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Article

Health Promotion on Instagram. Descriptive-Correlational Study and Predictive Factors of Influencers' Content

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Abstract: The pandemic has accentuated the power that influencers have to influence their followers. Various scientific approaches highlight the lack of moral and ethical responsibility of these creators when disseminating content under highly sensitive tags such as health. This article presents a correlational statistical study of 443 Instagram accounts with more than one million followers belonging to health-related categories. This study aims to describe the content of these profiles and their authors and to determine whether they promote health as accounts that disseminate health-related content, identifying predictive factors of their content topics. In addition, it aims to portray their followers and establish correlations between the gender of the self-described health influencers, the characteristics of their audience and the messages that these prescribers share. Health promotion is not the predominant narrative among these influencers, who tend to promote beauty and normative bodies over health matters. A correlation is observed between posting health content, the gender of the influencers and the average age of their audiences. The study concludes with a discussion on the role of public media education and the improvement of ethical protocols on social networks to limit the impact of misleading and false content on sensitive topics, increasing the influence of real health prescribers.

Keywords: Influencer; Instagram; health promotion; followers; social media; fake content; media education

1. Introduction and literature review

The current social media scenario has transformed the communicative, informative and social logic [1]. The Internet has altered the means and pace of access to information, entertainment and the storage and dissemination of images, documents and other content. According to data provided by Ref.[2], 83.1% of the population aged between 16-74 years consulted the Internet daily in Spain; this figure rises to 94.5% for users aged between 10 and 15 years.

The speed with which this digital revolution has taken hold has demanded the updating of formal education, as well as the incorporation of this digital competence and, with less curricular presence (though not importance), Media and Information Literacy understood as the preparation for digital life and the development of critical thinking to consume and create media products [3].

According to Ref. [4], Spanish households have, on average, five devices with an Internet connection and young people spend 55% more time online than older people. In Spain, 95% of children use computers and the Internet [5], universalising digital competencies. The report states that the most common online activities involve communicating with others, with 76% using video calls and calls, 79% using e-mail and 90% using instant messaging applications. The use of digital devices and the Internet is becoming essential

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for adolescents, who find in them the motivation to connect on an emotional and social level with other people and to explore their interests in greater depth. 94.8% of Spanish secondary school students have a mobile phone with an Internet connection, and 3 1.6% use it for more than five hours a day to access the Internet and social networks [6].

A decade ago, Gutiérrez and Tyner [3] already highlighted the importance of educators being familiar with social networks for them to be present and to ensure proper and critical use of them. The EUKids Online 2020: Survey points out that, in Spain, the average time a child aged between 9 and 11 spends on the Internet is 2 hours, increasing to 4.5 hours for adolescents aged between 15 and 16 [7]. Additionally, the average age at which children access their first mobile phone is 10.96 years, 4th-5th grade of elementary school, and it is reported that 33% of adolescents may be engaging in harmful use of social networks and the Internet [6].

The normalised use of the Internet, as well as the emergence of new capabilities and lifestyles, means that users of social networks have become either consumers or a reference for other users, mainly the millennial audience [8].

Web users encounter two situations when they perform a range of searches on social networks [9]. On the one hand, information from reliable sources and on the other, misinformation that is neither controlled nor reliable. Several studies [10-12] reveal a new communication ecosystem in which adolescents constantly use social networks for entertainment but also to access information, making the detection of false and malicious content essential.

In this context, Ref. [13] demonstrates the centrality of influencers as prescribers of products and practices that structure, organise and reconstruct their discourse based on the distinction between social classes. This raises questions about identity, aspirations and the effects on the complex adolescent processes of self-affirmation, identity, critical thinking and relationships with peers. Social networks play an essential role in this construction, which is not always considered in formal education.

Different authors have been stating for years that social networks are an opportunity to work on relevant aspects of students' maturity due to their influence on them [14,15]. Along these lines, Ref. [6] state that young people are growing up in a digital and media context, influenced by social networks and enhanced by online education, given the recent health events.

The study by Ref. [16] emphasises the power of social networks based on how the audience of a television programme creates a reality constructed from what happens in the programme, but not restricted to it. Aside from what happens in the TV show, a virtual debate takes place in which everything, from behaviours to the way people dress or their responses to the programme, is analysed. Furthermore, in this research, the lack of critical thoughts and comments on the relationships being formed and broken in the programme is a matter of concern, as it blurs the line between television fiction and the reality of romantic relationships in the eyes of the youngest viewers.

