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#Scoliosis: an analysis of patient perception of scoliosis on TikTok

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ABSTRACT

Background: Social media presents an opportunity to analyze popular opinion about patient experiences. Idiopathic scoliosis is a spinal pathology commonly identified in younger patients who are the largest users of social media.
Objective: To analyze posts on the social media platform, TikTok, to better understand the scoliotic patient condition.
Methods: TikTok posts were searched manually by screening for "#Scoliosis." Variables assessed included number of likes, conveyed tone, gender, activities of daily living, incisional scar, imaging, involved spine level, spinal curvature, pain, formal physical therapy, multiple operations/reoperation, brace use, self-image, mobility, and educational/awareness posts. Number of responses per category were evaluated for the total they represented and the percentage of available posts containing those elements. Odds ratios with 95% confidence intervals were calculated for each collected variable.
Results: More posts were positive than negative ($P < 0.001$) and from female users than male users ($P < 0.001$). Self-image was the most prevalent subject, with many posts not mentioning activities of daily living, incisional scars, imaging, pain, physical therapy, timing, awareness/education, or involved spine levels.
Conclusions: More females post about scoliosis than males, with most posts containing positive self-image–related themes. This may represent a positive public attitude about scoliosis; however, further research is needed.

Social media has become an increasingly popular medium for communication over the past several decades. Today, there are many social media platforms through which thoughts/opinions are shared about everything across the spectrum of topics, and social media utilization is becoming increasingly widespread with the spread of internet accessibility. From a medical perspective, social media presents a massive opportunity to analyze huge amounts of readily available "randomized" public information about various aspects of the patient experience. Idiopathic scoliosis is a spinal pathology commonly identified in younger patients who, in 2021, were the largest users of social media.[1,2] To this end, harvesting data from social media platforms may allow a better understanding of patients' subjective experiences with medical interventions and the predominant public opinion about them. In this paper, we aimed to identify what patients discuss the most with scoliosis by looking at posts on the social media platform TikTok. By analyzing patient posts, we hoped to gain a better understanding of the condition and if providers may do anything differently to alter the patient experience. Our hypothesis was that the overall opinion about scoliosis would be negative but that the opinion about its treatment would be positive.

METHODS

This study utilized publicly available posts on TikTok; therefore, no institutional review board approval was necessary. Posts were searched manually by two reviewers by screening for "#Scoliosis." The first screen included posts where patients were posting about their experiences related to surgical intervention for scoliosis. Posts could be

preoperative, postoperative, or both. Excluded posts included physician accounts and accounts advertising for physicians. Any post unrelated to scoliosis and the patient experience during data extraction was also excluded. Variables assessed included total number of likes (numeric), conveyed tone (positive/negative), and gender (male/female). The following surgical commentaries were assessed for their presence in a yes/no format: activities of daily living (ADL), incision/scar, imaging, level of spine involvement (i.e., lumbar, thoracic), spinal curvature (in degrees), pain, formal physical therapy, multiple operations/reoperation, use of a brace as form of treatment (including if their post was about using the brace versus not wearing the brace anymore), self-image, patient mobility, and posts intended to educate others or increase awareness about scoliosis. Each recorded post represented one patient's experience. Posts were allowed to contain more than a single variable. All data were collected in May 2021.

Descriptive statistics were performed in Microsoft Excel. The total number of responses per category was measured and the percentage that those posts represented (of available posts containing those elements) was calculated ([posts with interest variable]/[total included posts] × 100). All variables were evaluated with a chi-square test related to the overall tone of the post. Odds ratios with 95% confidence intervals ($\alpha = 0.05$ was considered significant) were calculated for each collected variable.

RESULTS

Overall, 800 posts were found that met the inclusion criteria. The average number of likes per post was 72,880, with more posts being positive than negative (59.1 versus 40.9%, respectively, $P < 0.001$) and vastly more posts coming from female TikTok users than male users ($P < 0.001$). Regarding the collected variables, self-image was by far the most common subject in the posts (78.5%). ADLs was the second most present, and bracing was third (Table 1). A significant number of posts did not mention ADLs, incisional scar, imaging, pain, physical therapy, timing, or level of spine involvement and were not made to educate/increase awareness about scoliosis. Among the variables found to be significant, posts about pain, physical therapy, or education/ awareness were found to have the smallest P values (all <0.001). Posts about reoperation, brace, curve, or mobility were not found to be significantly present among the posts filtered (Table 2).

