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Research Article

The Effect of Continuous Lash Lifting on the Ocular Adnexa of Selected 1st- and 2nd-Year Tourism and Optometry Students: A Basis for a Proposal of Aftercare to Users

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Abstract: Background: Lash lifting, a cosmetic procedure aimed at enhancing the appearance of natural eyelashes, poses potential risks to ocular health.
Objective: This study evaluated the effects of continuous lash lifting on tear film quality, tear quantity, and ocular adnexa among 30 first- and second-year Tourism and Optometry students at Centro Escolar University-Manila.
Methods: Baseline assessments prior to lash lifting were performed using Schirmer's test, Non-Invasive Tear Break-Up Time (NITBUT), and slit-lamp biomicroscopy. Post-procedure evaluations were conducted after the second week and after five weeks.
Results: Pre-test results revealed normal ocular health in most subjects. Post-procedure evaluations indicated significant decreases in tear quantity and stability, suggesting prevalence of dry eye syndrome with common adnexal changes such as redness, bumps, and trichiasis observed after one lash lifting cycle. ANOVA results demonstrated significant within-subject effects over time for Schirmer test ($F=33.013$, $p<.001$), NITBUT ($F=16.152$, $p<.001$), and Meibomian gland health ($F=20.536$, $p<.001$).
Conclusion: Findings highlight the need for comprehensive aftercare protocols, client education, and collaboration between lash technicians and eye care professionals to mitigate risks. This study intends not to discourage people from getting lash lifts but to highlight the benefits of professional oversight to ensure safety. It promotes awareness that lash lifts, when properly monitored, can be enjoyed safely. Further research is recommended to explore safer alternatives and long-term effects of lash lifting.

Keywords: *lash lifting, ocular health, tear film quality, dry eye syndrome, ocular adnexa, Schirmer's test, non-invasive tear break-up time (NITBUT), slit-lamp biomicroscopy*

1. Introduction

1.1 Background of the Study

Lash lifting has become a widely embraced cosmetic procedure, particularly among younger individuals, for enhancing the natural curvature and aesthetic appearance of eyelashes. The procedure involves the application of chemical solutions to the eyelashes, which break and reform the disulfide bonds in the hair's keratin structure, allowing the lashes to be repositioned into a lifted, curled state. While its popularity continues to grow, there is limited research on the potential effects of repeated lash lifting on the ocular adnexa, which includes essential structures such as the eyelids, conjunctiva, and tear film.

The demand for aesthetic enhancements has increased significantly in recent years, driven by social media influence, beauty trends, and the desire for low-maintenance beauty routines. Lash lifting offers an alternative to eyelash extensions, providing a more natural appearance with reduced maintenance requirements. However, the proximity of these procedures to the ocular surface raises important safety considerations that have not been adequately addressed in the literature.

The ocular adnexa, comprising the eyelids, conjunctiva, lacrimal apparatus, and surrounding structures, plays a critical role in maintaining ocular

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health. The tear film, which consists of three layers (lipid, aqueous, and mucin), protects the cornea, provides lubrication, and maintains optical clarity. Disruption of tear film stability can lead to dry eye syndrome, characterized by symptoms such as burning, stinging, foreign body sensation, and visual disturbances.

Understanding the effects of lash lifting on these structures is crucial, given the proximity of these structures to the eye and their role in maintaining overall ocular health. The chemical solutions used in lash lifting, which may contain ingredients such as ammonium thioglycolate, could potentially affect the ocular surface through direct contact or vapor exposure, leading to irritation, inflammation, or more serious complications.

1.2 Statement of the Problem

This study, "The Effect of Continuous Lash Lifting on the Ocular Adnexa of Selected 1st and 2nd Year Tourism and Optometry Students: A Basis for a Proposal of Aftercare to Users," aims to explore how repeated lash lifting impacts ocular health parameters such as tear production, tear film stability, and the condition of the conjunctiva and cornea. Focusing on Tourism and Optometry students, who may prioritize aesthetic enhancements due to their fields, this research provides insight into the safety and potential risks associated with lash lifting.

The specific questions this study seeks to answer are:

1. What is the profile of the subjects in terms of age and history of lash lifting?
2. What is the tear quantity and quality and the state of the structures of the ocular adnexa of the subjects prior to application of lash lifting solution?
3. What is the tear quantity and quality and the state of the different structures of the ocular adnexa of the subjects after the 2nd week and 5th week of the first cycle of application?
4. Is there a significant difference in the tear quantity and quality and the state of the structures of the ocular adnexa before and after the application of lash lifting solution?
5. Is there a significant difference in the tear quantity and quality of previous lash lift wearers and first-time lash lift wearers?

1.3 Significance of the Study

The findings of this research are significant for several stakeholders:

Lash Technicians and Beauty Professionals: The study provides evidence-based information on the potential ocular risks associated with lash lifting, enabling practitioners to better inform their clients and implement appropriate safety measures.

Consumers: Individuals considering lash lifting will benefit from understanding the potential effects on their ocular health, allowing them to make informed decisions and follow appropriate aftercare protocols.

Eye Care Professionals: Optometrists and ophthalmologists gain insights into the ocular changes that may result from lash lifting, facilitating better diagnosis and management of procedure-related complications.

Regulatory Bodies: The findings may inform the development of safety standards and guidelines for cosmetic procedures involving the periocular area.

Academic Community: This research contributes to the limited body of literature on the effects of cosmetic procedures on ocular health, providing a foundation for future studies.

1.4 Scope and Delimitation

This study focused on 30 selected first- and second-year students from the School of Tourism and Optometry at Centro Escolar University-Manila. The research examined the effects of lash lifting on tear film quality, tear quantity, and the state of ocular adnexal structures including the eyelids, meibomian glands, puncta, lashes, bulbar conjunctiva, palpebral conjunctiva, central cornea, and corneal limbus.

The study was limited to one cycle of lash lifting due to the significant adverse effects observed after the first application. Subjects were evaluated at three time points: pre-test (baseline), 2nd week post-lifting, and 5th week post-lifting. The research did not include long-term follow-up beyond the five-week period.

1.5 Definition of Terms

Lash Lifting: A cosmetic procedure that uses chemical solutions to curl and lift natural eyelashes, creating the appearance of longer, more voluminous lashes without the use of extensions.

Ocular Adnexa: The accessory structures of the eye, including the eyelids, conjunctiva, lacrimal apparatus, and surrounding tissues that protect and support the eye.

Tear Film: The thin fluid layer covering the ocular surface, consisting of three layers (lipid, aqueous, and mucin) that maintain corneal health and optical clarity.

Dry Eye Syndrome: A multifactorial condition characterized by decreased tear production, increased tear evaporation, or both, resulting in ocular discomfort and visual disturbance.

Schirmer's Test: A diagnostic procedure that measures tear production by placing filter paper strips in the lower conjunctival fornix and measuring the distance moistened over a specified time.

Non-Invasive Tear Break-Up Time (NITBUT): A measure of tear film stability assessed by observing

the time elapsed between a complete blink and the appearance of dry spots on the corneal surface using keratometry.

Trichiasis: A condition in which eyelashes grow inward toward the eye, potentially causing irritation, corneal abrasion, or infection.

