

Evaluation of Herbal Remedies (Cocoa & Shea Butter, Vitamin E, Calendula Oils) for Stretch Mark Treatment and Student Survey Insights

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ABSTRACT

This study aimed to investigate the effectiveness of herbal treatments for stretch marks by conducting a detailed literature review and a survey to assess the knowledge and perceptions of pharmacy students. This research aimed to address the gaps in understanding and attitudes about stretch marks and their treatment options. A total of 40 first-year pharmacy students participated in the survey, which consisted of two parts: one focused on knowledge and the other on opinions, alongside demographic information. Statistical analyses, including descriptive statistics and chi-square tests using SPSS software, were used to examine significant patterns. Of the participants, 75% were female, with 90% falling within the 18–30 years age range. The knowledge-based survey revealed a strong understanding of stretch marks among the respondents. Nearly all (97%) were aware that stretch marks develop due to rapid changes in body size. About 80% considered stretch marks as a form of scarring, and two-thirds knew that they could cause itching and irritation. However, there were some misconceptions, such as the belief that stretch marks only occur during pregnancy. Regarding the opinion-based section, students shared differing views on stretch marks and the use of herbal treatments. The analysis revealed a significant association between demographic variables and participants' understanding of stretch marks. Overall, the results provide valuable insights into students' views on managing stretch marks and highlight the need for further research and educational initiatives in dermatology.

Keywords: Perceptions, Stretch marks, Herbals, Striae distensae, Knowledge, Opinions

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Introduction

Stretch marks, scientifically known as striae distensae, are a type of scarring that results from rapid stretching or shrinking of the skin. According to the American Academy of Dermatology (AAD), this sudden change in skin size causes the underlying collagen and elastin fibers to break [1]. The process is thought to involve elastase enzymes released by mast cells and macrophages, which lead to alterations in the collagen and fibrillin structures [2]. Stretch marks can occur due to various factors, including growth spurts, pregnancy, rapid weight changes, and muscle growth [1]. Other contributing factors include hormonal fluctuations, chronic use of topical corticosteroids, family history, and certain autoimmune conditions [1]. These marks are highly prevalent, affecting up to 88% of pregnant women, and similar rates are seen during puberty [2]. Although stretch marks are not physically harmful, they can lead to emotional distress and insecurity in those who experience them, potentially diminishing quality of life (QOL) [3]. The AAD notes that treatments such as tretinoin, retinol, and hyaluronic acid can effectively reduce the visibility of early-stage stretch marks [1]. Dermatological procedures like chemical peels, laser treatments, microdermabrasion, radiofrequency, and ultrasound also help reduce their appearance, though none can eliminate stretch marks. It is crucial to note that topical treatments like tretinoin are contraindicated during pregnancy and breastfeeding due to potential teratogenic effects, thus requiring alternative therapies for these populations [4].

Herbal remedies have long been utilized for various health concerns, with numerous clinical trials assessing their potential in reducing the severity of stretch marks, particularly in pregnant women. This study investigates the effectiveness of herbal treatments such as cocoa butter, shea butter, vitamin E oil, and calendula oil for managing stretch marks. Additionally, a survey was conducted to gauge pharmacy students' knowledge and opinions on these treatments, comparing their views with existing literature on the topic.

Review of herbal remedies for stretch marks

Cocoa butter

Cocoa butter, derived from cacao plant beans, is widely known for its skin-moisturizing properties and its benefits in treating eczema and preventing premature aging [5]. Hague and Bayat conducted a systematic review evaluating various treatments for stretch marks, including cocoa butter, and found that it did not significantly prevent striae distensae in the trials studied [6]. Other research also failed to demonstrate substantial benefits of cocoa butter as a preventive treatment for stretch marks compared to a placebo [6, 7].

Shea butter

Shea butter, a solid fat at room temperature obtained from shea tree nuts, contains fatty acids, vitamin E, and vitamin A [8]. Lin *et al.* [9] found that shea butter exhibited anti-inflammatory and antioxidant effects when applied topically but showed no significant impact on wound healing, skin aging, or skin cancer.

