

ORIGINAL ARTICLE

Analysis of dermatologic conditions in Turkey and Italy by using Google Trends analysis in the era of the COVID-19 pandemic

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Abstract

Many areas of life including patterns of dermatological diseases that patients attend to the hospital were tremendously affected by implementing stay-at-home orders during the COVID-19 pandemic. We aimed to identify the dermatologic interest of the public during the COVID-19 pandemic by using Google Trends. The terms “acne”, “hair loss”, “eczema”, “genital warts”, “molluscum contagiosum”, “botox”, “skin cancer”, and “sunscreen” were analyzed on April 1, May 1, June 1, 2020, and the corresponding period of the previous year in Turkey and Italy by using Google Trends. The searching spectrum was between March 31, 2019 and June 1, 2020. The relative change of search term “acne” was +10, +29, +13/−1, +17,+33, “hair loss” was +14, +40, +16/+3, +16, +15, and “eczema” was +2, +34, −4/ +3, +25, +18, on the other hand, the relative change of the “genital warts” was −15, −48, +10/−44, −30, +18 and “molluscum contagiosum” was −12, −2, −4/−4, −1, −12 while “botox” was, −10, −43, −8/−41, −31, +4, “skin cancer” was −27, −38, −38/−22,+33, −7 and sunscreen was −6, −25, −71/−13, 0, −45 in Turkey/Italy on April 1, May 1, and June 1, 2020, respectively. A statistically significant positive correlation was found between the number of COVID-19 cases in Turkey and search terms of the general dermatology group during the COVID-19 pandemic ($P < 0.05$). The search terms including “acne”, “eczema”, “hair loss” appears to be increasing while “molluscum contagiosum”, “genital warts” “botox”, “skin cancer”, and “sunscreen” decreasing in the era of the COVID-19 pandemic. Understanding the trends and impacts of dermatologic diseases on public perceptions during the COVID-19 pandemic will allow for better preparation of dermatologists.

KEYWORDS

COVID-19, dermatology, Google Trends

1 | INTRODUCTION

COVID-19 which has been the first time reported in Wuhan, China on December 31, 2019 by WHO continues to spread across the world in July 2020. Currently, the total number of cases has exceeded 11.5 million.¹ Many areas of life including patterns of dermatological

diseases that patient attend to the hospitals were tremendously affected by implementing stay-at-home policies.²⁻⁵ At the present time, an increasing number of people are seeking solutions including their health problems on the internet by using search engines. In this regard, there are 62.08 million (74%) internet users in Turkey and Google is the most popular search engine with 84.7% market share in

2020.^{6,7} On the other hand, there are 49.48 million (82%) internet users in Italy and Google is also the most popular search engine with a stunning market share (96.4%) in 2020.^{8,9} The commonly searched diseases on the internet can provide information about the disease spectrum of the population.^{10,11} Therefore, in this study, we aimed to evaluate whether there are changes in the trends of dermatologic diseases in Turkey and Italy locations during the COVID-19 pandemic by using Google Trends.

2 | MATERIALS AND METHODS

2.1 | Study design

Common dermatologic conditions were classified into three categories as follows: general dermatology (“acne”, “hair loss”, “eczema”), venereology (“genital warts”, “molluscum contagiosum”), cosmetology, and surgery (“botox”, “skin cancer”, “sunscreen”). These terms were searched in Turkish and Italian languages by using Google Trends in two countries (<https://trends.google.com/trends/?geo=TR> and <https://trends.google.com/trends/?geo=IT>). We compared the data of Turkey with Italy which was one of the most affected countries by the COVID-19 pandemic in order to investigate whether these searching terms objective for other communities or not. Although the first case of COVID-19 in Italy appeared earlier than Turkey, similar measures such as the shutdown of all schools and universities, lockdown orders, closure of museums, cultural centers, cinemas, theaters, pubs, and suspending of international flights were taken in both countries at approximately the same time.^{12,13}

The search terms in three groups were analyzed on April 1, May 1, and June 1, 2020, and the corresponding period of the previous year in order to rule out seasonal effects. The searching spectrum was between March 31, 2019 and June 1, 2020.