Meibomian Glands: Specialized sebaceous glands located in the eyelids that secrete lipids forming the outermost layer of the tear film, preventing rapid evaporation.

2. Review of Related Literature

2.1 Lash Lifting: Procedure and Chemical Composition

Lash lifting is a cosmetic procedure that has gained significant popularity in recent years. The procedure typically involves several steps: the application of a silicone rod or shield to the eyelid, the application of a lifting solution to break the disulfide bonds in the hair, the application of a setting solution to reform these bonds in a lifted position, and the application of a nourishing or tinting solution (Campo, 2022).

The chemicals used in lash lifting procedures include ammonium thioglycolate or similar reducing agents that break the disulfide bonds in the hair's keratin structure (Beauty, 2022). These chemicals are alkaline in nature and have a pH that can potentially cause irritation if they come into contact with the ocular surface or the delicate skin of the eyelids. The setting solution contains oxidizing agents such as hydrogen peroxide or sodium bromate, which reform the disulfide bonds in the new curl pattern.

Aumond and Bitton (2018) reviewed eyelash follicle features and anomalies, highlighting that the eyelash follicle is a complex structure with unique characteristics. They noted that the proximity of the hair follicles to the ocular surface makes cosmetic procedures potentially hazardous if not performed with proper precautions.

Embleton (2022) stated that lash lifts are generally safe when performed by certified professionals, though the solution may cause irritation and inflammation on the eyelid. This emphasizes the importance of proper technique and the need for practitioners to be aware of potential adverse effects.

2.2 Ocular Effects of Cosmetic Products

The impact of cosmetic products on ocular health has been the subject of increasing research attention. Sullivan et al. (2023) conducted a comprehensive review of the TFOS lifestyle report on the impact of cosmetics on the ocular surface. They identified that cosmetic products, particularly those used in the periocular area, can affect the tear film through multiple mechanisms including direct toxicity, mechanical disruption, and alteration of the ocular surface microbiome.

Wang and Craig (2018) investigated the effect of eye cosmetics on the tear film, providing insights into how various cosmetic procedures and products can disrupt tear film stability. They emphasized that the lipid layer of the tear film may be particularly susceptible to disruption by oil-based cosmetic products.

Yazdani, Elgstøen, and Utheim (2021) reviewed the relationship between eye make-up products and dry eye disease, concluding that there is evidence to suggest a link between the use of certain cosmetic products and the development or exacerbation of dry eye symptoms. They recommended that individuals with pre-existing dry eye should be particularly cautious when using periocular cosmetics.

2.3 Dry Eye Syndrome and Its Assessment

Dry eye syndrome (DES) is a multifactorial condition of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability, with potential damage to the ocular surface. Dry eye is characterized by a loss of homeostasis of the tear film, accompanied by ocular symptoms, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles.

The Schirmer's test, as described by Shtein (2024), is a standard diagnostic procedure for measuring tear production. The test is performed by placing a strip of filter paper in the lower conjunctival fornix and measuring the amount of wetting after five minutes. Results of less than 5 mm without anesthesia indicate severe dry eye, while values between 5-10 mm suggest moderate dry eye.

The Non-Invasive Tear Break-Up Time (NITBUT) test, assessed using keratometry, measures tear film stability by observing the time between a complete blink and the appearance of dry spots on the corneal surface (Shtein, 2024). A NITBUT of less than 10 seconds is generally considered indicative of tear film instability, potentially leading to dry eye symptoms.

2.4 Studies on Cosmetic Eyelash Procedures

Masud et al. (2019) reviewed eyelid cosmetic enhancements and their associated ocular adverse effects. They identified various complications including allergic reactions, infections, ocular surface disease, and mechanical damage to the eyelids and lashes. They highlighted the importance of recognizing potential adverse effects of cosmetic eyelid procedures and the need for proper regulation and consumer education.

Nagendran et al. (2022) conducted a comprehensive review of complications and adverse effects of periocular aesthetic treatments. Their findings emphasized that while most aesthetic treatments have a favorable safety profile when performed correctly, there are significant risks associated with procedures involving the periocular area.

Mangan and İmamoğlu (2021) reported a case of preseptal cellulitis associated with a cosmetic eyelash lifting procedure. They presented a case of a 29-year-old woman who developed severe eyelid inflammation following a lash lifting procedure, highlighting that these procedures can cause serious complications that may require medical intervention.

Wachler (2022) provided an overview of the process, benefits, and risks of eyelash lifts, emphasizing that while the procedure is generally safe, there are potential risks including irritation, infection, and damage to natural lashes. He recommended that consumers choose certified professionals and properly maintain their lashes after the procedure to minimize risks.

Cecilia et al. (2020) evaluated the ocular surface and adnexa of permed lashes wearers among selected female students. The study assessed the ocular surface of subjects who wore permed lashes to determine whether there were adverse effects including dry eye, meibomian gland dysfunction, corneal staining, and other changes in ocular adnexa. Their findings suggested that eyelash perming may cause some degree of ocular irritation.

2.5 Theoretical Framework

The theoretical framework of this study is grounded in the understanding of tear film physiology and the effects of chemical and mechanical irritation on the ocular surface. The tear film is composed of three layers: an outermost lipid layer, a middle aqueous layer, and an innermost mucin layer. The lipid layer is secreted by the meibomian glands, the aqueous layer by the lacrimal glands, and the mucin layer by goblet cells in the conjunctiva.

Disruption of any layer can lead to tear film instability and the development of dry eye syndrome. The chemical solutions used in lash lifting may affect the tear film through direct toxicity to the ocular surface or through alteration of the lipid layer composition. Additionally, the mechanical manipulation of the eyelids during the procedure may cause irritation or trauma to the meibomian glands, affecting their function.

The concept of "fragile resilience," adapted from health systems literature, is relevant to understanding the response of the tear film and ocular adnexa to repeated lash lifting. The tear film has a certain capacity to maintain homeostasis despite mild disturbances, but when stressors exceed this capacity, dysfunction ensues. This concept helps explain why some individuals may tolerate lash lifting with minimal effects while others experience significant symptoms.

2.6 Conceptual Framework

The conceptual framework of this study outlines the relationship between the independent variable (lash lifting procedure) and the dependent variables (tear quantity, tear quality, and ocular adnexal health). The framework also considers potential mediating factors including age, history of lash lifting, and baseline ocular health.

The procedure involves the application of chemical solutions to the lashes, which may affect the tear film through direct contact, vapor exposure, or alteration of the ocular surface environment. The study examines these effects through objective measurements including Schirmer's test, NITBUT, and slit-lamp biomicroscopy.

The study design considers both the effects of a single lash lifting cycle as well as the potential cumulative effects of repeated procedures. The decision to limit the study to one cycle reflects the ethical responsibility of the researchers to protect the ocular health of the participants.

3. Materials and Methods

3.1 Research Design

The study employed a quasi-experimental research design incorporating pre-test and post-test observations. The procedure included a pre-test assessment, the first cycle of lash lifting, post-test evaluation after two weeks, and a final post-test evaluation after five weeks. If subjects developed moderate-severe dry eye or significant ocular adnexal changes after the first lash lifting, they did not undergo additional cycles to prevent harm to their eye health.

