

# Knowledge and Awareness of ocular problems associated with the use of eyelash extensions among female undergraduates

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## ABSTRACT

**Background:** Eyelash extensions are used to enhance the length, curliness, fullness and thickness of the natural eyelashes. The use of eyelash extensions is a common cosmetic practice among young women. This involves attaching synthetic eyelashes by means of an adhesive to the eyelashes. **Objective:** The aim of this study was to assess the awareness and knowledge of female undergraduates of the University of Benin on the possible dangers of use of eyelash extensions. **Method:** This was a descriptive cross-sectional study using questionnaires. Study population comprised female undergraduates in the University of Benin. A structured questionnaire assessing demographic variables, knowledge of eyelash extensions, usage as well as awareness of ocular complications was distributed among 2057 females aged 16-35 years with a mean age of 20 ( $\pm 2.1$  SD) years. Data obtained from the participants was processed using the statistical package for social sciences (SPSS) version 22.0 and presented in percentages and tables. **Results:** We found that 99.76% ( $n=2052$ ) of respondents were knowledgeable about eyelash extensions. Over two-thirds of the respondents had fixed eyelash extensions (67.77%). Cosmesis/beauty was the most common reason for fixing eyelash extensions (65.42%,  $n=912$ ). About seventy-one percent (70.73%) of those who had fixed eyelash extensions knew about some complications from the use of eyelash extensions. The most common complication experienced was itching (62.7%). Social event outings were the major reason given why over two-thirds of respondents fixed eyelash extensions (69.80%,  $n=973$ ). **Conclusion:** Eyelash extensions has become a very popular procedure especially among young female students of higher institutions and may cause ocular problems. Adequate attention should be paid to the potential ocular health risks of the procedure and those who want to undergo this procedure, should be enlightened.

**Key words:** Eyelash, cosmesis, complications, eyecare, extensions.

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## Introduction

Eyelashes or cilia are the hairs that grow on the eyelid margins. They grow in multiple layers (3-5 layers) on the eyelid margin and they are anchored to the eyelid by a 'root'. In the human embryo, the eyelashes develop from the ectoderm between the 22<sup>nd</sup> and 26<sup>th</sup> week of pregnancy.<sup>1</sup> Natural eyelash do not grow beyond a certain length and they fall off by themselves without any need for trimming or plucking. Eyelashes are not androgenic and as such, they are not affected by puberty.<sup>2</sup>

The eyelash follicles are associated with the following secretory glands: Glands of Zeis (holocrine glands) which releases sebum that acts as a lubricant and has anti-microbial properties and Glands of Moll (apocrine glands) which are found only in the eyelids and they produce secretions, thought to have anti-microbial properties. Eyelashes are biological polymers like all the other hairs of the human body.

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They are made up of about 10% water and 90% proteins (keratins and melanins).<sup>3,4</sup>

The eyelashes function like the whiskers of a cat or a mouse, in that they are sensitive to touch and as such they provide a warning that an object (such as an insect) is near the eye which then closes reflexively. They protect the eyes from debris, dust and small particles which could possibly cause damage to the eyes. Eyelashes also elicit the blink reflex when stimulated, this blink reflex serves to lubricate the globe and to keep it wet and healthy.<sup>5,6</sup>

Eyelash extensions are used to enhance the length, curliness, fullness, and thickness of the natural eyelashes. They are categorized as strip lashes, individual flare lashes and single individual lashes.<sup>7,8</sup> The extensions are made from synthetic fibers (such as nylon) and natural fibers (such as silk, mink and human or horse hair).

In 1902, a famous hairstylist and inventor, Karl Nessler patented a method to weave artificial eyebrows and eyelashes in the United Kingdom and began selling them at his salon in 1903. In the United States, a Canadian Anna Taylor got the patent for false eyelashes in 1911. As techniques improved, false lashes became more popular with the general public in the 1930s and again in the 1960s.<sup>9,10</sup>

In recent times, eyelash extensions have become a cosmetic trend the world over, with long lashes mostly considered a sign of femininity in many cultures.<sup>11</sup> The procedure involves attachment of eyelash extensions made from synthetic fibers (such as nylon) or natural fibers (such as horse hair, silk or mink) individually onto the natural eyelashes with the aid of an adhesive. Eyelash extensions can also be used for individuals with thin or short eyelashes, usually used alongside mascara to create a "bold look" or thicken the look of the natural lashes.<sup>12,13</sup>