The correlation between diseases in general dermatology groups and the number of COVID-19 cases in Turkey were investigated. The statistical analysis for correlation was performed from March 11, to

June 1, 2020 in order to the first case of COVID-19 was appeared on March 11, 2020, in Turkey. The study was approved by the Ministry of Health Scientific Research Platform and the institutional review board.

2.2 | Statistical analysis

The data were analyzed in the SPSS 20.0 (SPSS Inc., Chicago, IL) program and were considered statistically significant when $P < 0.05$. Shapiro-Wilk test was used for the normal distribution of data. Spearman's rho correlation was used for not normally distributed data in continuous measurement variables.

3 | RESULTS

In Turkey/Italy on April 1, May 1, and June 1, 2020, in the general dermatology group, the relative change of “acne” was +10, +29, +13/−1, +17,+33 while “hair loss” was +14, +40, +16/+3, +16, +15, and “eczema” was +2, +34, −4/ +3, +25, +18, respectively. In the venereology group, the relative change of the “genital warts” was −15, −48, +10/−44, −30, +18 while “molluscum contagiosum” was −12, −2, −4/−4, −1, −12, respectively. In cosmetology and surgery group, the relative change of “botox” was −10, −43, −8/−41, −31, +4, while “skin cancer” was −27, −38, −38/−22, +33, −7 and sunscreen was −6, −25, −71/−13, 0, −45, respectively (Figures 1-3).

The most common search term in the general dermatology group in Turkey was “eczema” followed by “hair loss”, and “acne”, respectively, whereas it was “acne” followed by “eczema”, and “hair loss” in Italy (Figures 4 and 5). In the venereology group, “genital warts” was more common in Turkey, whereas molluscum contagiosum was more common in Italy (Figures 6 and 7). In both countries, in cosmetology and surgery group, “botox” was the most common search term followed by “sunscreen” and “skin cancer”, respectively (Figures 8 and 9).

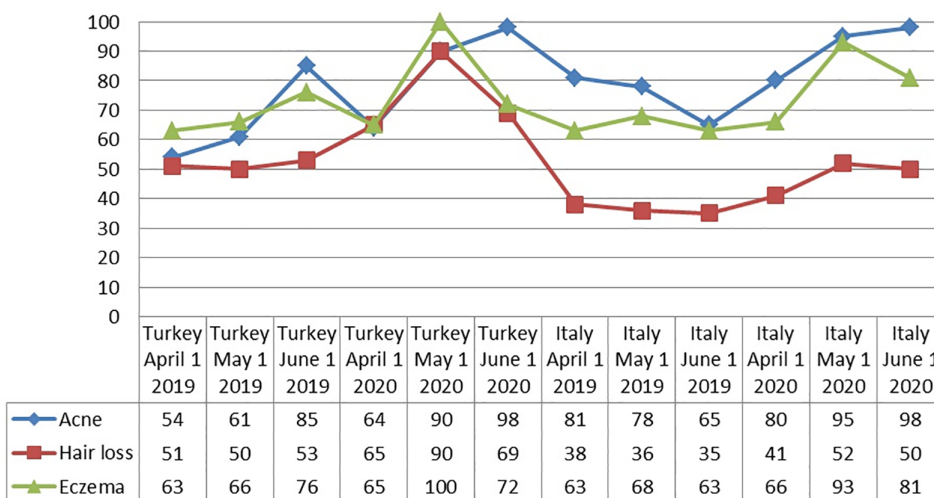


FIGURE 1 The relative change of general dermatology group in Google Trends in Turkey and Italy before and after the COVID-19 pandemic

FIGURE 2 The relative change of venereology group in Google Trends in Turkey and Italy before and after the COVID-19 pandemic