Vitamin E

Vitamin E is an antioxidant known for its ability to protect skin cells and provide moisture [10]. While some studies suggested that olive oil, rich in vitamin E, could prevent stretch marks, trials did not show conclusive benefits [6]. Similarly, a comparison between almond oil and olive oil for preventing stretch marks during pregnancy indicated that neither oil was effective in reducing the severity [6].

Calendula oil

Calendula oil, extracted from the marigold flower, contains lutein and beta-carotene, which contribute to its antioxidant, antimicrobial, and anti-inflammatory properties [11]. Akhtar *et al.* [12] conducted a study comparing calendula oil with a placebo, observing significant improvements in skin hydration and firmness in participants who used calendula over eight weeks.

Opinions and perceptions of herbal treatments

A review of herbal literature highlighted the scarcity of studies exploring healthcare professionals' views on herbal remedies for stretch marks. One such study conducted in Iran surveyed 650 physicians to assess their knowledge, attitudes, and practices regarding herbal treatments. The results showed a low level of herbal knowledge among physicians, with an average score of 6.47 out of 25, though they held a generally positive attitude toward herbal remedies [13]. Another survey by Brennan *et al.* [14] targeted 753 pregnant women at 36 weeks of gestation, revealing that 78% of respondents used products to prevent or reduce stretch marks, with 61% opting for Bio-oil. A study by Karhade *et al.* [3] investigated how stretch marks impacted women's quality of life, with 75% of participants considering the permanency of stretch marks a significant physical concern. Nearly 70% rated their stretch marks as moderate to severe, with 40% feeling self-conscious about their appearance. Additionally, a study by Zhu *et al.* [15] examined consumer preferences for stretch mark treatments and found that 63.6% of products reviewed were specifically marketed for stretch marks, with vitamin E, shea butter, cocoa butter, and Centella asiatica being the most common ingredients.

Study purpose, gaps, and significance

This study set out to address two main objectives: first, to assess existing literature on the effectiveness of herbal treatments for stretch marks, and second, to evaluate pharmacy students' knowledge and opinions about these treatments. Given the limited research on healthcare professionals' awareness of stretch mark treatments and herbal options, this study fills an important gap in the literature. Stretch marks affect a large segment of the population and can significantly impact emotional well-being. While they are generally permanent, various treatments can alleviate their appearance and related discomfort. Given that retail pharmacists are often the first

point of contact for patients seeking treatment advice, it is essential for them to understand patients' perceptions and to be equipped with knowledge on treatment options for stretch marks [1].

Materials and Methods

The survey was part of a required 2-credit Drug Information course for first-year pharmacy students at Howard University College of Pharmacy. In this course, students learned about research methodologies and how to administer surveys. They were assigned topics and tasked with creating an introduction and two distinct sets of questions. One set included five knowledge-oriented questions, while the other contained five opinion-based questions. These questions were compiled into an online survey, with students invited to participate. SPSS software version 29.0 was used for data analysis, applying descriptive statistics to summarize the frequency of responses. To assess statistical significance, Chi-square tests and symmetric measures (interval by interval) were employed, with the Pearson R asymptotic standard error used to compare responses across various demographic, educational, and work-related categories.

Results and Discussion

The results were based on responses from 40 first-year pharmacy students, focusing on their understanding and views regarding stretch marks and the use of herbal remedies. The demographic details are shown in **Table 1**, which indicates that the majority of participants were female, aged between 18 and 30 years. More than half (56%) were from the DMV (District of Columbia, Maryland, and Virginia) area, while the rest came from various other states.

Table 1. Demographic data of the participants (n = 40)

Demographic characteristics	Breakdown of demographic characteristics	N (%)
Gender	Male	10 (25%)
	Female	30 (75%)
Age (Years)	18 to 30	36 (90%)
	> 30	4 (10%)
State that you have lived before coming to the Howard Pharmacy Program.	District of Columbia/Maryland/Virginia	22 (56.4%)
	Other states	17 (43.6%)

Table 2 provides an overview of the work experiences and educational qualifications of the survey respondents. A majority of the participants (two-thirds) reported having more than three years of professional experience, with half indicating that their experience was related to pharmacy. Furthermore, more than 80% of the students reported holding at least a bachelor's degree or a higher level of education before enrolling in the College of Pharmacy.