It is important to pay close attention to the effect of these eyelash extensions, as continual fixing of the extensions may interfere with the periodic shedding and growth of new lashes and cause discomfort.<sup>14</sup> It could also irritate the eyelids and clog follicles as well as pull out lashes during removal.<sup>15</sup>

There is also a risk of the erosion of the inner surface of the eyelids which could result in a permanent damage to the eyelashes. As the procedure does not allow for frequent washing of the eyelids, it could result in bacteria and/or fungal infections as seen in ocular discharge with conjunctivitis and eyelid

diseases. When wet with sweat or water, they may be displaced and act as foreign body in the eye.<sup>16,17</sup>

The glue used for the attachment of the extensions usually contains formaldehyde which is a known carcinogen and it could cause a severe allergic reaction which could result in oozing and crusting of the eyelashes. The eyelash glue is one of the most important materials needed for the application of eyelash extensions besides the eyelash extension itself. The glue is made up of chemicals and ingredients that may be irritating or harmful to the skin of the eyelid or to the eyes itself. Some ingredients commonly found in eyelash extension glue include, but are not limited to latex, cellulose gum and benzoic acid. Benzoic acid used in eyelash adhesive is a white crystalline powder with a faint, non-offensive odour. It could cause eye damage, irritation of the skin leading to rash and redness and/or a burning feeling.<sup>18,19</sup> Cyanoacrylates (most commonly ethyl cyanoacrylate) which is the base for almost all quick drying adhesives, is the chemical that makes the glue 'grab' onto the lashes and dry almost immediately. It could cause ocular irritation and could burn the skin and eyes. Poly Methyl Methacrylate (PMMA) which forms the long lasting strong bond, is what is responsible for the long retention of the lashes. PMMA has been known to cause allergic reactions around the skin and ocular irritations.<sup>20,21</sup>

Abah *et al.*<sup>7</sup>, conducted a study on eyelash extension use among female students in Kaduna Polytechnic, Kaduna in 2017. It was discovered that the prevalence for eyelash usage was 38.7% with beauty being the most common reason for use (56.1%). The most frequent symptom experienced was itching (45.8%), other symptoms of note were redness (45.5%), pain (43.9%) and heavy eyelids (41.6%).

Koffuor *et al.*<sup>14</sup>, carried out a study in the Kumasi Metropolis of the Ashanti Region of Ghana. They used a questionnaire consisting of open and close-ended questions and administered it to 120 females in saloons, shops and homes in the region. Among the 120 females interviewed, it was reported that 69.2% had had their lashes extended more than 3 times. 81.6% extended their lashes to enhance their beauty. 97.5% had one or more of the following, dry eyes, itchy eyelids, tearing, burning sensation, lid swelling and pain, misdirected lashes, casting of shadow in vision, purulent discharges and eyelashes falling into the eye. A similar study was conducted by Amano and Nishiwaki.<sup>15</sup> They used a web-based survey/self-



administered online questionnaire containing questions on the basic characteristics of the study participants, their experiences with eyelash extensions and any extension-related health problem. The study included 2000 women aged 15-59 years randomly selected across the country and it was found that 10.3% had had eyelash extensions installed, of this percentage of women, 26.8% experienced health/ocular problems such as ocular hyperaemia, pain, itchy and swollen eyelids.

Eyelash extensions are a great way to beautify the eyes and face but are not without side effects. The most common of these effects include but are not limited to; burning sensation caused by the eyelash glue, tearing, itching, boils on eyelids, dryness of the eyes caused by added exposure of the cornea surface to air, pulling out of the natural eyelash, misdirected lashes, allergic reaction around the eyes, heavy eyelids, redness, foreign body sensation and discharge.

Previous studies<sup>22,23</sup> have shown that the use of eyelash extensions and adhesives used during the attachment procedure have been associated with some ocular symptoms. The aim of this study was to assess the awareness and knowledge of female undergraduates of the University of Benin on the possible dangers of use of eyelash extensions.