3.2 Participants

The study utilized a purposive sampling technique to select 30 subjects from first- and second-year students at the School of Tourism and Optometry, Centro Escolar University-Manila. This technique was chosen to intentionally select subjects based on specific inclusion and exclusion criteria.

Inclusion Criteria:

1. First- and second-year students from the School of Tourism and Optometry
2. 19 years old or older
3. Willing to participate and able to provide informed voluntary consent
4. Absence of ocular conditions or medical contraindications that could affect tear film stability
5. Baseline tear measurements recorded prior to inclusion

Exclusion Criteria:

- Students under 19 years of age
- Those with any form of skin allergies such as skin asthma

- Individuals exhibiting symptoms of severe dry eye syndrome at the time of the study

3.3 Instruments and Procedures

Pre-assessment Questionnaires: Administered by the researchers to screen and determine the eligibility of subjects for the study. These included questions about demographic information, history of lash lifting, and any pre-existing ocular conditions.

Schirmer's Test: Performed without anesthesia to measure tear production. The test involved placing a strip of filter paper in the lower conjunctival fornix and instructing subjects to close their eyes for five minutes. The amount of wetting was measured in millimeters, providing data on tear quantity and stability.

Non-Invasive Tear Break-Up Time (NITBUT): Performed using keratometry to measure tear film stability without physically contacting the ocular surface. The test determined the time required for the tear film to break after a blink, with the researchers counting "1001, 1002, 1003" and observing for when there was a significant loss of tears making the mires appear distorted.

Slit-Lamp Biomicroscopy: Utilized to evaluate the ocular adnexa for any diseases or abnormalities. Assessments focused on structures including the eyelids, meibomian glands, puncta, lashes, bulbar conjunctiva, palpebral conjunctiva, central cornea, and corneal limbus. Grading scales were used to categorize findings from Grade 0 (normal) to higher grades indicating increasing severity of abnormalities.

3.4 Procedure

The study procedure was conducted in the following steps:

- **Pre-Test Assessment:** Subjects underwent comprehensive ocular health assessment including case history questionnaires, Schirmer's test, NITBUT, and slit-lamp biomicroscopy to establish baseline measurements and confirm eligibility.
- **First Cycle of Lash Lifting:** Subjects underwent the lash lifting procedure performed by a certified professional in a controlled environment. The procedure followed standard protocols including the application of lifting and setting solutions.
- **Two-Week Post-Test Evaluation:** Two weeks after the procedure, subjects were re-evaluated using the same assessment battery including Schirmer's test, NITBUT, and slit-lamp biomicroscopy.
- **Decision on Additional Cycles:** Based on the two-week post-test results, subjects who showed moderate-severe dry eye or significant ocular adnexal changes did not undergo additional lash lifting cycles to prevent harm.
- **Five-Week Post-Test Evaluation:** All subjects underwent final evaluation five weeks after the procedure to assess the extent of recovery and persistent changes.

3.5 Statistical Analysis

Data analysis was performed using the following statistical treatments:

Percentage Frequency Distribution: Used to classify the population according to their age and history of lash lifting, and to quantify ocular surface changes after lash lifting. This statistical treatment addressed objectives one to three.

ANOVA (Analysis of Variance): Utilized to determine if there was a significant difference between the pre-test, 2nd week post-test, and 5th week post-test results. ANOVA was used since there was a progressive evaluation with subjects evaluated at three testing points. This addressed objectives four and five.

Post Hoc Tests: Conducted after ANOVA to determine exactly where the differences lay between groups and testing points. These included Bonferroni and Holm corrections to control for multiple comparisons.

Repeated Measures ANOVA: Applied to assess within-subject effects over time, allowing the evaluation of changes in ocular health parameters across the three assessment periods.

3.6 Ethical Considerations

The study was conducted in accordance with ethical principles for research involving human subjects. The researchers ensured that:

- All subjects provided written informed consent prior to participation
- Subjects were informed of the nature of the study and potential risks
- Subjects were assured of their right to withdraw at any time
- Confidentiality of personal information was maintained
- The research did not cause harm to participants, with the decision to limit the study to one lash lifting cycle reflecting this commitment
- The study was conducted in a safe environment by certified professionals

4. Results

4.1 Subject Profile

Table 1: Frequency Distribution of Subjects According to Age

Age	Frequency	Percent
19	26	86.667
20	1	3.333
21	1	3.333
22	1	3.333
29	1	3.333
Total	**30**	**100.000**

The average age of subjects in the study was approximately 19.5 years, with a notable concentration of 26 subjects aged 19, reflecting the fact that most subjects were first- and second-year college students. In contrast, the age groups 20, 21, 22, and 29 were underrepresented, each with only one subject.

Table 2: Frequency Distribution of Subjects According to Lash Lift History

Lash Lift Group	Frequency	Percent
Previous Lash Lift Wearer	15	50.000
First Time Wearer	15	50.000
Total	**30**	**100.000**

The study utilized a balanced sample size, comprising 15 previous lash lift wearers and 15 first-time wearers, to ensure objectivity and eliminate bias. This equal distribution facilitates a fair comparison of potential effects or differences between the groups.

4.2 Pre-Test Results

Table 3: Frequency Distribution of Subjects According to Schirmer's Test Pre-Test Results

Schirmer's Test (mm)	OD Frequency	OD Percent	OS Frequency	OS Percent
9	0	0.000	2	6.667
10	2	6.667	2	6.667
11	3	10.000	2	6.667
12	1	3.333	2	6.667
13	1	3.333	2	6.667
14	2	6.667	2	6.667
15	7	23.333	3	10.000
16	1	3.333	3	10.000
17	2	6.667	3	10.000
18	2	6.667	2	6.667
20	3	10.000	2	6.667
21	2	6.667	1	3.333
22	1	3.333	0	0.000
23	0	0.000	1	3.333
25	3	10.000	2	6.667
30	0	0.000	1	3.333
Total	**30**	**100.000**	**30**	**100.000**

The Schirmer test results showed that subjects, on average, produced 16.5 mm of tears in the right eye (OD) and 16.1 mm in the left eye (OS), with some variation between individuals. This procedure was done without

anesthesia. The standard deviations of 4.4 mm (OD) and 5.1 mm (OS) indicate a considerable range in tear production, suggesting significant individual differences in tear secretion levels.

Table 4: Frequency Distribution of Subjects According to NITBUT Pre-Test Results

NITBUT (seconds)	OD Frequency	OD Percent	OS Frequency	OS Percent
6	0	0.000	1	3.333
7	1	3.333	0	0.000
10	3	10.000	3	10.000
11	4	13.333	0	0.000
12	2	6.667	8	26.667
13	5	16.667	3	10.000
14	4	13.333	3	10.000
15	4	13.333	6	20.000
16	2	6.667	1	3.333
17	3	10.000	2	6.667
18	1	3.333	3	10.000
Total	**30**	**100.000**	**30**	**100.000**

The NITBUT test results showed that the right eye had an average tear breakup time of 17.0 seconds, while the left eye had an average of 13.6 seconds. The right eye exhibited a high level of variability in tear breakup times (SD = 20.4), while the left eye showed more consistency with a lower standard deviation of 2.7 seconds.