As stated by Ref. [17], preference-based targeted advertising is widespread in the digital world, including social networks and the Internet as a whole, with children and adolescents representing a key audience for brands which seek to attract these age groups through entertainment, games and other actions that are not easily identifiable by users, since they have not been sufficiently educated to do so.

While educational institutions are gradually incorporating new technologies into the classroom, media education is still far from being understood, studied and implemented [18]. Following these authors, it is important to progress along these lines and to do so, and adequate teacher training should be considered as a starting point. It is also worth considering the role of politicians in social networks, whose profiles promote the action-reaction of citizens towards their discourse and favour new political strategies as influencers [8].

The successful business model behind managing a social network profile is becoming increasingly relevant, leading to influencer marketing, as stated by Ref. [19,20], which is

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based on agreements between companies and successful profiles to promote products and brands.

These profiles (influencers) are endorsers, where endorsement is understood as the power of a media individual to recommend the use of a service, product or whatever appears on their social networks [21]. This recommendation works, as users tend to show a preference for those products that are used or recommended by individuals they consider of interest, which they follow on social networks [22]. For Ref. [23], the influencer has the freedom to control the way in which they create content to present on social media, which is often seen as more authentic and engaging by the target audience than if presented directly by the brand. Influence is most effectively exerted by conveying personal opinions about brands in their posts, intervening in the behaviour of the audience, who trust and value their judgement when making purchasing decisions [24-26].

1.1. Social networks and health

The pandemic highlighted the role of social networks in the dissemination of relevant messages [27,28], proving to be of great communicative utility in crisis situations, emergencies and disasters, as occurred during the COVID-19 health crisis [29]. Indeed, this health crisis led to an infodemic situation, understood as the conjunction between information and epidemic [30]. This terminology refers to the excess of information, not necessarily truthful, on a given topic. This reality has led to several solutions from different areas and perspectives, including media, digital and information education [31]. Disinformation and infodemic, especially noticeable in situations such as the COVID-19 emergency, pose complex challenges to be addressed [32], which is why it is important to consider that, some of the factors associated with the growth and spreading of the infodemic, Ref. [33] include:

- Difficulty in searching for and critically selecting reliable information.
- Lack of judgement and tools to obtain accurate information in the right format and at the right time.
- Unawareness of the usage and relevance of health-related digital applications.

During 2020, 61.1% of men and 73% of women in Spain conducted health-related searches on the Internet, in many cases on social networks [2]. As stated by Ref. [9], it is becoming increasingly common for patients and relatives to inform themselves in advance and go to medical appointments with certain knowledge they have found in unreliable sources on the Internet and social networks or assuming that the information that influencers have posted on their profiles is true. It should be noted that an influencer may promote or suggest a product without providing all the necessary information, making potentially misleading recommendations that could negatively affect the consumer, intentionally or unintentionally [34]. To mitigate this, the Spanish Ministry of Health, Consumer Affairs and Social Welfare offers a guide for the advertisement of medicines for human use [35]. Its purpose is to provide the general public with information on medicines that do not require a medical prescription, as there is no prior control of the information provided through advertising, but this does not imply that all messages or conduct regarding such medicines are authorised [36]. This surveillance already exists in the traditional media, assuming, as indicated by Ref. [37], social

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responsibility in the alleged veracity of the information offered by mass communication professionals, given its educational and informative purpose, which should be a priority. However, this responsibility is uncertain when it comes to the new opinion leaders in social media.

The network's users who have their own profile can select topics or categories about which the content they create and share is based on. In the case of Instagram, the categories are: artist, musician/music band, blogger, clothing (brand), community, digital creator, education, entrepreneur, health/beauty, editor, writer, personal blog, product/service, gamer, restaurant, beauty/cosmetics and personal care, food shop, photographer, retail sales and purchases, and lastly, video creator.

The categories of fashion and beauty are two of the areas that attract the most interest from the audience, generating deals and sponsors for the content creators. This is what makes it particularly interesting to investigate the audiences, according to Ref. [38] , in order to assess the trends across the different networks in terms of shopping recommendations and the audience that is most attracted to them.

Further research is needed to improve the ethical standards of media and media education to differentiate what is truthful and rigorous from what is mere entertainment, also aiming to avoid real-life harassment situations derived from the characters appearing in different television programmes, by learning to discern between reality and fiction, the character and the person [16].