**Method**

This was a descriptive cross-sectional study design. Female undergraduate students of the University of Benin were recruited for this study. The students were from various Faculties in the University. Students from a 100 level to 600 level depending on their course of study were recruited for the study. The purpose of the study was explained to the students and interested volunteers were recruited by convenience sampling. A pretested structured questionnaire was designed to capture data on demographics, knowledge of eyelash

extensions, usage and awareness of ocular complications of use. The questionnaire was adapted from the study by Abah *et al.*, (2017).

This study was carried out in both the Ugbowo and Ekehuan campuses of the University of Benin, Benin City, Edo state, Nigeria.

Approval was obtained from the Ethical and Research Committee of the Department of Optometry, University of Benin. Informed consent was obtained from the subjects.

**Statistical Analysis**

Data obtained was processed using the Statistical Package for Social Sciences (SPSS) version 22.0. Results are presented in tables as mean +/- SD and percentiles.

**Results**

A total of 2100 questionnaires were given out and 2057 were returned properly and completely filled. This gave a response level of 97.95%. Participants were aged between 16-35 years of age with a mean age of 20 ( $\pm 2.1SD$ ) years. Participants aged 16-20 years made up the largest number of the study population (35.10%).

Table 2 shows that majority of the respondents 43.11%, had used eyelash extensions just once. The main reason given for the use of eyelash extensions was cosmesis/beauty 65.42%, this is presented in table 3. Table 4 shows the sources of knowledge of effects of use of eyelash extensions and the main source was reported as personal experience of the users 37.95%.

Factors influencing the use of eyelash extensions are presented in table 5, with attendance of social events 69.80%, being the main factor. Table 6 shows a list of ocular symptoms experienced after fixing of eyelash extensions. The commonest reported symptoms were itching 19.58%, burning sensation 19.30% and eyelashes falling out 11.12%.

**Table 1:** Age groups of respondents

	N	%
16-20	722	35.10
21-25	677	32.90
26-30	429	20.86
31-35	229	11.14
<b>Total</b>	<b>2057</b>	<b>100.00</b>



**Table 2:** Frequency of use of eyelash extensions among respondents

	N	%
Weekly	222	15.93
Every 2 weeks	293	21.02
Monthly	278	19.94
Just once	601	43.11
<b>Total</b>	<b>1394</b>	<b>100.00</b>

**Table 3:** Reasons for use of eyelash extension

	N	%
Cosmesis/beauty	912	65.42
Peer influence	321	23.03
Mark of social class	84	06.23
Others (curiosity, etc)	77	05.52
<b>Total</b>	<b>1394</b>	<b>100.00</b>

**Table 4:** Sources of knowledge of effects of use of eyelash extensions

	N	%
Social media	272	19.51
Friends	309	22.17
Relatives	151	10.83
Health workers	133	09.54
Personal experience	529	37.95
<b>Total</b>	<b>1394</b>	<b>100.00</b>



**Table 5:** Factors influencing frequency of use of eyelash extensions

	N	%
Social events	973	69.80
Demand/request from partner	132	09.47
Routine lifestyle	229	16.43
Others (photoshoots, birthdays)	60	04.30
<b>Total</b>	<b>1394</b>	<b>100.00</b>

**Table 6:** Ocular symptoms experienced after fixing eyelash extensions

	Never		Occasionally		Frequently		Always	
	N	%	N	%	N	%	N	%
Itching	520	37.30	453	32.50	273	19.58	148	10.62
Burning sensation	682	48.92	345	24.75	269	19.30	98	07.03
Discharge	1162	83.36	143	10.26	66	04.73	23	01.65
Tearing/watering	1171	84.00	193	13.85	21	01.51	09	00.65
Red eyes	1098	78.77	206	14.78	54	03.87	36	02.58
Lid swelling	1127	80.85	213	15.28	34	02.44	20	01.43
Pain on the eyelid	937	67.22	292	20.95	84	06.03	81	05.81
Foreign body sensation (FBS)	1178	84.51	159	11.41	38	02.73	21	01.51
Misdirected lashes	1206	86.51	156	11.19	83	05.95	35	02.51
Boil on eyelids	985	70.66	304	21.81	68	04.88	37	02.65
Heavy eyelids	785	56.31	474	34.00	81	05.81	54	03.95
Lashes falling out	689	49.43	478	34.29	154	11.12	73	05.24



## Discussion

Fixing of eyelash extensions is a popular procedure, especially common among urban young women. However, there are potential health risks associated with the procedure. The eyes are one of the biggest markers of facial beauty and attraction and as such, enhancing the eyes has become a very popular fashion trend in the 21<sup>st</sup> century.