Table 2. Employment and educational history of survey respondents (n = 40)

Survey Question	Answers	N (%)
How many years of work experience did you have before entering the pharmacy program at Howard?	No work experience or 2 years or less	14 (35%)
	3 or more years of work experience	26 (65%)
What type of work experience have you had?	Pharmacy-related	20 (52.6%)
	Healthcare-related but not pharmacy	9 (23.7%)
	Non-healthcare-related	9 (23.7%)
What is the highest level of education you completed before starting the pharmacy program at Howard?	Pre-pharmacy or associate degree	7 (17.5%)

Table 3 presents the results of the opinion-based questions answered by the participants. A comparison between the students' views and the findings from the literature reveals both agreement in some areas and differences in others.

For instance, the majority of students (80.6%) align with the literature, acknowledging that stretch marks initially appear as colored lesions, often purple, red, or pink, due to the underlying blood vessels. Furthermore, there is a

strong agreement between students (91.7%) and the literature regarding the existence of various types of stretch marks, including reddish or purple (*striae rubrae*) and white or silvery (*striae albae*), which might differ based on individual factors.

However, differences emerge concerning the belief that stretch marks might fade away on their own without treatment. While 44.4% of students hold this belief, the literature contradicts it, stating that although some marks may diminish in appearance, they typically don't disappear entirely without treatment.

Additionally, students are divided on whether stretch marks should be classified as a medical condition, with nearly an even split between those who agree and those who disagree. The literature, however, categorizes stretch marks not as a medical disease, but as a form of scarring resulting from rapid skin expansion.

When it comes to recommending home remedies such as cocoa butter, shea butter, vitamin E oil, and calendula oil for treating stretch marks, students are also split. While 44.4% of students do not endorse these treatments due to perceived lack of effectiveness, the literature acknowledges that, despite varying outcomes, there is anecdotal evidence supporting their potential benefits in improving the appearance of stretch marks.

Table 3. The results of the opinion-based questions (n = 36)

Question	Strongly disagree/ Disagree n (%)	Strongly agree/ Agree n (%)	Evidence from the literature search
Stretch marks typically appear in color when they first appear on the skin.	7 (19.4%)	29 (80.6%)	Agree: Initially, stretch marks tend to be red, purple, or pink due to visible blood vessels, with the color fading to lighter shades as they heal. This change is part of the mark's natural maturing process.
There are different types of stretch marks.	3 (8.3)	33 (91.7)	Agree: Stretch marks primarily include two categories: <i>striae rubrae</i> (red or purple marks) and <i>striae albae</i> (white or silvery marks), with variations in appearance based on skin type and genetic factors.
Stretch marks are expected to fade away on their own over time, even without treatment.	16 (44.4%)	20 (55.6%)	Disagree: Though some stretch marks may diminish over time, they rarely disappear entirely without medical intervention.
Stretch marks are considered a medical condition.	17 (47.2%)	19 (52.8%)	Disagree: Stretch marks are not classified as a disease but are instead a form of scarring caused by rapid skin stretching, often linked to pregnancy, puberty, or weight fluctuations.
I would not suggest using home remedies such as cocoa butter, shea butter, vitamin E oil, or calendula oil for stretch marks, as they tend to be ineffective.	16 (44.4%)	20 (55.6%)	Disagree: While outcomes may differ from person to person, certain home treatments like cocoa butter, shea butter, vitamin E oil, and calendula oil have shown anecdotal support for reducing the appearance of stretch marks, though their effectiveness is not guaranteed.

Table 4 presents the combined outcomes from the knowledge-based questions answered by survey participants. The data reveal that most participants demonstrated a strong grasp of key information regarding stretch marks. A significant portion of the participants accurately identified important aspects, such as the connection between stretch marks and rapid weight changes (97% correct responses), their classification as a form of scarring (80% correct responses), and the potential for stretch marks to cause discomfort like itching (two-thirds correct responses). However, there were some misunderstandings, with just over half of the respondents mistakenly believing that stretch marks only develop due to pregnancy and that they appear more often on a person's hands. The overall average of correct responses across all knowledge-based questions was 72.18%, reflecting a moderate level of comprehension among the survey group.