DISCUSSION

Overall, most posts reflected positive themes about scoliosis. The possible discrepancy between male and female posts could be due to the increased incidence of idiopathic scoliosis among women over men.[3] This may also have to do with female preference for social media sites that are more visually based, while male users favor text-based sites.[4] Furthermore, an investigation by Facebook found that female users tended to share more personal issues while male users preferred to

Table 1. Patient post statistics on TikTok for the assessed study variables

Variable	Present	Absent
Likes (average)	72,880	
Positive	454	
Negative	314	
Male	72	
Female	696	
Activities of daily living	244	526
Incision/scar	75	695
Imaging	169	601
Pain	168	602
Physical therapy	56	714
Reoperation	14	756
Timing	210	558
Brace	230	538
Curve	71	698
Level of spine	152	616
Mobility	171	597
Made to educate/increase awareness	151	619
Self-image	603	167

Table 2. Odds ratio, confidence interval (95%), and chi-square test P values for collected variables related to scoliosis on TikTok

Variable	Odds ratio	95% CI	P value
Activities of daily living	1.53	1.11–2.10	**0.008**
Incision/scar	1.88	1.11–3.19	**0.017**
Imaging	0.59	0.42–0.84	**0.003**
Pain	0.33	0.23–0.47	**<0.001**
Physical therapy	4.52	2.53–8.07	**<0.001**
Reoperation	0.92	0.32–2.68	0.880
Timing	1.65	1.18–2.30	**0.003**
Brace	1.23	0.95–1.60	0.122
Curve	0.65	0.40–1.05	0.077
Level of spine	0.55	0.39–0.79	**0.001**
Mobility	1.51	1.06–2.16	0.023
Made to educate/increase awareness	1.92	1.30–2.83	**<0.001**
Self-image	0.58	0.40–0.84	**0.003**

Bold indicates less than 0.05 which was the cut-off P value for significance.

post more about abstract topics.[4] This may help explain the gender dominance of females in our study and the fact that self-image was the strongest topic in our study on TikTok, a visually based social media platform.

It's also interesting to note the average number of likes for each post. This number is a testament to the reach of social media to other people and is said to be more effective than celebrity endorsement for small and medium-sized enterprises.[5] For practicing medical professionals who work with preoperative and postoperative scoliosis patients, it is apparent that addressing the patient's self-image is exceedingly important to the well-being of the patient as well as, potentially, the public image of the practice the patient has chosen for treatment. In the context of self-image being the most discussed topic among scoliosis TikTok users, depression becomes an important topic to consider. One study found that patients with adolescent or juvenile idiopathic scoliosis (AIS or JIS, respectively) undergoing bracing were more vulnerable to depression, with a preponderance of female patients suffering.[6] Another study found an association between AIS and mental health issues, while a similar nationwide study conducted in Taiwan found an increased risk of depression among patients with scoliosis.[7,8] Gallant et al found that body image represented the most important link between psychosocial difficulties and AIS and that self-image was a significant prognostic factor for successful patient outcome in AIS.[9]

On a different note, we found that pain was not significantly mentioned in posts; although impossible to determine from a public forum like TikTok, that may imply that posters had less severe scoliosis pathology. Despite this, back pain still serves as an important link to self-image, as a level II study found that biopsychosocial factors were associated with the presence and severity of back pain in AIS patients.[10] In this light, for scoliosis patients with back pain, it may be appropriate to treat pain as well as any signs of depression or declining self-image in a new sort of patient-centered approach. A 2021 systematic review by Hirase et al found that duloxetine was a viable first-line option for patients with chronic back pain; it may serve as a more effective alternative to long-term anti-inflammatory analgesics since it can concomitantly address depressed mood.[11] Similarly, other studies have found that duloxetine provided clinically meaningful reduction in back pain, similar to nonsteroidal anti-inflammatory drugs, was well tolerated, and was able to treat both neuropathic and nonneuropathic pain.[12–14]

Overall, our study found that included posts carried a more positive than negative tone. However, this finding should be interpreted carefully as Goanta et al found that in the public realm of social media, individuals may be subject to various social pressures that opacify the transparency of the truthful opinion of the posting individual.[15] Alternatively, a portion of the positive posts may represent a positive experience with treatment, as surgical treatment can lead to improved self-esteem and satisfaction.[16]

Altogether, our study represents data that, to our knowledge, has not been previously utilized to provide insight for medical practitioners to possibly improve scoliosis patient satisfaction. Namely, accessing public posts of their patients may provide practitioners an opportunity to risk stratify or identify patients who may need treatment augmented with psychological components for more successful treatment.

All data were gathered and interpreted manually, so there is a subjective component to classification of the posts between collectors, which can introduce observer bias. Scoliosis' higher prevalence in women can account for the large number of posts from women. Furthermore, given that social media platforms are a social forum where social factors like ridicule, popularity, and other intangible psychosocial variables exist, there is the possibility for a type of Hawthorne bias derivative where posting users might skew their posts a certain way to avoid certain social ramifications. Additionally, TikTok provides financial compensation for users who meet certain follower requirements for their posts. If any users received financial compensation from TikTok, there is a possibility that this may have provided a pressure to embellish posts, which might skew results regarding the number of variables filtered.

In conclusion, there were more female TikTok user posts about scoliosis than male user posts, with a significant number of posts containing self-image–related subjects and a significant number of posts that did not mention ADLs, incisional scars, imaging, pain, physical therapy, timing, or levels of involved spine. Furthermore, a significant number of those posts contained positive versus negative themes. This may represent a positive public attitude about scoliosis pathology; however, further research is needed.

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Avocations

"Before it happens." Photo by Alejandro C. Arroliga, MD. Dr. Arroliga (Alejandro.Arroliga@BSWHealth.org) is chief clinical innovation officer of Baylor Scott & White Health and regional dean of the Baylor College of Medicine regional campus in Temple, Texas.