Table 5: Pre-Test Ocular Adnexa Health Summary

Structure	Grade 0 (%)	Grade 1 (%)	Grade 2 (%)	Remarks
Eyelids	100.00	0.00	0.00	No scarring or redness
Meibomian Glands	96.67	3.33	0.00	Mostly normal
Puncta	100.00	0.00	0.00	Clear, no blockage
Lashes	96.67	3.33	0.00	Full, outward, free from dust
Bulbar Conjunctiva	13.33	70.00	16.67	Trace to mild injection
Palpebral Conjunctiva	66.67	30.00	3.33	Mostly normal
Central Cornea	100.00	0.00	0.00	Normal
Corneal Limbus	93.33	6.67	0.00	Mostly normal

The pre-test results indicated that most subjects had normal ocular health with no significant abnormalities. The eyelids were free from scarring or redness, meibomian glands were functioning normally, and puncta were clear with no blockage. Lash health was generally good, with most subjects having full, outward-growing lashes. Some subjects showed trace to mild conjunctival injection, but these were considered minor and not indicative of significant pathology.

4.3 Post-Test Results: Two Weeks

Table 6: Schirmer's Test Results Two Weeks Post-Lash Lifting

Schirmer's Test (mm)	OD Frequency	OD Percent	OS Frequency	OS Percent
2	1	3.333	0	0.000
3	0	0.000	3	10.000
5	0	0.000	2	6.667
6	0	0.000	2	6.667
7	1	3.333	2	6.667
8	2	6.667	1	3.333
9	4	13.333	4	13.333
10	5	16.667	4	13.333
11	3	10.000	1	3.333
12	4	13.333	2	6.667
13	2	6.667	2	6.667
15	1	3.333	3	10.000
17	1	3.333	0	0.000
20	3	10.000	3	10.000
23	1	3.333	1	3.333
26	1	3.333	0	0.000
31	1	3.333	0	0.000
Total	**30**	**100.000**	**30**	**100.000**

Two weeks post-lifting, tear production ranged from 2 mm to 31 mm, with most values clustering between 9 mm and 13 mm. Peaks occurred at 10 mm for both eyes, indicating normal tear production in most subjects. Low (≤8 mm) and high (≥20 mm) tear production were rare. Average tear production was slightly higher in OD (13.0 mm, SD = 6.14 mm) than OS (10.6 mm, SD = 5.30 mm), showing some variability in ocular surface health.

Table 7: NITBUT Results Two Weeks Post-Lash Lifting

NITBUT (seconds)	OD Frequency	OD Percent	OS Frequency	OS Percent
2	1	3.333	1	3.333
3	4	13.333	2	6.667
4	0	0.000	2	6.667
5	1	3.333	1	3.333
6	4	13.333	5	16.667
7	3	10.000	5	16.667
8	4	13.333	0	0.000
9	3	10.000	2	6.667

10	6	20.000	6	20.000
11	0	0.000	3	10.000
12	0	0.000	1	3.333
13	2	6.667	0	0.000
14	0	0.000	1	3.333
15	1	3.333	1	3.333
16	1	3.333	0	0.000
Total	**30**	**100.000**	**30**	**100.000**

NITBUT results two weeks post-lifting showed tear break-up times ranging from 2 to 16 seconds, with most subjects falling between 6 and 10 seconds. The highest frequency (20%) occurred at 10 seconds for both eyes. Shorter times (≤5 seconds) were less common, as were values above 10 seconds. Mean NITBUT was 8.0 seconds (SD = 3.49) for OD and 7.93 seconds (SD = 3.25) for OS, indicating similar tear stability with slight variability. This means that the tear quality of the respondents gradually dropped compared to the pre-test results.

Table 8: Ocular Adnexa Health Two Weeks Post-Lash Lifting

Structure	Grade 0 (%)	Grade 1 (%)	Grade 2 (%)	Key Findings
Eyelids	66.67	-	-	Redness, bumps observed in some
Meibomian Glands	60.00	40.00	0.00	Increased Grade 1 incidence
Puncta	100.00	0.00	0.00	No blockage
Lashes	63.33	-	-	Still lifted, trichiasis in some
Bulbar Conjunctiva	3.33	56.67	40.00	Increased injection
Palpebral Conjunctiva	30.00	60.00	10.00	Mild to moderate redness
Central Cornea	100.00	0.00	0.00	Unaffected
Corneal Limbus	86.67	13.33	0.00	Mild injection

Two weeks post-procedure, significant changes were observed in multiple ocular structures. Eyelid health showed some deterioration, with 33.33% of subjects exhibiting abnormalities including redness and bumps. Meibomian gland function declined, with 40% showing Grade 1 mild dysfunction compared to only 3.33% at baseline. Lash health was affected, with some subjects developing trichiasis and most subjects' lashes remaining heavily lifted, preventing further lifting procedures.

Conjunctival health showed the most significant changes, with bulbar conjunctiva exhibiting Grade 1 (56.67% OD, 66.67% OS) and Grade 2 (40% OD, 30% OS) changes, indicating increased injection and irritation. Palpebral conjunctiva showed similar patterns, with 60% displaying mild redness and 10% showing moderate changes. The central cornea remained unaffected in all subjects, while the corneal limbus showed mild injection in 13.33% of subjects.

4.4 Post-Test Results: Five Weeks

Table 9: Schirmer's Test Results Five Weeks Post-Lash Lifting

Schirmer's Test (mm)	OD Frequency	OD Percent	OS Frequency	OS Percent
1	1	3.333	2	6.667

3	1	3.333	2	6.667
4	1	3.333	0	0.000
6	0	0.000	1	3.333
7	6	20.000	4	13.333
8	4	13.333	2	6.667
9	1	3.333	8	26.667
10	4	13.333	3	10.000
11	4	13.333	0	0.000
12	1	3.333	0	0.000
13	1	3.333	3	10.000
15	3	10.000	1	6.667
16	0	0.000	1	6.667
17	1	3.333	0	0.000
18	1	3.333	0	0.000
19	0	0.000	1	3.333
20	1	3.333	0	0.000
Total	**30**	**100.000**	**30**	**100.000**

After five weeks, Schirmer's test results showed that the majority of subjects had moderate to mild dry eyes, with most readings ranging from 7 mm to 11 mm in both eyes. The right eye had a higher mean tear production (10 mm) compared to the left (9.133 mm). These results suggest mild to moderate impact on tear production after lash lifting, with some instances of severe dryness or normal tear production. This was the lowest mean tear production compared to the pre-test and two-week post-test results.

Table 10: NITBUT Results Five Weeks Post-Lash Lifting

NITBUT (seconds)	OD Frequency	OD Percent	OS Frequency	OS Percent
2	1	3.333	1	3.333
3	2	6.667	3	10.000
4	1	3.333	0	0.000
5	4	13.333	5	16.667
6	6	20.000	8	26.667
7	8	26.667	2	6.667
8	4	13.333	4	13.333
9	1	3.333	4	13.333
10	1	3.333	1	3.333
12	0	0.000	2	6.667

16	2	6.667	0	0.000
Total	**30**	**100.000**	**30**	**100.000**

NITBUT distribution five weeks after lash lifting showed that in the right eye, the most frequent time was 7 seconds (26.67%), indicating that most subjects had lesser tear break-up time compared to the second week. For the left eye, the most common time was 6 seconds (26.67%). These results indicate moderate tear film stability in both eyes post-procedure, with a significant decrease from baseline values.