Eyelash extensions are a way of enhancing the natural lashes with the aid of synthetic fibers like nylon and other chemical fibers or natural fibers like silk and mink, they aid in creating the 'illusion' of thicker, fuller and darker eyelashes.<sup>1</sup>

Trubilin *et al.*<sup>16</sup>, in 2018 conducted research among practitioners in ophthalmology to detail the rise in the presentation of cases of the effects of cosmetic procedures on the paraorbital areas, as well as directly on the eyelids. Fixing of eyelash extensions was among the manipulations widely used that often lead to various complications of the vision organ.

In this study, a huge majority of the respondents were knowledgeable about the use of eyelash extensions, showing that it was indeed a very common trend. Cosmesis/beauty was the most common reason for fixing eyelash extensions. These findings are similar to the study done by Abah *et al.*<sup>7</sup>, where it was reported that beauty was the most common reason for fixing eyelash extension, followed by curiosity and peer pressure. Also, the study by Kouffor *et al.*,<sup>14</sup> reported that the reason why the majority of their respondents extended their eyelashes was to enhance their beauty. The age range of respondents in this study is impressionable and susceptible to peer pressure. It is usually at this time that young adults who are just stepping out of parental control want to experiment and try out new things. The females extended their eyelashes to look attractive and keep abreast of the latest fashion trend.

Most of the respondents had fixed eyelash extensions only once. The majority of the respondents learned of the side effects of use of eyelash extension from personal experience. The commonest factor influencing frequency of use for most of the respondents was attendance of social events. Itching was the commonest ocular problem reported amongst others. These findings are similar to those reported by Masud *et al.*<sup>17</sup> and Abah *et al.*<sup>7</sup> The study by Kouffor *et al.*<sup>14</sup>, discovered that all participants identified with one adverse effect or the other with the majority reporting three to four adverse effects after the

procedure. The adverse effects reported after the procedure were similar to those reported in this study. These findings are also similar to those reported in a study by Amano *et al.*<sup>15</sup> Masud *et al.*<sup>17</sup>, in a retrospective study across various medical journals on the associated ocular adverse effects of eyelid cosmetic enhancements reported that 73.3% of patients experienced side effects after the application of eyelash extensions which includes itching (45.8%) among others. Failure to treat those reactions most often leads to other serious ocular disorders like contact dermatitis, toxic conjunctivitis, conjunctiva erosion and allergic blepharitis.

These ocular responses have been investigated by many sources and the sources narrowed down to the lash glue adhesive and to the mechanical limitations of the lash extensions themselves. Detrimental effects of this procedure on vision therefore could be a risk factor in socioeconomic development.<sup>23</sup>

Visual disruptions can and often do interfere with reading and learning. All of the respondents are currently in the higher institution of learning which shows that the procedure is done by the literate population who want to explore other avenues of looking beautiful as this was the main reason for undergoing the procedure of fixing eyelash extensions.

Eyelash extensions are a popular procedure that has probably come to stay in the fashion industry but it comes with associated ocular problems. Despite these associated risks, the popularity of the procedure seems to be on the rise. This therefore indicates that people do not realize the imminent hazards the procedure could have on the eye and on vision. Females who patronize this procedure need to be educated on how use of eyelash extensions could affect vision so as to limit the frequency of use.

## Conclusion

Eyelash extensions have become a very popular procedure, especially among young females' students of higher institutions. Due to the various ocular effects reported, eyecare practitioners are encouraged to enlighten their patients on the possible risks involved. It is also necessary to educate those involved in this business on healthy ways to disinfect devices, provide handling instructions for organic solvents and improve the knowledge of the targeted population to the dangers associated with this procedure.



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**Conflict of Interest:** None

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