2. Objetctives and method

To this end, this study has the following objectives:

1. To describe the contents of self-proclaimed health influencers on Instagram and their authors, as well as to identify their main followers (age and gender profile).
2. Determine the extent to which these accounts provide genuine health content to verify whether, as profiles that disseminate health information, they promote health to a high degree.
3. Determine what factors (gender and age range of the influencer and predominant gender of their followers) influence the publication of health content on these accounts.

To meet the aims of this study, an instrument that provides an international ranking of theme-based influencers was used. Due to the large number of records collected, the Starngage tool allowed the identification of Instagram profiles classified under the health category (Figure 1). All the accounts with more than 1,000,000 followers were processed. A comparative analysis of the results obtained by the tool was carried out, compiling records of the most-followed social media profiles on Instagram in 39 countries. Stangage defines itself as a "marketplace for content creators" that connects "brands with wonderful content creators from different channels and media". They understand that "socially distributed visual content is the future of advertising" [39]. It is an interactive archive of the Instagram accounts with the most followers and engagement.

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The platform has expanded to YouTube and TikTok over the past year; however, Starngage does not include a large volume of accounts nor the complete data from these two platforms as it is still in beta version on both of them, which is why its results have not been included in the present study.

When using the tool to narrow the search results to the health category alone, 67,375 global influencer profiles were found (Figure 2), ranked from highest to lowest follower count. The search, conducted on 14 September 2022, yielded 66542 influencer profiles from Instagram, TikTok and YouTube. After setting the minimum number of followers to 1,000,000, with no maximum number of followers, 443 entries were obtained that constitute the final sample.

Each Starngage profile provides a wide range of data about the owner of the profile and their interaction with the audience, among other details (Figure 1).

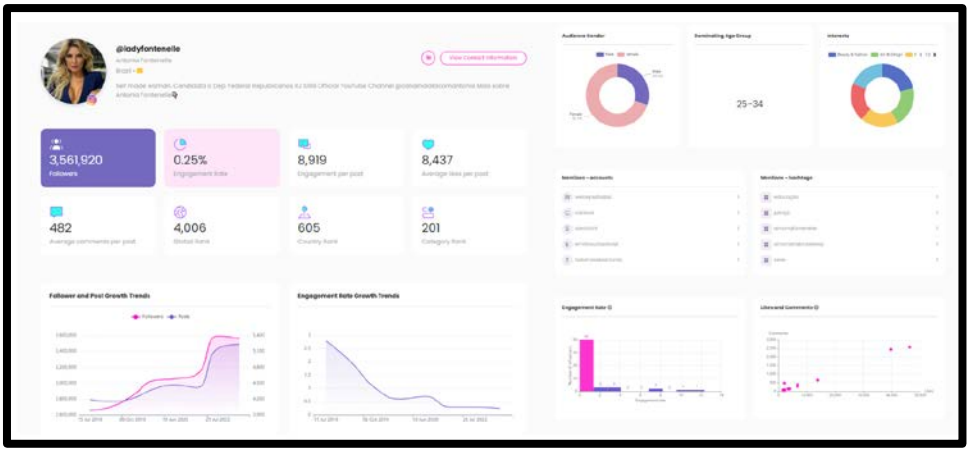

Figure 1. Instagram profile of @ladyfontenelle on Starngage (retrieved 4 October 2022). Source: Starngage.com

The variables included in the Codebook (Table 1) have been quantitatively processed for each of the accounts that comprise the sample of this study: (1) gender of the influencer, (2) percentage of female followers, (3) percentage of male followers, (4) predominant age range of the followers (for this variable only two possible ranges have been considered, 18-24 and 25-34 years since these are the ones provided by Starngage and also coincide with the interests of this study, focused on the younger population), (5) audience interests and (6) type of content. To determine the content typology of each account, 18 categories have been established, which have been coded and identified by analysing the last six publications of the profile in the corresponding social network.

Table 1. Codebook. Source: Own elaboration.

Variable	Category
1. Influencer gender	Male Female
2. % female followers	Quantitative variable
3. % male followers	Quantitative variable

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4. Follower interests	Beauty
	Music
	Fitness
	Travel
	Business
	Art and design
	Children and family
	Cars
	Entertainment
	Food and restaurants
	Movies and TV
	Sports
	Photography
	Not identified
5. Follower age range	18-24 years
	25-34 years
6. Content published by the influencer	Brands
	Normative body
	Healthy foods
	Unhealthy foods
	Health tips
	Swimwear or underwear
	Eroticism
	Beautiful person
	Non-normative body
	Family
	Pregnancy
	Sport
	Beauty tips
	Memes and virals
	Bodybuilding
	Hospital environment
	Cooking recipes
	Other

The resulting database has been processed using the SPSS tool through a bivariate correlational analysis with the variables included in the object of study.