Table 11: Ocular Adnexa Health Five Weeks Post-Lash Lifting

Structure	Grade 0 (%)	Grade 1 (%)	Grade 2 (%)	Key Findings
Eyelids	66.67	-	-	Slight improvement from week 2
Meibomian Glands	50.00	50.00	0.00	Further decline
Puncta	100.00	0.00	0.00	Still unaffected
Lashes	76.67	-	-	Still lifted, trichiasis persistent
Bulbar Conjunctiva	0.00	76.67	23.33	No Grade 0 observed
Palpebral Conjunctiva	10.00	86.67	3.33	Mostly mild redness
Central Cornea	100.00	0.00	0.00	Unaffected
Corneal Limbus	86.67	13.33	0.00	Minor changes

Five weeks post-procedure, the ocular adnexa showed some recovery in eyelid health but continued changes in other structures. Eyelids showed improvement, with 66.67% of subjects free from abnormalities, similar to the two-week result. Meibomian gland function continued to decline, with 50% showing Grade 1 mild dysfunction.

Lash health remained affected, with most subjects' lashes still lifted and unsuitable for further procedures. Trichiasis was observed in 13.33% of subjects, indicating that some lashes were turning inward toward the eye. Conjunctival health remained compromised, with bulbar conjunctiva showing no Grade 0 results, and most subjects exhibiting Grade 1 (76.67%) or Grade 2 (23.33%) changes. The central cornea remained unaffected, and corneal limbus showed minor changes in a small percentage of subjects.

4.5 Statistical Analysis

Table 12: ANOVA Results for Schirmer's Test

Cases	Sum of Squares	df	Mean Square	F	p	Interpretation
Within Subject Effects	1411.511	2	705.756	33.013	<.001	Significant
Between Subject Effects	160.556	1	160.556	2.136	0.155	Non-significant

The ANOVA results for the Schirmer test demonstrated a significant F-value (33.013, $p < .001$), indicating a notable decrease in tear production over time, with the most significant changes observed at the five-week mark. While there is a significant drop in tear quantity among all subjects, there is no significant difference between the Schirmer's test results between the two groups (previous wearers vs. first-time wearers).

Table 13: Post Hoc Schirmer Test Comparisons

Week Comparison	Mean Difference	T-value	Pbonf	Pholm	Interpretation
Pre vs. 2Wk	4.500	4.329	<.001	<.001	Significant
2Wk vs. 5Wk	0.657	3.607	0.004	0.001	Significant

Post hoc comparisons for the Schirmer test illustrated significant differences in tear production between pre-treatment and 2-week post-treatment, and between 2-week and 5-week post-treatment. This shows that tear quantity significantly dropped from the first evaluation to the second and third evaluations, with the most dramatic drop occurring in the first two weeks.

Table 14: ANOVA Results for NITBUT Test

Cases	Sum of Squares	df	Mean Square	F	p	Interpretation
Within Subject Effects	2528.544	2	1264.272	16.152	<.001	Significant
Between Subject Effects	2.450	1	2.450	0.023	0.879	Non-significant

The ANOVA results for NITBUT demonstrated a significant F-value (16.152, $p < .001$), indicating a significant decrease in tear quality among all 30 subjects over the three testing periods. This confirms that lash lifting had a negative impact on tear film stability. The results were non-significant when comparing the two groups, indicating that both groups experienced similar decreases in tear quality.

Table 15: Post Hoc NITBUT Test Comparisons

Week Comparison	Mean Difference	T-value	Pbonf	Pholm	Interpretation
Pre vs. 2Wk	7.333	3.874	0.002	0.001	Significant
2Wk vs. 5Wk	1.117	2.110	0.132	0.044	Non-significant

Post hoc results for NITBUT showed a significant decrease in tear film stability over time. The pre-test to two-week post-treatment comparison showed significant results with a mean difference of 7.333 and a p-value of 0.001. This means that tear quality significantly dropped within the first two weeks after lash lifting. While there was a mean difference of 1.117 between the two-week and five-week results, it was not statistically significant, suggesting that most changes occurred within the first two weeks.

Table 16: Repeated Measures ANOVA Results for Meibomian Gland

Cases		Sum of Squares	df	Mean Square	F	p	Interpretation
Within Effects	Subject	6.878	2	3.439	20.536	<.001	Significant
Between Effects	Subject	2.006	1	2.006	3.505	0.072	Non-significant

Repeated measures ANOVA for Meibomian gland outcomes showed significant within-subject effects over time ($F = 20.536$, $p < .001$), indicating that the lash lift procedure had a substantial long-term effect on meibomian gland function. The comparison between the two lash lift groups showed no significant difference in meibomian gland outcomes over time ($p = 0.072$). This indicates that lash lifting significantly affects meibomian gland function regardless of previous lash lift history.

Table 17: Post Hoc Comparisons of Meibomian Gland

Week Comparison	Mean Difference	T-value	Pbonf	Pholm	Interpretation
Pre vs. 2Wk	-0.367	-4.363	<.001	<.001	Significant
2Wk vs. 5Wk	-0.083	-1.316	0.596	0.199	Non-significant

Post-hoc comparisons showed significant differences between the pre-test and both two-week and five-week measurements. However, the comparison between two and five weeks showed no significant difference. These

results indicate that most meibomian gland changes occurred early in the observation period, with no significant variations after two weeks.

Table 18: Repeated Measures ANOVA Results for Bulbar Conjunctiva

Cases	Sum of Squares	df	Mean Square	F	p	Interpretation
Within Subject Effects	3.233	2	1.617	4.844	0.011	Significant
Between Subject Effects	0.139	1	0.139	0.164	0.688	Non-significant

Repeated measures ANOVA for bulbar conjunctiva outcomes showed significant within-subject effects over time ($F = 4.844$, $p = 0.011$), indicating that the lash lift procedure affected conjunctival outcomes. The variability in results suggested notable changes within patients over time. However, between-subject effects revealed no significant differences between the two lash lift groups ($F = 0.164$, $p = 0.688$).

Table 19: Post Hoc Comparisons of Bulbar Conjunctiva

Week Comparison	Mean Difference	T-value	Pbonf	Pholm	Interpretation
Pre vs. 2Wk	-0.317	-3.004	0.017	0.017	Significant
2Wk vs. 5Wk	0.083	0.922	1.000	0.365	Non-significant

Post-hoc comparisons of bulbar conjunctiva outcomes showed significant changes between the pre-test and two-week measurements, indicating an early response to lash lifting. However, the pre-test to five-week comparison showed a smaller, non-significant difference, suggesting subtle changes over five weeks. There were no significant differences between two and five weeks. These results suggest that most changes occurred within the first two weeks, with minor or stable effects thereafter.

Table 20: Repeated Measures ANOVA Results for Palpebral Conjunctiva

Cases	Sum of Squares	df	Mean Square	F	p	Interpretation
Within Subject Effects	10.533	2	5.267	14.000	<.001	Significant
Between Subject Effects	1.800	1	1.800	2.224	0.147	Non-significant

Repeated measures ANOVA for palpebral conjunctiva outcomes showed significant within-subject effects over time, with an F-value of 14.000 and $p < .001$, indicating that lash lifting caused observable changes in the palpebral conjunctiva during the observation period. Between-subject effects comparing prior wearers and first-time wearers were not significant ($F = 2.224$, $p = 0.147$), suggesting that differences between user groups were likely due to chance.

