones for men and elucidating their functions within the male body. This video further detailed signs and symptoms indicative of low testosterone levels. The ultimate goal of the closing video was to motivate individuals who had completed the ADAM questionnaire to consult a doctor for further assessment of their potential susceptibility to LOH. Ethical clearance for this research was obtained from Ethical Commission Faculty of Medicine Universitas Brawijaya with approval number 71/UN10.F08.10/PN/2023, ensuring that the study adheres to ethical standards and guidelines.

These intervention data then subjected to statistical analysis using descriptive analysis and the Pearson Chi-Square test. Descriptive analysis

was used to see the distribution of age groups, education levels, marital status and income of the respondents interviewed. Then the Pearson Chi-Square test was used to determine the relationship between the respondent's initial knowledge seen from the pretest score and the relationship between the increase of score to the respondent's educational history and age group.

3. Results

Table 1. Characteristics of the Research Subject

Characteristics	Frequency (n)	Percentage (%)
Age Group		
40-50 years	27	67,5%
50-60 years	7	17,5%
>60 years	6	15%
Recent Education		
Basic education (Elementary School)	8	20%
Middle education (Middle & Highschool)	14	35%
High education (College)	18	45%
Marital Status		
Unmarried/Divorce	8	20%
Married	32	80%
Income		
< IDR 1.000.000	13	32,5%
IDR 1.000.000-2.500.000	12	30%
> IDR 2.500.000	15	37,5%
Total	40	100%

Table 2. Changes in Pretest and Posttest Score Percentage After Andropause Education

Score	Pretest (n)	Posttest (n)	Percentage Change
<60	30	2	+70%
≥60	10	38	

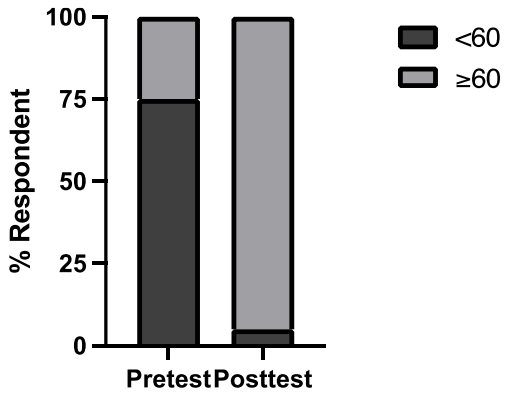

Figure 1. Percentage of Respondent Score

Table 3. Test of Normality and Significance of Changes in Pretest Posttest Scores

Stastitical Test	Result (p)	Intepretation
Saphiro-wilk	p (0,047)	Abnormal (p<0,05)
Wilcoxon	p (0,000)	Significant (p<0,05)

Table 4. Mean of Pretest Scores to Recent Education and Age Group

Recent Education	Mean	Wilcoxon
Basic education	41,42	
Middle education	61,25	p (0,100)
High education	59,44	
Age Group		
40-50 years	57,03	
51-60 years	44,28	p (0,308)
>60 years	48,3	

Table 5. Pretest Posttest Difference to Recent Education and Age Group

Recent Education	Mean	Wilcoxon
Basic education	42,85	
Middle education	26,25	p (0,100)
High education	36,11	
Age Group		
40-50 years	36,29	
51-60 years	44,28	p (0,308)
>60 years	28,33	

The data obtained came from 40 respondents. The data from this research was carried out in pairs (pre-test and post-test) with educational intervention using andropause educational videos and verbal explanations by educational material providers. The data is then analyzed to determine the relationship between variables. The characteristics of research subjects are general data from research respondents who were included in the data analysis including pre-test and post-test scores, age group, last educational history, age at marriage, and income group. Based on table 1, it was found that in this study there were various characteristics based on the data collected, namely age group, recent educational history, marital status, and respondent's income. In the age group, most data came from the 40–50-year age group with 27 respondents (67.5%). Furthermore, in the latest educational history data, the largest number of respondents came from the higher education group, namely 18 respondents (45%). Regarding marital status, most respondents were men who were married or had previously been married with a total of 32 respondents (80%). Furthermore, in income data, the largest number of respondents with 15 respondents came from the income group of more than IDR 2,500,000 (37.5%).