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3. Results

3.1. General data

Of the 443 accounts analysed, 66.4% (n=294) belong to women and 27.1% (n=120) to men. The gender of a total of 29 profiles (6.5%) could not be identified. There are more accounts with a predominant follower age range between 25 and 34 (n=278; 62.8%) than those followed by users aged between 18 and 24 (n=109; 24.6%). No data was available on the follower age range for a total of 56 profiles (12.6%). It should be noted that only two age ranges were included (18-24 and 25-34). As for the gender of the users, the sample analysed was very balanced, with 50.4% of the followers of the profiles studied being male, and 49.6% being female. The users of these profiles are mostly interested in the beauty category (n=213; 48.1%), with fitness (n=57; 12.9%) and entertainment (n=26; 5.9%) as the second and third most prevalent topics (Table 2).

Table 2. Interests of the followers of the influencers analysed. Source: Own elaboration.

Follower interests	**n**	**%**
Beauty	213	48,1
Music	18	4,1
Fitness	57	12,9
Travel	7	1,6
Business	1	0,2
Art and design	12	2,7
Children and family	13	2,9
Cars	2	0,5
Entertainment	26	5,9
Food and restaurants	18	4,1
Movies and TV	12	2,7
Sports	2	0,5
Photography	1	0,2
Not identified	60	13,5

3.2. Content analysis

Health-related content in the accounts observed is minimal (Table 3). The influencers studied included references to healthy foods in only 1.5% of their posts (n=21). They posted about unhealthy foods in 1.3% of occasions (n=18). Health advice was present in 2.2% of publications (n=31). Sport is mentioned in 5.4% (n=75), pregnancy in 0.6% (only in 8 publications) and hospital environment in 0.3% (4 publications). However, content about normative bodies (172; 12.3%), brands (n=163; 11.7%), swimwear or underwear images (n=139; 9.9%) or beauty (n=139; 9.9%) was more frequent.

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Table 3. Content published by the influencers analysed. Source: Own elaboration.

Content	n	%
Brands	163	11,7
Normative body	172	12,3
Healthy foods*	21	1,5
Unhealthy foods*	18	1,3
Health tips*	31	2,2
Swimwear or underwear	139	9,9
Eroticism	67	4,8
Beautiful person	1	0,1
Non-normative body	17	1,2
Family	52	3,7
Pregnancy*	8	0,6
Sport*	75	5,4
Beauty tips	16	1,1
Memes and virals	10	0,7
Bodybuilding	25	1,8
Hospital environment*	4	0,3
Cooking recipes	12	0,9
Other	429	30,7

*Health-related content

Hypothesis testing using chi-square tests found highly significant differences in the distribution of content by gender [X2=(19, N=1398)=170.574, p<.001]. Female influencers share more posts about healthy food than male influencers (Table 4), as 1.5% of the content posted by female influencers falls into this category compared to 0.7% for male influencers. However, male influencers publish more unhealthy food references (2.1% compared to 0.5% for female influencers). A greater deviation is observed regarding health tips, a category covered in 4.2% of men's posts and only 1.5% of women's posts. Men also incorporate more sport content (10.6%), representing 6.2% of the content posted by women.

For content not related to health, there are notable gender differences in the "brands" category (predominantly posted by men: 23.2% compared to 12.4% by women), "normative bodies" (more content shared by female accounts: 19.2% compared to 10.9% by male accounts) and "beautiful person" (higher proportion shared by female accounts: 16.8% compared to 5.6% by male accounts).

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions that can be drawn.

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Table 4. Type of content published based on the influencer's gender. Source: Own elaboration.

Content	Female**	Male**
Brands	90 (12,4%)	66 (23,2%)
Normative body	140 (19,2%)	31 (10,9%)
Healthy foods*	11 (1,5%)	2 (0,7%)
Unhealthy foods*	4 (0,5%)	6 (2,1%)
Health tips*	11 (1,5%)	12 (4,2%)
Swimwear or underwear	116 (15,9%)	22 (7,7%)
Eroticism	62 (8,5%)	4 (1,4%)
Beautiful person	122 (16,8%)	16 (5,6%)
Non-normative body	16 (2,2%)	1 (0,4%)
Family	40 (5,5%)	12 (4,2%)
Pregnancy*	8 (1,1%)	0
Sport*	45 (6,2%)	30 (10,6%)
Beauty tips	9 (1,2%)	3 (1,1%)
Memes and virals	4 (0,5%)	4 (1,4%)
Bodybuilding	9 (1,2%)	16 (5,6%)
Hospital environment*	1 (0,1%)	3 (1,1%)
Cooking recipes	7 (1%)	2 (0,7%)

*Health-related content

**The percentage refers to the prevalence of content posted for each category according to the gender of the influencers.