Table 21: Post Hoc Comparisons of Palpebral Conjunctiva

Week Comparison	Mean Difference	T-value	Pbonf	Pholm	Interpretation
Pre vs. 2Wk	-0.433	-3.548	0.004	0.003	Significant
2Wk vs. 5Wk	-0.133	-1.265	0.649	0.216	Non-significant

Post-hoc comparisons showed that lash lifting had a significant effect on the palpebral conjunctiva after two weeks of application. Little to no changes were observed between the two-week and five-week results. This indicates that most conjunctival changes occurred within the first two weeks after the procedure.

Table 22: Repeated Measures ANOVA Results for Central Cornea

Cases	Sum of Squares	df	Mean Square	F	p	Interpretation
Within Subject Effects	0.044	2	0.022	1.000	0.374	Non-significant
Between Subject Effects	0.022	1	0.022	1.000	0.326	Non-significant

The ANOVA results for central cornea showed non-significant within-subject effects (p = 0.374) and between-subject effects (p = 0.326). This indicates that the central cornea was not affected after the application of lash lifting, suggesting that the cornea is relatively resistant to the effects of the procedure.

Table 23: Repeated Measures ANOVA Results for Corneal Limbus

Cases	Sum of Squares	df	Mean Square	F	p	Interpretation
Within Subject Effects	0.144	2	0.072	0.603	0.551	Non-significant
Between Subject Effects	0.272	1	0.272	0.827	0.371	Non-significant

The ANOVA results for corneal limbus showed non-significant within-subject effects (p = 0.551) and between-subject effects (p = 0.371). This means that there was not much difference in the observations of the corneal limbus between the two groups, indicating that it did not pose further harm even after lash lifting.

5. Discussion

5.1 Tear Production and Stability

The findings of this study revealed a significant decline in tear production and stability following lash lifting. Schirmer test results showed that mean tear production decreased from 16.5 mm (OD) and 16.1 mm (OS) at baseline to 13.0 mm (OD) and 10.6 mm (OS) at two weeks, and further to 10.0 mm (OD) and 9.1 mm (OS) at five weeks. This progressive decline indicates that lash lifting has a negative impact on tear quantity that may continue to worsen over time.

The NITBUT results similarly showed a decline in tear film stability, from baseline values of 17.0 seconds (OD) and 13.6 seconds (OS) to 8.0 seconds (OD) and 7.9 seconds (OS) at two weeks, and slightly lower values at five weeks. A NITBUT of less than 10 seconds is generally considered indicative of tear film instability and potential dry eye syndrome. The significant decrease in NITBUT values suggests that lash lifting compromises tear film stability, likely due to the chemical agents used in the procedure.

These findings are consistent with previous research on the effects of cosmetic products on the ocular surface. Sullivan et al. (2023) found that cosmetic products, particularly those used in the periocular area, can affect the tear film through multiple mechanisms including direct toxicity, mechanical disruption, and alteration of the ocular surface microbiome. The chemical solutions used in lash lifting likely cause direct irritation to the ocular surface, leading to increased tear evaporation and decreased tear film stability.

Yazdani, Elgstøen, and Utheim (2021) similarly found evidence linking the use of certain cosmetic products to the development or exacerbation of dry eye symptoms. This study extends these findings to the specific context of lash lifting, demonstrating that this popular procedure can also contribute to dry eye symptoms.

The finding that tear production and stability continued to decline at five weeks post-procedure, albeit at a slower rate than in the first two weeks, suggests that the effects of lash lifting may be persistent. While some recovery may occur over a longer period, the significant changes observed at five weeks indicate that the procedure's effects may be long-lasting.

5.2 Ocular Adnexa Health

The study found significant changes in various ocular adnexal structures following lash lifting. Meibomian gland health declined from 96.67% Grade 0 at baseline to 60% Grade 0 at two weeks, with 40% showing Grade 1 mild dysfunction. At five weeks, only 50% maintained Grade 0, while 50% showed Grade 1 dysfunction. This progressive decline in meibomian gland function is concerning, as these glands are essential for maintaining the lipid layer of the tear film and preventing rapid evaporation.

The meibomian gland changes are likely due to the application of chemicals near the eyelid margins during the procedure. The lifting and setting solutions may affect the gland orifices, leading to capping or dysfunction. Additionally, the mechanical manipulation of the eyelids during the procedure may cause trauma to the glands. This is consistent with the findings of Mangan and İmamoğlu (2021), who reported that cosmetic eyelid procedures can lead to inflammation of the eyelid tissues.

Eyelid health showed some changes following the procedure, with redness and bumps observed in a minority of subjects. While most subjects maintained healthy eyelids, the appearance of redness suggests mild irritation due to the procedure. This is consistent with the findings of Masud et al. (2019), who found that eyelid cosmetic enhancements can cause irritation and inflammation.

Lash health was significantly affected by the procedure, with most subjects' lashes remaining lifted and unsuitable for further procedures even at five weeks. Inward-turning lashes (trichiasis) were observed in 13.33% of subjects, indicating that lash lifting can alter the direction of lash growth in some individuals. This is a concerning finding, as trichiasis can cause corneal irritation and abrasion.

Conjunctival health was among the most affected structures. Bulbar conjunctiva showed increased injection and irritation, with no Grade 0 observed at five weeks. Palpebral conjunctiva similarly showed mild to moderate redness in most subjects. These changes suggest that the chemical agents used in lash lifting cause conjunctival irritation, consistent with the findings of Nagendran et al. (2022) regarding periocular aesthetic treatments.

Notably, the central cornea remained unaffected in all subjects throughout the study period. This is reassuring, as it suggests that the procedure does not cause direct damage to the cornea. The corneal limbus showed only mild changes in a small percentage of subjects, indicating that the effects of the procedure are generally limited to the conjunctiva and surrounding structures.

5.3 Comparison Between Previous and First-Time Wearers

The study found no significant differences between previous lash lift wearers and first-time wearers in terms of tear production, tear quality, or most ocular adnexal changes. This suggests that the effects of lash lifting are not cumulative in the way one might expect, or that previous wearers may have adapted to the procedure in some way.

However, the post-hoc comparisons for bulbar conjunctiva showed significant differences between the two groups at certain time points. First-time wearers showed greater changes at two weeks compared to previous wearers, suggesting that the initial exposure to the procedure may cause more pronounced conjunctival responses. This is consistent with the idea that the conjunctiva may develop some tolerance or adaptation to the chemical agents over time.

The absence of significant differences between the two groups for most outcomes suggests that individual variability and baseline characteristics may play a more prominent role than prior lash lifting experience. This is consistent with clinical observation that some individuals are more susceptible to the effects of cosmetic procedures than others.

5.4 Implications for Practice

The findings of this study have several important implications for practice:

Client Education: Lash technicians should inform clients about the potential risks of lash lifting, particularly the possible onset of dry eye symptoms and ocular adnexal changes. This is consistent with the recommendations of Wachler (2022), who emphasized the need for client education before the procedure.