Table 4. The results of the knowledge-based questions (n = 36)

Question	Correct answer	True n (%)	False n (%)	Participants with correct answers n (%)
Rapid weight fluctuations or changes are commonly associated with the appearance of stretch marks on the skin.	True	35 (97.2%)	1 (2.8%)	35 (97.2%)
Stretch marks are exclusively caused by pregnancy	False	15 (41.7%)	21 (52.5%)	21 (52.5%)
Stretch marks are more commonly found on the hands of individuals.	False	16 (44.4%)	20 (55.6%)	20 (55.6%)
Stretch marks are classified as a form of scarring.	True	29 (80.6%)	7 (19.4%)	29 (80.6%)
Stretch marks are sometimes known to cause irritation and itching.	True	27 (75.0%)	9 (25.0%)	27 (75.0%)
Overall score (n (%))				36 (72.18%)

Table 5 illustrates the significant statistical relationship observed when evaluating responses to the opinion-based questions. A clear link was found between participants' educational backgrounds and their understanding of dermatological concepts, particularly concerning the different types of stretch marks. Those with a Bachelor's or higher-level degree, such as BSc, BA, or MA, were more likely to strongly agree or agree with the statement "There is more than one type of stretch mark." This suggests that individuals with advanced education may have a more comprehensive understanding of dermatological topics related to stretch marks.

Table 5. Comparison of responses to opinion-based questions concerning the participants' demographics, educational background, and work experience (n = 36).

Question: There is more than one type of stretch mark vs. the highest educational level.			
Comparator	Strongly disagree/ Disagree n (%)	Strongly agree/Agree n (%)	Pearson's R asymptotic standard error
• Pre-pharmacy or an associate degree	0 (0%)	5 (13.9%)	0.044
• BSc/BA/MA/MSc or higher education	3 (8.3%)	28 (77.8%)	

The analysis presented in **Table 6** reveals that a range of demographic factors affect people's knowledge of stretch marks. Younger individuals, particularly those between 18 and 30 years old, tend to have a better understanding of stretch mark causes compared to older groups, suggesting a generational shift in awareness. Additionally, participants working in pharmacy-related roles show a more extensive understanding of stretch marks than those in non-pharmacy or non-healthcare professions, indicating that professional exposure contributes to knowledge acquisition. Higher levels of education are also linked to a better grasp of stretch marks, underscoring the role of education in shaping knowledge. Gender differences were observed, with females demonstrating greater awareness of stretch marks than males, potentially due to societal influences and a stronger focus on skincare among women. These results highlight the importance of factoring in demographic variables when evaluating knowledge and designing educational programs on dermatological issues like stretch marks.

Table 6. The results of the knowledge-based questions were compared to student demographics, education, or work experience (n = 36)

Question: Stretch marks usually appear on the skin from rapid weight gain/weight changes, vs. the following factors		
Question vs. Comparator	Participants with correct answers (n (%))	Pearson's R asymptotic standard error
Age (Years)		0.033
• 18 to 30	31 (86.1%)	
• > 30	4 (11.1%)	
The type of work they have had.		0.047
• Pharmacy-related.	19 (55.9%)	
• Non-pharmacy related but healthcare related.	6 (17.6%) 8 (23.5%)	

• Non-healthcare related		
Highest educational level.		
• Pre-pharmacy or an associate degree	5 (13.9%)	0.037
• BSc/BA/MA/MSc or higher education	30 (83.3%)	
Gender		
• Male	9 (25.0%)	0.051
• Female	26 (72.2%)	

Stretch marks can have a substantial impact on women's lives, highlighting the necessity for alternative treatment exploration. This research had two main aims: first, to examine the existing literature on herbal treatments for stretch marks and assess their effectiveness, and second, to evaluate pharmacy students' knowledge and viewpoints regarding these treatments.

The literature review presents mixed findings on the efficacy of herbal treatments for stretch marks. Among the commonly studied options are cocoa butter, vitamin E, shea butter, and calendula oil. While shea butter and cocoa butter are shown to have moisturizing and anti-inflammatory benefits, there is no clear evidence supporting their role in preventing stretch marks. Vitamin E, despite its antioxidant effects, has not demonstrated substantial benefits in preventing stretch marks, particularly during pregnancy. In contrast, calendula oil has potential benefits for skin hydration and firmness due to its anti-inflammatory and antioxidant properties. However, there is a noticeable lack of research on the perspectives of healthcare professionals regarding the use of herbal remedies for stretch marks.

