

Monthly Colored Contact Lenses in an E-marketplace, Thailand: Information That the Customers Should Know

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Abstract

Objectives: To survey the situation of monthly colored contact lenses (CL) in an e-marketplace and how much of CL information about product detail, direction of the CL using, warning and caution that the customers received.

Methods: This cross-sectional study included 252 product pages from 23 online shops through one electronic marketplace (e-marketplace), Thailand. CL information was collected from homepage, product page, postal transportation, CL box, label and medical device documentation (MDD) during 2021. We also collected information about online shops, product page characteristics, documents and additional items in the parcel box.

Results: Half of shops were opened less than 1 year ago, 60.87% sold colored CL only for decorative purposes and 8.7% sold CL cleaning machines. 237 pairs of colored CL, vial and blister packaging from 19 shops were sent via postal transportation. All shops gave CL cases and 1 out of 3 shops provided CL inserter-removers, tweezers and case kits. Product details were found to be complete in the CL product, except for the message “do not sell separately” which was only found in 94.12%. Indications of the CL, usage instructions and storage were the least information about CL direction that the customers received (17.65%). Warning and caution of the CL were found less than 18%.

Conclusion: CL wearers who purchased monthly colored CL in an e-marketplace received less CL information regarding purposes, how to use, keeping of the CL, warning and caution. The study suggested that MDD was an important tool for sending CL information to the customers.

Conflicts of interests: There are no conflicts of interest.

Keywords: colored contact lens, e-marketplace, information, label, medical device documentation

EyeSEA 2022;17(1): 5-13

DOI: <https://doi.org/10.36281/2022010201>

Introduction

Decorative or prescription contact lenses (CL) are considered as medical devices and regulated by both the Thai and United States (US) Food and Drug Administration (FDA). To prescribe CL, physician or licensed eye care professionals

are necessary in America but not in Thailand, so self-care process and awareness of Thai CL wearers are important in this situation. CL wearers must follow the doctor's advice and the manufacturer's guide regarding how to use, store the CL, CL care, when to replace the CL, as well as be educated about the warnings and cautions for serious consequences, such as eye infection or ocular surface injury which could lead to the blindness.^{1,2} Since 2010, The Medical Devices Control Division, the Ministry of Public Health of Thailand have regulated CL as a medical device and specify comprehensive CL information on

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Received: March 8, 2022

Accepted: May 15, 2022

Published : June 30, 2022

the label, medical device documentation (MDD) in the purpose of the safe use and prevention of the misuse. However, recent marketing survey found that the customers who bought monthly colored CL from the markets did not receive all important CL information as the law stated which might not safe for the CL wearers.³

Electronic marketplace (e-marketplace) is a virtual marketplace where buyers and sellers meet to exchange numerous information regarding product and service offerings.^{4,5} The strong point of e-marketplace include a variety of products that addresses the customers' needs, while weak points include duplicated sales, inappropriate selling price, difficult contact with the seller, no individual approach and poor quality product from some sellers.⁶ In Thailand, internet usage and the value of electronic commerce are increasing each year.^{7,8} E-marketplace enables both the sellers to find new buyers, increase sales and the buyers for access to a broader range of products and services. CL product also widely sold in the e-marketplace due to rising popularity among the teenagers' group and no law for regulate the CL seller.¹

The purpose of this study is to survey the situation of monthly colored CL in an e-marketplace and how much of CL information that the customers received from the e-marketplace which important to CL caring processes. This research is a descriptive study, aimed to present the overall monthly colored CL information

from purchasing via an e-marketplace. The result of this study can provide the information for both the sellers, customers and ophthalmologists in understanding the situation of colored CL and the overall CL information via the e-marketplace purchasing which may be the way to improve the CL data recognition regarding the CL caring processes.