Time Between Sessions: The study found that significant changes occurred within the first two weeks and continued to progress to five weeks. This suggests that allowing adequate time between lash lifting sessions is essential to allow the ocular surface to recover. A minimum gap of three months between sessions is recommended, as suggested by Campo (2022).

Aftercare Routines: The study highlights the need for standardized aftercare routines to support eye health after lash lifting sessions. This includes the use of lubricating eye drops and warm compresses and lid massages to maintain optimal tear quality.

Professional Oversight: The findings emphasize the importance of collaboration between lash technicians and eye care professionals. Regular visits to optometrists are encouraged to monitor tear production, eye comfort, and any changes in ocular health.

Training: Lash technicians should be trained to recognize the risks associated with lash lifting and dry eye syndrome. They should keep records of when clients last had the procedure to ensure eligibility for further sessions.

5.5 Limitations of the Study

Several limitations should be considered when interpreting the findings of this study:

Sample Size: The sample size of 30 subjects, while adequate for statistical analysis, may not be sufficient to generalize findings to the broader population. A larger sample size would provide more robust evidence.

Demographic Homogeneity: The subjects were primarily young adults with an average age of 19.5 years. This demographic homogeneity may limit the generalizability of findings to older age groups, who may have different baseline ocular health and responses to cosmetic procedures.

Short Follow-up Period: The study followed subjects for only five weeks. Longer-term follow-up would be valuable to assess whether the observed changes are reversible or persistent.

Single Procedure Cycle: The study was limited to one cycle of lash lifting due to the significant adverse effects observed. This prevents assessment of the cumulative effects of repeated procedures.

Subjective Symptoms: The study focused on objective measurements of tear quantity, tear quality, and ocular adnexal health. Subjective symptoms such as discomfort or visual disturbance were not systematically assessed.

Environmental Factors: The study did not control for environmental factors such as air conditioning, screen time, or other activities that might affect tear film stability.

6. Conclusions

Based on the analysis and interpretation of the findings, the following conclusions are presented:

1. **Subject Profile:** Most subjects were aged 19, reflecting the demographic composition of first- and second-year Tourism and Optometry students. The 30 subjects were divided equally into two groups: 15 first-time lash lift wearers and 15 previous lash lift wearers. There were no significant differences in results between these two groups, suggesting that previous exposure to lash lifting does not confer protection against its adverse effects.
2. **Lash Lifting and Dry Eye:** Lash lifting can cause dry eye syndrome. Even after just one session, consumers may experience significant decreases in tear quantity and stability. Subjects with borderline tear function at baseline were at higher risk of developing severe dry eye symptoms after the procedure. The repeated measures ANOVA confirmed significant within-subject effects over time for Schirmer's test ($F=33.013$, $p<.001$), NITBUT ($F=16.152$, $p<.001$), and meibomian gland health ($F=20.536$, $p<.001$).
3. **Ocular Adnexal Changes:** The most common effects of lash lifting observed on the ocular adnexa were redness, bumps, minimal scarring, and trichiasis. While some of these changes were not statistically significant when comparing between groups, it is notable that the chemical solutions and materials used in the procedure can cause these changes to the structures of the ocular adnexa.
4. **Cessation of Additional Cycles:** The researchers opted to stop the observation period after one lash lifting cycle to prevent further harm to the subjects' ocular health. This decision was made due to the significant adverse effects observed, including dry eye symptoms and adnexal changes. This highlights the potential risks associated with repeated lash lifting and the importance of prioritizing safety.
5. **Central Corneal Preservation:** Despite other ocular changes, the central cornea remained unaffected in all subjects throughout the study period. This suggests that the cornea is relatively resistant to the effects of the procedure, which is reassuring for safety.

7. Recommendations

The growing popularity of lash lifting raises concerns regarding its potential impact on eye health. This study emphasizes the importance of awareness about the risks that come with this lash procedure, particularly the possible onset of dry eye symptoms. The following recommendations are made to improve client safety, foster better practices, and minimize ocular risks.

7.1 For Lash Technicians

Raise Awareness of Eye Health Risks: Lash technicians should inform their clients about the risks associated with lash lifting, particularly the decrease in tear quantity and quality as well as ocular adnexa alterations. This should be done before the procedure during the consultation process.

Encourage Time Between Lash Lifting Sessions: It is essential to space out lash lifting appointments to mitigate risks to eye health and reduce the likelihood of worsening symptoms, irritation, and discomfort. Approximately 3 months between sessions is recommended to allow the ocular surface to recover.

Standardize Aftercare Routines: A standardized aftercare routine should be established to support eye health after lash lifting sessions. This includes the use of lubricating eye drops and warm compresses and lid massages to maintain optimal tear quality.

Train on Dry Eye Risks: During their training before certification, lash technicians should be trained to recognize the risks associated with lash lifting and dry eye syndrome. It is recommended that they keep records of when clients last had the procedure to ensure eligibility for further sessions.

7.2 For Consumers

Seek Professional Oversight: Before undergoing lash lifting, individuals should consult with eye care professionals to assess their baseline ocular health and identify any risk factors for dry eye disease.

Follow Aftercare Instructions: Clients should follow provided aftercare instructions diligently to minimize risks to ocular health.

Space Out Sessions: Clients should space out lash lifting sessions to allow the ocular surface to recover. A minimum of 3 months between sessions is recommended.

Schedule Regular Eye Exams: Regular visits to optometrists are encouraged to monitor tear production, eye comfort, and any changes in ocular health. During case history, doctors can elicit information if their patient is a lash lift wearer and perform tear assessment tests.

7.3 For Future Researchers

Longitudinal Studies: Longer-term follow-up studies are needed to assess the long-term effects of lash lifting on ocular health, including whether the observed changes are reversible or permanent.

Meibography: Future research should include meibography in the examination period to establish whether the evaporative type of dry eye is due to changes in the meibomian gland itself. This would help determine if lash lifting poses a risk of inducing permanent dry eye problems.

Diverse Demographics: Research with a more diverse demographic range (different age groups, occupations, and baseline health statuses) would enhance the generalizability of findings.

Comparative Studies: Studies comparing different lash lifting products and techniques could help identify safer alternatives.

Subjective Symptoms: Future studies should systematically assess subjective symptoms including discomfort, visual disturbance, and overall satisfaction to complement objective measurements.

8. Summary

This study evaluated the effects of continuous lash lifting on tear film quality, tear quantity, and ocular adnexa among 30 first- and second-year Tourism and Optometry students at Centro Escolar University-Manila. The research employed a quasi-experimental design with pre-test and post-test evaluations conducted at two weeks and five weeks following the procedure.

The findings revealed significant decreases in tear production and stability, indicating a prevalence of dry eye syndrome among subjects following lash lifting. Common ocular adnexal changes included redness, bumps, and trichiasis. The central cornea remained unaffected in all subjects throughout the study period.

Statistical analysis using ANOVA demonstrated significant within-subject effects over time for Schirmer's test ($F=33.013$, $p<.001$), NITBUT ($F=16.152$, $p<.001$), meibomian gland health ($F=20.536$, $p<.001$), bulbar conjunctiva ($F=4.844$, $p=0.011$), and palpebral conjunctiva ($F=14.000$, $p<.001$). No significant differences were observed between previous lash lift wearers and first-time wearers for most outcomes, suggesting that both groups experience similar effects.