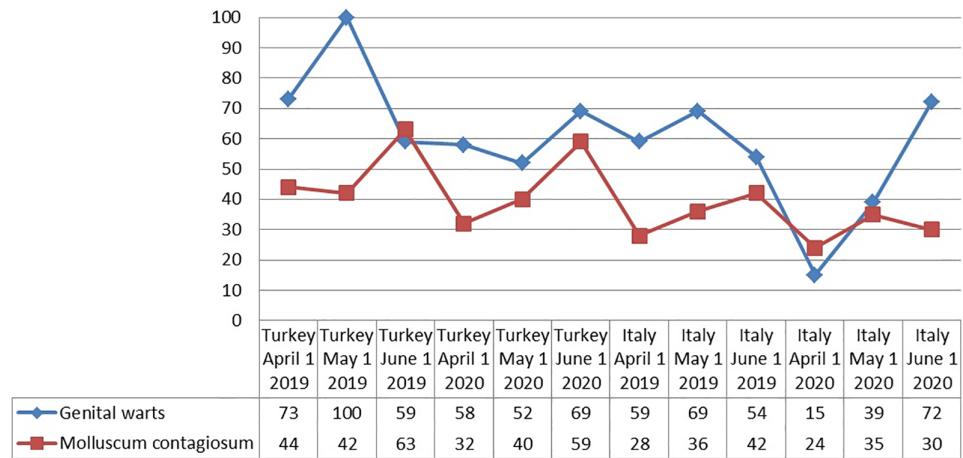


FIGURE 3 The relative change of cosmetology and surgery group in Google Trends in Turkey and Italy before and after the COVID-19 pandemic

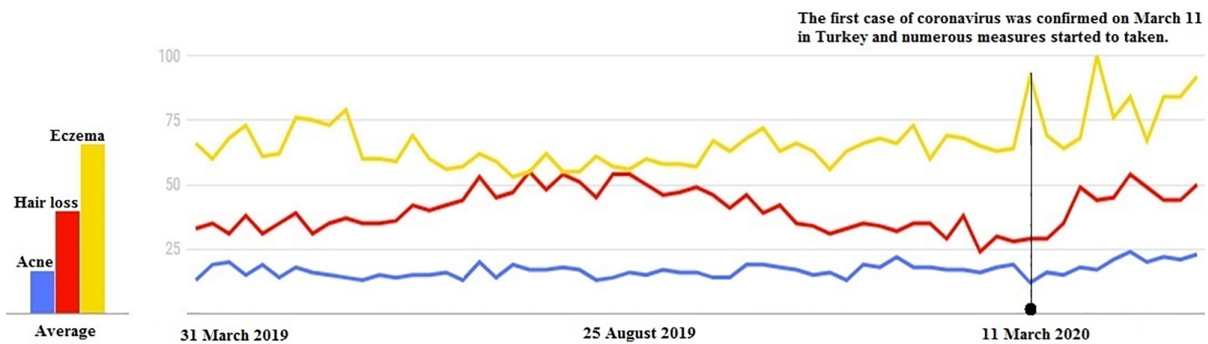
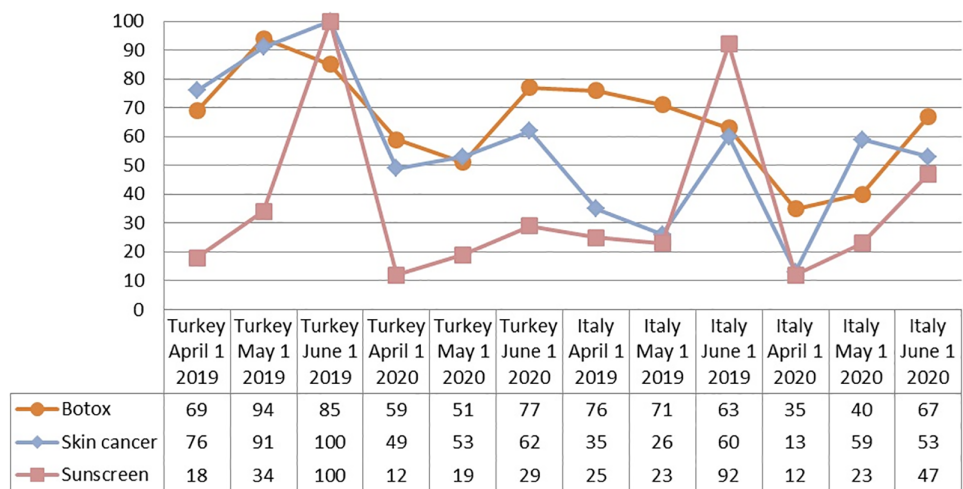


FIGURE 4 Comparison of general dermatology group with each other in Turkey from March 31, 2019 to June 1, 2020

A statistically significant positive correlation was found between the number of COVID-19 cases in Turkey and search terms of the general dermatology group during the COVID-19 pandemic (Table 1).