Materials and Methods

This study was a cross-sectional study and was conducted in accordance with Declaration of Helsinki, and approved by the Committee for the Protection of Human Participants in Research, Ubon Ratchathani University, Thailand. [UBU-REC-46/2564]. Researchers surveyed through one popular e-marketplace website based in Thailand during 2021. We used the keyword of contact lenses in the search engine and set "colored contact lenses" in related categories bar, power lens: 0 and usage contact lens: monthly to find the total amount of monthly colored CL items in this website. The total amount of 679 items were found from searching with these keywords. Sample size in this study was calculated by Yamane's formula. The result of 252 samples from 23 online shops were included in this study by systematic random sampling method. Data collection was conducted along the routes of monthly colored CL information (Figure 1) as follows.

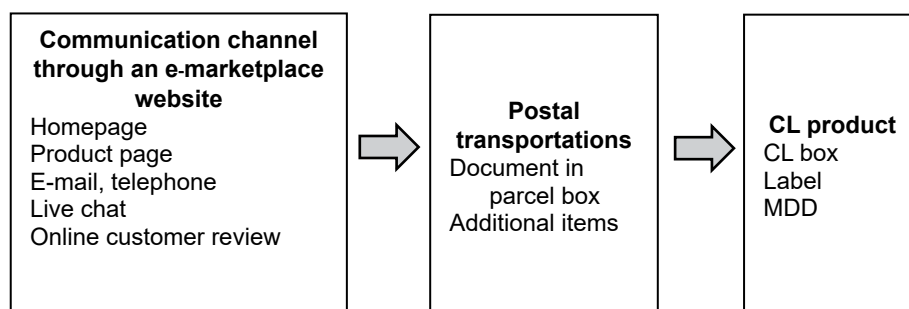


Figure 1: Routes of monthly colored contact lens information via an e-marketplace (Abbreviations: e-mail; electronic mail, CL; contact lens, MDD; medical device documentation)

Online shop characteristics and information

Data collection about shop characteristics was collected from the 23 homepages e.g. length of time that open, type of monthly colored CL, type of product selling in the online shop, CL information about direction, warning and caution. In this study, researchers did not collect information from e-mail, telephone, live chat or online customer review.

Product page characteristics and information

Two hundred and fifty-two product pages were examined for the type of data (text or image) according to the brand, product model, color, power of CL and FDA number in purpose of survey the popular type of data presentation. Each product page had two important informative parts which included the title and product detail. Researchers examined the title and product detail according to the brand, product model and FDA number which were the basic information of colored CL products. The FDA number of each brand was checked with Thai FDA website. Causes of confused information about brand and product model in each page were considered by a consensus of 2 out of 3 researchers' opinion. CL information in the product page which were product detail, direction, warning and caution were also collected.

Parcel box, CL product and information

All the samples were ordered, and sellers sent the CL product via postal transportation. Parcel box from each shop was opened and assessed for informative documents and additional items from the sellers. CL information included product detail, direction, warning and caution from CL box, label and MDD were also collected.

Conflict of interest

The authors declare no conflict of interest and declare that the research was conducted in the absence of any commercial or financial relationships that

could be construed as a potential conflict of interest.

Results

Six hundred and seventy-nine product items which were found from searching through an e-marketplace website, Thailand during 2021. Two hundred and fifty-two product pages from 23 online shops were included in this study. Most online shops (47.83%) had been opened for less than 1 year and 60.87% sold only decorative purpose (Table 1). Some online shops (8.70%) sold CL cleaning machines (Figure 2). Half of online shops sold beauty-related products along with the monthly colored CL.

For the majority of the products, the seller used combined text and images to present information about the CL brand, product model, color and power of CL. Some product pages did not have information about their selling items e.g. brand, product model, color or power of CL (Table 2). About 22.22% of product pages had FDA numbers that was not associated with the brand of CL at the title. The main cause of confusion for customers about the product was due to having more than one product detail in the information section (13.09% and 7.94%, respectively) (Table 3).