The study underscores the need for comprehensive aftercare protocols, client education, and collaboration between lash technicians and eye care professionals to mitigate risks. It intends not to discourage people from getting lash lifts but to highlight the benefits of professional oversight to ensure safety. The research promotes awareness that lash lifts, when properly monitored, can be enjoyed safely.

This research was conducted to keep up with the growing trend while encouraging responsible practices for those who choose to undergo the procedure. Further research is recommended to explore safer alternatives and long-term effects of lash lifting.

9. Proposed Aftercare Routine

For those who are interested in lash lifting, following this aftercare routine is suggested to control and alleviate symptoms of discomfort. Following these steps is crucial to ensure a safe lash enhancement procedure:

Immediate Post-Procedure (24-48 hours):

1. Avoid getting the lashes wet for 24 hours
2. Avoid rubbing or touching the eyes
3. Do not apply eye makeup for 48 hours
4. Sleep on the back to avoid crushing the lifted lashes

First Week After Procedure:

1. Apply lubricating eye drops as needed to maintain moisture
2. Avoid activities that cause eye strain or excessive blinking
3. Wear sunglasses to protect from wind and dust

Ongoing Care:

- Perform warm compresses and lid massages daily
- Maintain hygiene of the eyelid margins
- Schedule regular eye examinations
- Space out lash lifting appointments with a minimum of 3 months between sessions
- Monitor for signs of dryness, redness, or discomfort and consult an eye care professional if symptoms develop

References

Ai, S. (2024, February 8). The relationship between lash lifts and eye health: A detailed insight. Beauty Endevr. https://beautyendevr.com/blogs/news/the-relationship-between-lash-lifts-and-eye-health-a-detailed-insight

Almond, G. (2021, May 23). Hair-Raising Issues in Eye Cosmetics with Laura M. Periman, MD. Dry Eye Master.

https://dryeyemaster.com/hair-raising-issues-in-eye-cosmetics/

Aumond, S., & Bitton, E. (2018). The eyelash follicle features and anomalies: A review. Journal of Optometry, 11(4), 211–222. https://doi.org/10.1016/j.optom.2018.05.003

Beauty, T. (2022, August 24). Are lash lifts safe? Twenty/Twenty Beauty. https://trytwentytwenty.com/blogs/blog/are-lash-lifts-safe

Biscaldi, L. (2021, July 19). Steering clear of makeup misuse can prevent ocular disease. Medical Bag. https://www.medicalbag.com/home/news/improper-eyelid-cosmetic-hygiene-can-lead-to-ocular-surface-disease-and-infections/2/

Campo, D. (2022, August 24). Are lash lifts safe? Twenty/Twenty Beauty. https://trytwentytwenty.com/blogs/blog/are-lash-lifts-safe

Capas, A. (2023, January 30). Are Lash Lifts Worth It? Here's What To Know Before Trying. Cleveland Clinic. https://health.clevelandclinic.org/are-lash-lifts-safe/

Cecilia, L., Yu, N., Basan, C. D., Dichoso, C. F. J., Escobar, M. I. C., Estrella, A. J. C., Garcia, E. J. D., Musico, R. R. D., Ocampo, K. L. L., Oro, P. a. C., Remandaban, J. M. N., Rongavilla, M. M. D., & Sahagun, A. a. N. (2020). The Proceedings of the 2nd Bakti Tunas Husada-Health Science Evaluation of the Ocular Surface and Adnexa of Permed Lashes Wearer Among Selected 4-th year Female Students of the School of Optometry. International Conference. https://doi.org/10.2991/ahsr.k.200523.049

Doll, B. T. (2019, November 15). Lashing Out: Dangerous Beauty Trends. Review of Optometry. https://www.reviewofoptometry.com/article/lashing-out-dangerous-beauty-trends

Embleton, F. (2022, December 29). What is a lash lift? Process, costs & care, explained. Glamour UK. https://www.glamourmagazine.co.uk/article/lash-lift

Kwon, T. I., & Heo, H. S. (2019, September 26). Appearance satisfaction and self-esteem according to the actual situation of eyelash beauty. Asian Journal of Beauty and Cosmetology. https://www.e-ajbc.org/journal/view.php?number=1174

Leasca, S. (2022, October 2). What is a lash lift and why is everyone talking about it? Real Simple. https://www.realsimple.com/beauty-fashion/skincare/lash-lift

Maglente, S. (2021, November 2). What is a lash lift? Here's everything you need to know. Good Housekeeping. https://www.goodhousekeeping.com/beauty-products/a33809958/what-is-lash-lift/

Mangan, M. S., & İmamoğlu, S. (2021). Preseptal cellulitis associated with cosmetic eyelash lifting procedure. Journal of Cosmetic Dermatology, 20(6), 1846–1848. https://doi.org/10.1111/jocd.14142

Masud, M., Moshirfar, M., Shah, T. J., Gomez, A. T., Avila, M. R., & Ronquillo, Y. C. (2019). Eyelid Cosmetic Enhancements and Their Associated Ocular Adverse Effects. Medical Hypothesis, Discovery and Innovation in Ophthalmology, 8(2), 96–103. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6592309/

Nagendran, S., Ali, M. J., Doğru, M., & Malhotra, R. (2022). Complications and adverse effects of periocular aesthetic treatments. Survey of Ophthalmology, 67(3), 741–757. https://doi.org/10.1016/j.survophthal.2021.04.009

Pazhoohi, F., & Kingstone, A. (2023, September 8). Eyelash length attractiveness across ethnicities. Nature News. https://www.nature.com/articles/s41598-023-41739-5

Shtein, R. M. (2024, January 2). Dry eye disease. UpToDate. https://www.uptodate.com/contents/dry-eye-disease

Sullivan, D., Da Costa, A., Del Duca, E., Doll, T., Grupcheva, C., Lazreg, S., Liu, S., McGree, S., Murthy, R., Narang, P., Ng, A., Nitisco, S., O'Dell, L., Roos, J., Shen, J., & Markoulli, M. (2023, April 13). TFOS lifestyle: Impact of cosmetics on the ocular surface. The Ocular Surface. https://www.sciencedirect.com/science/article/pii/S1542012423000319

Wachler, J. N. R. B. B. B. (2022, January 26). Eyelash lifts: Process, benefits and risks. All About Vision. https://www.allaboutvision.com/eye-care/cosmetic/eyelash-lift/

Wang, M. T., & Craig, J. P. (2018). Investigating the effect of eye cosmetics on the tear film: current insights. Clinical Optometry, Volume 10, 33–40. https://doi.org/10.2147/opto.s150926

Wilson, J. (2022, August 31). Are Lash Lifts Safe? Here's What You Should Know Before Getting One. Yahoo. https://www.yahoo.com/news/lash-lifts-safe-heres-know-152425535.html

Wróbel-Dudzińska, D., Osial, N., Stępień, P. W., Gorecka, A., & Żarnowski, T. (2023, January 11). Prevalence of Dry Eye Symptoms and Associated Risk Factors among University Students in Poland. International Journal of Environmental Research and Public Health. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9859544/

Yazdani, M., Elgstøen, K. B. P., & Utheim, T. P. (2021). Eye make-up products and dry eye disease: a mini review. Current Eye Research, 47(1), 1–11.