4 | DISCUSSION

After the COVID-19 pandemic, number of patients who request dermatology outpatient clinic visits was decreased in many countries

because of stay at home policies in order to deal with the current global pandemic.^{2,14,15} Thus, certain diseases that may be increased in number after the COVID-19 pandemic remained concealed. Dermatology outpatient clinics represent only the tip of the iceberg during the COVID-19 pandemic days. Therefore, it can be expected that using the internet quite increased by the public in order to access their health information during the current pandemic.¹⁶ The investigation of the public trends may give some clues on the frequency of certain diseases in the COVID-19 pandemic. In this context, according to

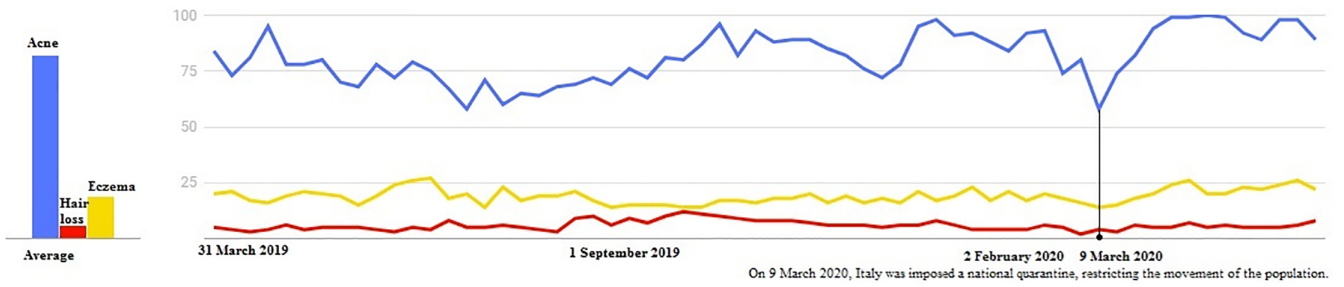


FIGURE 5 Comparison of general dermatology group with each other in Italy from March 31, 2019 to June 1, 2020

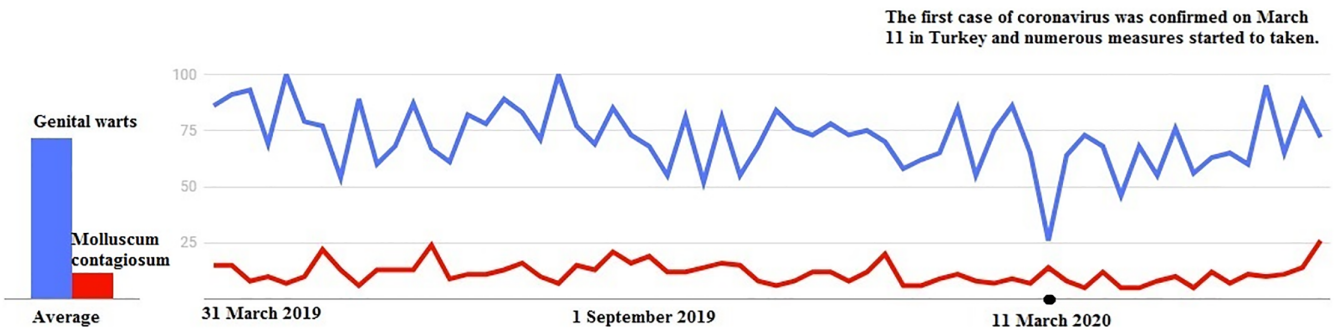


FIGURE 6 Comparison of venerology group with each other in Turkey from March 31, 2019 to June 1, 2020