Figure 2: Contact lens cleaning machine from an electronic marketplace

Table 1: Homepage characteristics [23 homepages]

Variables	Frequency	Percent (%)
Length of time the homepage was opened		
<1 year	11	[47.83]
1-2 year (s)	3	[13.04]
2-3 years	3	[13.04]
3-4 years	3	[13.04]
4-5 years	2	[8.70]
no data found in homepage	1	[4.35]
Type of monthly colored CL in the shop		
only decorative purpose	14	[60.87]
decorative and refractive error purposes	9	[39.13]
CL-related items selling		
artificial tear drops	2	[8.70]
automated CL cleaning machine	2	[8.70]
CL inserter-remover and tweezer	6	[26.09]
CL case	7	[30.43]
CL cleaning and disinfecting solution	11	[47.83]
Beauty-related product selling	12	[52.17]
Food supplement product selling	7	[30.43]
Others product selling	11	[47.83]

Abbreviation: CL; contact lens

Table 2: Type of information in the product page

Variables	Text		Image		Text & image		No data	
	N	[Percent]	N	[Percent]	N	[Percent]	N	[Percent]
1. Brand	8	[3.17]	13	[5.16]	227	[90.08]	4	[1.59]
2. Product model	6	[2.38]	12	[4.76]	233	[92.46]	1	[0.40]
3. Color	5	[1.98]	25	[9.92]	221	[87.70]	1	[0.40]
4. Power of CL	48	[19.05]	21	[8.33]	178	[70.64]	5	[1.98]
5. FDA number	108	[42.86]	34	[13.49]	75	[29.76]	35	[13.89]

Abbreviations: CL; contact lens, FDA: Food and Drug Administration

Table 3: Causes of confused information about brand and product model in product page

Causes	Brand		Product model	
	N	[Percent]	N	[Percent]
1. More than 1 name in the title	4	[1.59]	10	[3.97]
2. More than 1 name in product detail (text)	8	[3.17]	0	[0.00]
3. More than 1 name in product detail (image)	33	[13.09]	20	[7.94]
4. Not shown information in the title	8	[3.17]	8	[3.17]
5. Not shown information in the title and product detail	4	[1.59]	1	[0.40]
6. Title and product detail (text) are not correlated	11	[4.37]	0	[0.00]
7. Title and product detail (image) are not correlated	4	[1.59]	0	[0.00]

Two hundred and thirty-seven pairs of colored CL from 19 shops were sent via postal transport. Fifteen items from 4 shops were canceled by the sellers. From figure 3 shown 6 shops (31.58%) located in Bangkok (red area). The other shops were in Pathum Thani, Songkhla (orange area), Chaiyaphum, Samut Prakan (yellow area), Suphan Buri, Chon Buri and Nakhon Si Thammarat (green area). Only 5-15% of shops emphasized the customers about CL caring processes, warning and caution by adding documents in the parcel boxes. All of the shops gave CL cases and 1 out of 3 shops gave CL inserter-remover, tweezer and case kit (Table 4). Additional items from the shops are shown in figure 4.

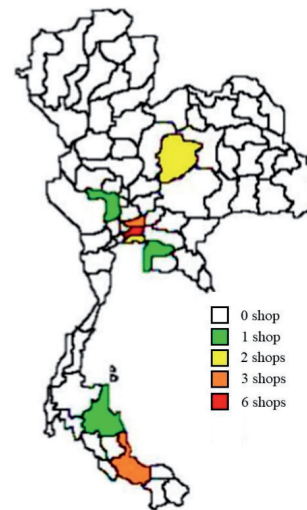


Figure 3: Number and area of colored contact lens shop (s) in this study



Figure 4: Additional items from the shops (A; contact lens cases, B; contact lens inserter-remover, tweezer and case kit, C; contact lens cleaning and disinfecting solution, D; beauty-related products and others)

Table 4: Information and additional items from the shops [19 shops]

Variables	Frequency	Percent (%)
Information from the document in parcel box		
Warning and caution of the CL usage (some detail)	3	[15.79]
CL caring process (some detail)	1	[5.26]
Message of “thank you”	8	[42.11]
Product return policy	5	[26.32]
Order summary	5	[26.32]
Promotion	1	[5.26]
Additional items		
CL case	19	[100.00]
CL inserter-remover, tweezer and case kit	6	[31.58]
CL cleaning and disinfecting solution	3	[15.79]
New pair of colored CL	3	[15.79]
Beauty-related product	4	[21.05]
Others product (portable humidifier, mask)	2	[10.53]

Abbreviation: CL; contact lens

Twelve brands of monthly colored CL which were 10 vial and 2 blister packaging. Only 1 out of 10 brands (10%) of vial packaging had CL box and MDD while all of blister packaging had CL box and MDD. Three brands

of vial packaging had 2-3 different CL boxes or labels in their brands, so the total of CL product characteristics in this study were 17 different samples. CL product information was analyzed from CL box, label and MDD (Figure 5).