There are also very significant differences in terms of content distribution of the influencers analysed according to the age of their followers [X2=(19, N=1398)=35.127, p<.013]. Overall, a greater interest in health topics is observed in those accounts with a majority of followers between the ages of 25 and 34, which is the oldest age range analysed in this study (Table 5). Influencers with a higher number of followers in the 25-34 age range share more content about unhealthy food (2.5%) than those whose followers are between 18 and 24 (1.2%). They also give more health advice (3.4% vs 0.8%) and post almost twice as much content about sports (8.5% vs 4.4%). The only health-related category favoured by accounts followed by the younger age group is "pregnancy", representing 0.8% of the content from accounts followed mainly by users between the ages of 18 and 24, compared to 0.6% from accounts with a majority of followers aged between 25 and 34.

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Table 5. Type of content published according to the predominant age range of the influencer's followers. Source: Own elaboration.

Content	18-24**	25-34**
Brands	36 (14,5%)	105 (15,4%)
Normative body	49 (19,8%)	102 (15%)
Healthy foods*	3 (1,2%)	17 (2,5%)
Unhealthy foods*	2 (0,8%)	16 (2,4%)
Health tips*	2 (0,8%)	23 (3,4%)
Swimwear or underwear	32 (12,9%)	91 (13,4%)
Eroticism	10 (4%)	46 (6,8%)
Beautiful person	42 (16,9%)	85 (12,5%)
Non-normative body	4 (1,6%)	11 (1,6%)
Family	13 (5,2%)	30 (4,4%)
Pregnancy*	2 (0,8%)	4 (0,6%)
Sport*	11 (4,4%)	58 (8,5%)
Beauty tips	5 (2%)	7 (1%)
Memes and virals	2 (0,8%)	4 (0,6%)
Bodybuilding	2 (0,8%)	19 (2,8%)
Hospital environment*	0	3 (0,4%)
Cooking recipes	2 (0,8%)	10 (1,5%)

*Health-related content

**The percentage refers to the prevalence of content posted for each category by the influencers according to the predominant age range of their followers.

3.3. Correlational study and predictive factors of the type of content

To further explore the data, a bivariate correlational study was carried out between the different variables under study. Prior to this, and to determine whether to apply parametric (Pearson's test) or non-parametric (Spearman's test) calculations in the analysis of the correlations, the normality of the sample was verified using the Kolmogorov-Smirnov test, which found an absence of normality in the distribution of values in the sample, so it was decided to apply non-parametric tests (Spearman's rho coefficient) for the correlational study.

The variables for which correlations were analysed are: (1) "gender", (2) "percentage of women following the account", (3) "percentage of men following the account" and (4) "predominant age range of followers". To these variables, a dichotomous dummy variable called "type of content" was added, coded as follows:

- Content not related to health. Groups together all categories of the "content" variable that do not refer to health-related aspects (e.g. brands, normative bodies, beautiful person, memes and virals, swimwear or underwear, etc.). Value assumed by this category of the variable: 0.

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- Health-related content. Groups the following categories of the "content" variable: (1) healthy food, (2) unhealthy food, (3) health tips, (4) pregnancy, (5) sport and (6) hospital environment. Value assumed by this category: 1.

Table 6 shows the complete correlational study of these five variables. The following data are relevant:

- Highly significant correlations are observed in a positive sense (although with weak intensity) between gender and the presence of health content (rho(1398),=.102 p=.001). In this case, the fact that the influencer is male is significantly associated with the publication of health-related content.
- Again, the calculations also find a highly significant positive (but equally weak) correlation between accounts with a majority of followers aged between 25 and 34 and the publication of health-related content (rho(1398),=.120 p<.001).

Table 6. Correlational study. Source: Own elaboration.