The survey was conducted among first-year pharmacy students, gathering information about their demographic characteristics, educational background, and work experience. A majority of respondents were female (75%), and the majority fell within the 18-30 years age range (90%). Most lived in the Virginia, Maryland, or District of Columbia areas, though some had relocated from other states for the pharmacy program. Around two-thirds of participants had more than three years of work experience, with half of them working in pharmacy-related fields. Additionally, over 80% had completed at least a bachelor's degree before joining the College of Pharmacy at Howard University.

In the second phase of the survey, students' knowledge and perceptions regarding stretch marks and herbal remedies were assessed. Out of 40 participants, 36 responded, yielding a 90% response rate. The opinion-based questions in the survey asked participants to rate their agreement with specific statements, and responses were categorized into two groups for analysis: those who strongly agreed/agreed and those who strongly disagreed/disagreed.

Key findings from the survey showed that most participants recognized that stretch marks can change color and acknowledged the existence of various types. However, slightly more than half viewed stretch marks as a medical condition, with some believing they should naturally fade without treatment. Notably, 55% of respondents stated that they don't recommend home remedies for stretch marks due to their limited effectiveness.

The comparison between students' responses and the existing literature emphasizes the importance of integrating evidence-based information when discussing stretch marks and their management. While some agreement exists between student perspectives and the literature, discrepancies highlight the need for a more comprehensive understanding of the condition. The knowledge-based portion of the survey revealed that almost all participants (97%) correctly identified the relationship between stretch marks and rapid weight changes. However, misunderstandings were evident, with more than half incorrectly believing that stretch marks are only caused by pregnancy and that they appear predominantly on the hands. Additionally, while 80% of participants recognized stretch marks as a type of scar, two-thirds acknowledged that they can cause itching and irritation.

The final analysis focused on the potential statistical significance of various demographic factors, education, and work experience concerning students' answers. Chi-square tests and symmetric measures were used to assess correlations, and statistical significance was determined if the p-value was 0.05 or lower. The results revealed that participants with higher educational levels, such as BSc, BA, or MA degrees, were more likely to acknowledge the existence of multiple types of stretch marks. Furthermore, younger participants (aged 18-30 years) showed a stronger understanding of the link between stretch marks and rapid weight gain than older participants. Students with pharmacy-related work experience or higher educational attainment also demonstrated a greater understanding of the condition.

In terms of gender differences, female participants exhibited a higher rate of correct responses compared to male participants, which could be due to greater awareness or societal norms related to skincare. These findings highlight the importance of considering demographic factors when analyzing knowledge and attitudes about stretch marks and the need for tailored educational strategies to address these gaps.

Although the study provides valuable insights, several limitations need to be considered. The small sample size (forty first-year pharmacy students from a single institution) may limit the generalizability of the results. Additionally, the focus on pharmacy students alone, without input from other healthcare disciplines, reduces the diversity of viewpoints. The research was conducted in a single university, which might not reflect the experiences of students from different academic settings. Larger studies with a broader participant pool are needed to confirm and extend these findings.

Conclusion

This study highlights the varying perceptions surrounding stretch marks and their treatments, particularly about herbal remedies. The impact of stretch marks extends beyond physical appearance, affecting the mental and emotional well-being of individuals, which underscores the importance of healthcare professionals being well-versed in available herbal treatment options. The research had two primary aims: first, to examine the existing body of literature on the effectiveness of herbal treatments for stretch marks, and second, to survey students to evaluate their knowledge and views on the topic. While the findings aligned with some existing studies, there were discrepancies in opinions, especially regarding the success of home remedies and the natural resolution of stretch marks over time. Even though participants demonstrated a solid grasp of essential information, some misconceptions were evident, such as the widespread belief that stretch marks are only caused by pregnancy. The study also found that demographic factors—such as age, educational background, professional experience, and gender—affect how participants understood stretch marks, which suggests that educational initiatives must be designed to meet the specific needs of different groups. The research acknowledges the limitations of the study, including the small sample size and the focus on a single university, and advocates for larger-scale studies involving a broader participant pool. In conclusion, the findings provide valuable insights into pharmacy students' awareness of stretch marks and emphasize the need for more targeted educational efforts and additional research in this field.

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