Figure 5: Contact lens product information (A; contact lens box, B; label, C; medical device documentation)

CL information via an e-marketplace platform was analyzed from the homepage, product page, parcel box and CL product which revealed that the homepage did not emphasize any relevant CL information. About the directions of the CL, was found in the product page, parcel box and CL product range from 0.00-1.19%, 0.00%, 17.65-100.00% respectively. Purposes of the CL, how to use and keeping of the CL were

the least information about CL directions that the customers received (17.65%). While the detail of warning and caution of the CL were found that the customers received less than 18%. Warning and caution of CL products were found only in products which had the MDD. One out of 17 CL products (5.88%) did not have the text “do not sell separately” on the label (Table 5).

Table 5: Colored contact lens information

Variables	Homepage [23]		Product page [252]		Parcel Box: [19]		CL Product [17]		Position of the text*
	N	[Percent]	N	[Percent]	N	[Percent]	N	[Percent]	
Product detail									
Brand	N/A	N/A	248	[98.41]	0	[0.00]	17	[100.00]	Label or package, MDD
Lens material	N/A	N/A	0	[0.00]	0	[0.00]	17	[100.00]	Label or package, MDD
Lens Parameter	N/A	N/A	247	[98.02]	0	[0.00]	17	[100.00]	Label or package, MDD
Solution	N/A	N/A	0	[0.00]	0	[0.00]	17	[100.00]	Label or package, MDD
Preservative (if use)	N/A	N/A	0	[0.00]	0	[0.00]	0	[0.00]	Label or package, MDD
Expected useful life	N/A	N/A	252	[100.00]	3	[15.79]	17	[100.00]	Label or package, MDD
Lot number	N/A	N/A	0	[0.00]	0	[0.00]	17	[100.00]	Label or package
Amount in package	N/A	N/A	234	[92.86]	0	[0.00]	17	[100.00]	Label or package
Expired date	N/A	N/A	0	[0.00]	0	[0.00]	17	[100.00]	Label or package
FDA number	N/A	N/A	217	[86.11]	0	[0.00]	17	[100.00]	Label or package
Manufacturer or importer	N/A	N/A	103	[40.87]	0	[0.00]	17	[100.00]	Label or package
Message “sterile”	N/A	N/A	18	[7.14]	0	[0.00]	17	[100.00]	Label or package
Message “Do not sell separately”	N/A	N/A	0	[0.00]	0	[0.00]	16	[94.12]	Label or package
Direction									
Read MDD before use	0	[0.00]	1	[0.40]	0	[0.00]	17	[100.00]	Label or package
Should be followed up every year by ophthalmologist or optometrist	0	[0.00]	0	[0.00]	0	[0.00]	17	[100.00]	Label or package, MDD
Purposes, how to use and Keeping the CL	0	[0.00]	0	[0.00]	0	[0.00]	3	[17.65]	MDD
Wear and take off everyday	0	[0.00]	3	[1.19]	0	[0.00]	17	[100.00]	Label or package
Warning and caution									
Inappropriate use of CL is the risk of eye inflammation, infection and blindness	0	[0.00]	14	[5.56]	0	[0.00]	3	[17.65]	MDD
Do not enter more than the specified period	0	[0.00]	33	[13.10]	0	[0.00]	3	[17.65]	MDD
Do not share CL with other people	0	[0.00]	17	[6.75]	0	[0.00]	3	[17.65]	MDD
Do not wear when sleeping, should be take off and clean everyday	0	[0.00]	12	[4.76]	0	[0.00]	3	[17.65]	MDD
Who has eye abnormality e.g. pinguecula, pterygium, red eye, abnormal corneal sensation and blinking should not use CL	0	[0.00]	12	[4.76]	0	[0.00]	3	[17.65]	MDD
Changing of contact cleaner	0	[0.00]	0	[0.00]	0	[0.00]	3	[17.65]	MDD
Changing of CL case every 3 months	0	[0.00]	12	[4.76]	0	[0.00]	3	[17.65]	MDD
Do not use when swimming	0	[0.00]	12	[4.76]	0	[0.00]	3	[17.65]	MDD
Wash hand with soap before use	0	[0.00]	12	[4.76]	0	[0.00]	3	[17.65]	MDD
Stop using when abnormal eye symptom occur and see ophthalmologist	0	[0.00]	6	[2.38]	3	[15.79]	3	[17.65]	MDD
Do not use if defective product or open before use	0	[0.00]	1	[0.40]	0	[0.00]	3	[17.65]	MDD