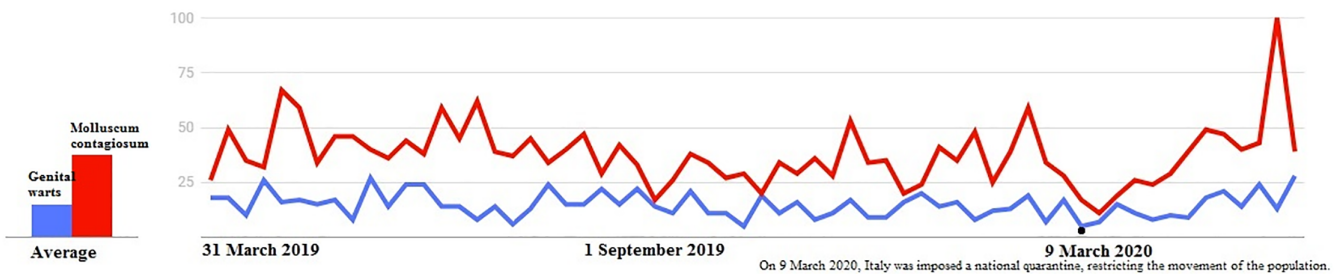


FIGURE 7 Comparison of venerology group with each other in Italy from March 31, 2019 to June 1, 2020

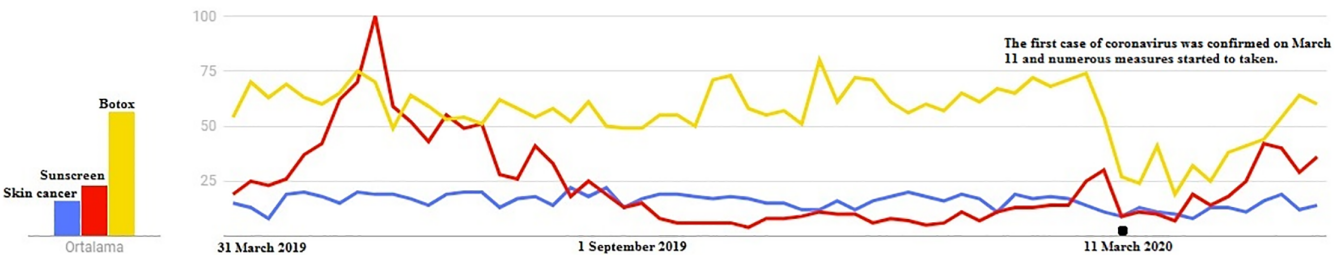


FIGURE 8 Comparison of cosmetology and surgery group with each other in Turkey from March 31, 2019 to June 1, 2020

this study, interestingly, relative changes in search terms were similar between Turkey and Italy after the COVID-19 pandemic. We found that “acne”, “hair loss”, and “eczema” search terms increased after the COVID-19 outbreak both in Turkey and Italy. The relative change in these terms was more prominent in April and May 2020. As compared

to each other, the most common search term among general dermatologic diseases was “eczema” followed by “hair loss” in Turkey, while “acne” was the most common disease followed by “eczema” in Italy. There are some points that should be addressed in this regard. As we know that the enhanced preventive precautions for hand hygiene by

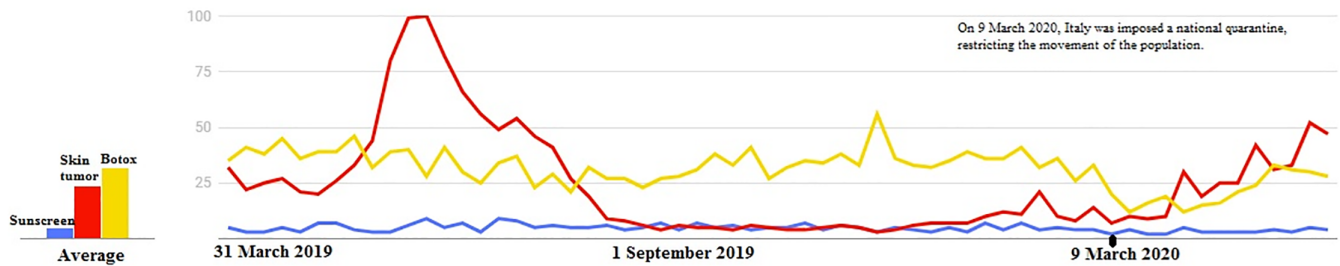


FIGURE 9 Comparison of cosmetology and surgery group with each other in Italy from March 31, 2019 to June 1, 2020

TABLE 1 Correlation between the number of COVID-19 cases in Turkey and search terms of general dermatologic diseases