Based on table 2 and figure 1, it was found that there was an increase in the percentage of 70%, which can be seen from the increase in the number of pretest scores ≥60 from 10 respondents to 38 respondents. Based on table 3, data analysis was then continued using the Wilcoxon test and a p value of 0.000 was obtained, indicating that there was a significant change in the pretest and posttest scores.

The pretest data was used as a benchmark for the respondent's initial understanding of andropause, then the Pearson Chi-Square test was carried out to determine the relationship with the respondent's age group and recent educational history. Based on table 4, a Pearson Chi-Square test was carried out and a p value of 0.100 and 0.308 was obtained, which shows that there is no significant relationship between the respondent's initial understanding to the respondent’s recent education and age group respectively.

The success of andropause education can be seen from the increase in the pretest and posttest percentages in the previous discussion. A Pearson Chi-Square test was carried out between the difference in the addition of pretest and posttest scores by age group and the respondent's last educational history. Based on table 5, a Pearson Chi-Square test was carried out and a p value of 0.100 and 0.308 was obtained, which shows that there is no significant relationship between the respondent's initial understanding to the respondent’s recent education and age group respectively.

4. Discussion

In the past decade, there has been a surge in research on men's health. However, in Indonesia, public awareness of men's health remains largely concentrated in major cities. Biological changes in the aging process of men have only recently

become a relatively new issue, triggering diverse responses. Studies on Late-Onset Hypogonadism (LOH) in Indonesia are also relatively scarce.[5,8,9] Unexpected challenges were encountered during the execution of the community service project in Malang regency. Many target subjects expressed rejection, both explicitly through verbal refusal and subtly by citing busyness. Notably, this rejection emerged after our team provided a brief description of LOH and the screening objectives.

Our research results, especially pre-test score, depict that most men above 40 years old have relatively low awareness. This finding, though, does not correlate with age and educational background. Even though it is supported by previous research findings,[9,11,12] further exploration is warranted. In terms of age groups, overall, there is relatively uniform LOH awareness. However, the younger age group (40-50 year of age group) has the highest average scores. Similar patterns are observed in the correlation analysis of LOH awareness with educational backgrounds. Despite having relatively similar scores, respondents with a basic education background (the lowest educational stratum in Indonesia) have the lowest scores.

Despite this somewhat disheartening scenario, there is a glimmer of hope. In our study, subjects in Malang regency proved highly responsive to the educational modalities we provided. Education on LOH plays a significant role in enhancing the knowledge of target subjects, as reflected in our research results. With the andropause screening application modality equipped with easily accessible videos through gadgets, there was a 68% increase in pretest scores. This result aligns with previous research.[9,13]

We delved deeper into this increase in pretest scores to gain insights into the efficacy of our educational modalities. While the increase in pretest scores did not differ among age groups or educational backgrounds, our data indicate that our educational modality brings about a dramatic improvement in respondents with a basic education background, a group previously mentioned to have the lowest average pretest scores. This result is encouraging, as our educational modality appears to be beneficial for this educational background group, although in other outcomes, the oldest age group (age group over 60 years) unsurprisingly exhibited the lowest response in score improvement. While there were two respondents with scores below 60, their outcomes can be reasonably acknowledged, given that both individuals possess a basic education background. Our analysis suggests that educational background in the Indonesian context could influence knowledge assimilation and comprehension, as evidenced by the post-test results. This observation aligns with findings in comparable studies.[9,13]

5. Conclusion

Men's health, particularly concerning Late-Onset Hypogonadism (LOH), is a sensitive issue requiring prompt intervention. Education, with a primary focus on raising awareness, stands as a key component in addressing LOH in Indonesia. The utilization of technology to enhance the effectiveness of education presents a viable option.[13] The implementation of technology-driven educational training over an extended period is anticipated to elevate the knowledge and skills of the elderly in assessing perceived andropause symptoms.[14]

Author's Contribution

All authors have contributed to the final manuscript. The contribution of each author as follow: collected the data, drafted the manuscript and designed the figures, devised the main conceptual ideas and critical revision of the article. All authors discussed the results and contributed to the final manuscript.

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Conflict of Interest

No potential conflict of interest was reported by the authors.

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Ethics Approval

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