•Notification of Ministry of Public Health “contactlens”. Bangkok: Royal Thai Government Gazette; 2010

Abbreviation: CL; contact lenses, N/A; not available, MDD; medical device documentation

Discussion

Good hygiene practice in CL usage has many important steps which are crucial and benefits for reduce the risk of CL-related microbial keratitis. Recent study reported some CL wearer's improper behaviors such as inadequate or absent handwashing, inadequate CL cleaning, disinfection, reuse of solutions, put CL in while swimming, wear expired CL, share CL with friends, CL overwear and lack of lens case replacement every 3 months have been proposed as causes of CL-related complications.^{9,10} This study demonstrated that customers who bought monthly colored CL from an e-marketplace, Thailand received less CL information regarding purposes, how to use, keeping of the CL, warnings and cautions which might not safe for CL wearers. CL product with attached MDD found in all bister and only 10% brand of vial packaging in an e-marketplace which can pass all necessary CL information to the customers as the law requires. MDD is an important tool for transmission of CL information that the CL sellers should give to the customers.

From our results, we speculated that most colored CL sellers in an e-marketplace did not realize the accuracy of CL information on the website. Most of them opened shop less than 1 year and sell non-CL-related items in the shop. Text and image were used for presenting CL information and too much text and image which did not relate to the selling item, causing confused information. About 1 out of 5 product pages had wrong presenting FDA numbers that did not deserve to happen due to medical devices. Raising awareness of the accuracy of CL information in an e-marketplace should be done in the correcting way.

Many models of CL cleaning machines were found in an e-marketplace, but few studies are known about the efficacy of these machines, eventually not the standard for CL caring processes. CL wearers should be aware of this point and not substitute CL cleaning machines to the "rub and rinse" technique. CL case was also previous reported about the presenting of bacterial biofilm contamination which CL wearers should aware and follow standard cleaning processes which were rub, rinse with CL

cleaning and disinfection solution, dry with a clean tissue, air-drying by store upside down with the caps off and replace every 3 months.^{2,11-14} Many important issues related to the colored CL usage, so Centers for Disease Control and Prevention (CDC) suggested that all colored CL required prescription and proper fitting from an eye doctor. Risks to sight and eye health from purchasing colored CL via beauty shops, drug stores, flea markets or anywhere that did not require a prescription were all the points that CL wearers should know.¹⁴

Limitation of this study was due to cross-sectional study which included a short period of survey and no searching seller's information about their career, experience in colored CL prescription which cannot reflect the CL sellers' performance in an e-marketplace.

In conclusion, CL wearers who purchased monthly colored CL in an e-marketplace received less CL information regarding purposes, how to use, keeping of the CL, warnings and cautions. Less receiving CL information may be associated with improper CL caring processes which might not be safe for the CL wearers. Another safety concern of colored CL in e-marketplace were CL wearer problems, quality and contaminating CL products which need further investigation to verify.

Acknowledgements

This research is supported by a grant from the College of Medicine and Public Health (2021). In addition, Miss Phairao Sanwang is also gratefully acknowledged.

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