Search terms	Number of COVID-19	
	Correlation coefficient	P value
Acne	0.677	<0.001
Eczema	0.272	.014
Hair loss	0.536	<0.001

using antiseptics, cologne, liquid soap allows patients to deal with COVID-19.¹⁷⁻¹⁹ However, these measures may result in eczema especially if there is long-term use. In the previous study, we reported that the percentage of eczema was increased after 10 days of the COVID-19 pandemic whereas we found “eczema” search term did not increase during the first month of the COVID-19 outbreak in Google Trends.² This condition may be due to the cumulative effects of the irritating disinfectants and delayed awareness of the public. We also found that “hair loss” and “acne” search terms were increased in both countries in April and May 2020. Both “hair loss” and “acne” may be associated with emotional stress.²⁰⁻²⁴ “Hair loss” search term was at the highest point in the second month of the COVID-19 pandemic in Turkey. Of note, this result may indicate that the short term (<2 months) is more important than the long term in the context of stress period for hair loss.²⁵ However, we can not discriminate whether the exact “hair loss” search term means telogen effluvium, alopecia areata, or other conditions although it is mostly used for telogen effluvium.

An increasing number of “acne” search terms in trends may be related to lockdown measures for young people in both countries. In this regard, we know that Turkey imposed a curfew on youth under 20 on April 4. Thus, it may be the reason why “acne” search term increased from “64” on April 1, 2020, to “90” and “98” on May 1 and June 1, 2020, in Turkey.

Interestingly, we found the positive correlation between the number of COVID-19 cases in Turkey and search terms of general dermatologic conditions including “acne”, “hair loss”, and “eczema”. As the number of COVID-19 cases increased in the country, the number of search terms including “acne”, “hair loss”, and “eczema” increased. The correlation was stronger for “acne” and “hair loss” search terms. In this context, it can be speculated that there may be a strong association

between psychological conditions including stress, anxiety, depression, and hair loss along with acne.^{26,27} It can also be considered that the wide use of face masks may also contribute to the increasing number of acne mechanica during the COVID-19 pandemic.^{2,28}

In this study, “genital warts” and “molluscum contagiosum” search terms were also investigated. In both countries, the level of “genital warts” search term was the lowest point on April 1 and May 1, 2020, however, it increased on June 1, 2020. Furthermore, “genital warts” search term was more common on June 1, 2020, compared to on June 1, 2019. There are controversial studies on genital warts and quality of life.^{29,30} Despite the COVID-19 pandemic, a high number of searches for “genital warts” may show how effective genital warts on public health. On the other hand, the “molluscum contagiosum” search term was the lowest level continuously throughout the COVID-19 pandemic. The significant decrease of venereal diseases search terms during the COVID-19 pandemic may be related to the fact that decreased extramarital sex activity due to social distancing, gathering, and a campaign that directs everyone to “stay-at-home.”¹⁵

Although during 2 months of the COVID-19 pandemic there was a decreasing number of “botox” search terms in both countries, then it increased approximately to the same level of the previous year on June 1, 2020. Despite the stay at home policies, people are still active on social media and continue to share their daily social life during the pandemic. This may be one of the reasons why the “botox” search term keeps its popularity during the COVID-19 pandemic.

Turkey imposed a partial curfew for citizens over the age of 65 on March 21, 2020, apart from lockdown for young citizens.¹² In Italy, the national lockdown started on March 11, 2020.³¹ It is well known that older adults are in a high-risk group for many types of skin cancer.³² Thus, the restrictions policies in order to deal with COVID-19 may have decreased the number of patients who request dermatology outpatient clinic visits for skin cancer hereby “skin cancer” search term in Google Trends. Similarly, “sunscreens” search term can also be considered in this regard. Furthermore, many tourist centers are closed although the summer season is considered to begin. This condition may also contribute to a decrease in “sunscreens” search term.

This study has some limitations. These limitations can be sorted as limited access to the internet in some locations, different language users in different locations. In addition, Google Trends provides observational results.

In conclusion, based on Google Trends searches, our study may serve as an indicator of the popularity of dermatologic conditions

during the COVID-19 pandemic. The search terms including “acne”, “eczema”, “hair loss” appears to be increasing while “molluscum contagiosum”, “genital warts” “botox”, “skin cancer”, and “sunscreen” appears to be decreasing in the era of the COVID-19 pandemic. Understanding the trends and impacts of dermatologic diseases on public perceptions during the COVID-19 pandemic will allow for better preparation of dermatologists.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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