	Gender (p)	**% Females (p)**	**%Males (p)**	**Age range (p)**	**Type of content (dummy) (p)**
Gender (p)		-.059 (.079)	.059 (.080)	-.065 (.052)	.102 (<.001)
% Females (p)			-1.000 (.000)	-.327 (<.001	.059 (.073)
%Males (p)				.328 (<.001)	-.059 (.071)
Age range (p)					.120 (<.001)
Type of content					

Given the existence of variables (gender and age range) that correlate in a statistically significant way with the posting of health-related content, a multiple linear regression test was performed in order to determine to what degree these independent variables (gender and age range) predict the behaviour of the dependent variable (type of content). To this end, a stepwise linear regression test was conducted, which confirmed that the two independent variables are predictors of health-related content in the accounts analysed (Table 7). The factor that best predicts the posting of health content is the predominant age range of the followers ($\beta = .125$, $p < .001$), before the gender of the influencer ($\beta = .101$, p=.003). However, it is observed that, based on the last step, the model has a low predictive capacity for the behaviour of the "type of content" variable (R2 =.024; R2adjusted =.022) [R =.156, F(1, 1398) =10.88), $p < .001$]. The model predicts the publication of health-related content by 2.2%.

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Table 7. Predictor variables for type of content. Source: Own elaboration.

Step	Predictor variable	rho Spearman	Standarised coefficient(®)	p
1	Age range	.120*	.119	<.001
2	Age range		.125	<.001
	Gender	.102*	.101	.003

Model summary (last step)			
F	**p**	**R**	**R2 (R2adjusted)**
10.88	<.001	.156	.024 (.022)
Significance of correlation coefficients (rho): * p<.001.			

4. Discussion and conclusions

This study examined the 443 health accounts with the largest global reach on Instagram. In 90% of cases, these accounts did not publish any health-related content. Most of the followers of the accounts that allude to a healthy lifestyle are between 25 and 34 years old, and these profiles are mainly of male users.

As for the rest of the content included within the health category but unrelated to it, there is a prevalence of brands, especially in the profiles of male users and of normative bodies among female instagrammers.

Although health tips are more often posted by women, the other topics related to healthy living are, in general, published more often by men. Together with the fact that the majority of followers belong to the 25-34 age group, this is a predictive factor for health-related content on Instagram. Indirectly, this finding offers the opportunity to investigate more content variables, while also assessing the complexity of this parameter and its limited contribution as a predictive factor.

While the study did not aim to address the aesthetic-normative and sexual content in health accounts on Instagram, this parameter was present in the analysis, and the data show a notable difference between the prevalence of content on normative bodies, beauty and/or eroticism published in male (17.9%) and female (44.5%) influencer profiles. This aspect should lead to further analysis in future studies.

While it is not a direct objective of this study, it would be useful to delve into the algorithms that manage the content on Instagram or other platforms to understand the effect and direct implication that the network itself has on the thematic classification and what users can or cannot expect from it. There are certain categories, such as education or health, which may be of interest to users. As such, those profiles with a significant number of followers should be supervised to ensure that the content shared corresponds to the category assigned by the influencers themselves.

The lack of ethical responsibility in social networks can be particularly conflictive when it comes to areas such as health, given the growing trend of consuming, consulting and referring to these platforms among the population. By identifying accounts with a high reach in the field of health, and analysing their content, it becomes clear that the

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publications of these accounts do not coincide with healthcare guidelines or habits, but rather feature images and videos that promote beauty, normative bodies and advertising. Young people are increasingly becoming both senders and receivers of online content and, interacting on social networks is the second most frequent activity during the average three hours that a child between 9 and 16 years old spends on the Internet daily in Spain, excluding educational activities [7].

Given this circumstance, digital platforms should improve the control mechanisms for theme-based profiles with the highest engagement and number of followers, avoiding, as far as possible, intrusive content interfering with sensitive topics such as health. Future research lines are proposed to further examine these disinformation practices in other knowledge areas, such as education on different platforms, especially on YouTube and Instagram. It would be advisable to examine the rigour and reliability that followers of these areas perceive from the accounts that belong to them, and to evaluate these types of classifications in order to improve the user experience on social networks.

Finally, it is worth questioning the transcendence of some of the results of this study, especially the widespread and indiscriminate consumption of content about brands and normative bodies. What effects are these messages having on the development of our young people's identities? Educommunication experts have already acknowledged the importance and influence of this type of messages for the establishment of social media and for the kind of referents that children [40] and young people are adopting as a result of the regular consumption of content with such commercial manifestations. Programmes that adapt educommunication in basic education and further develop a critical attitude towards this type of content could be of particular interest, including an evolutionary approach that allows to examine how the implementation of existing educommunication curricula, such as UNESCO's Media and Information Literacy [41], affects the critical education of the younger population. Undoubtedly, educational policies should include educommunication programmes that examine these aspects in depth and allow users to interact freely and critically with social networks.

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