Social Networking Sites for Peer-Driven Health Communication: Diabetes-Related Communities in Google+

Yuhei Mogi^{1,2} · Tasnima Abedin¹ · Salim Ahmed¹ · Gurleen Gill¹ ·
Mohammad Al Mamun³ · Hideyuki Kanda⁴ · Yoshihiro Ishikawa² ·
Tanvir C. Turin¹

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Abstract

Objective Google+ is one of the most actively used Social Networking Sites in the world. The aim of our study is to characterize the Google+ communities related to diabetes and identify the factors associated with the activity level of these communities.

Methods We conducted a systematic search for diabetes-related Google+ communities. We categorized the principal objective of eligible communities into six themes: (1) awareness creation, (2) providing support and sharing experience, (3) product or service promotion, (4) diet-related topics, (5) exercise-related topics, and (6) others. The themes for the posts were: (1) asking for information, (2) providing information, (3) expressing emotion, and (4) advertisement.

Results We included 145 Google+ communities and 378 posts for analysis. Majority (80.0%) of the communities were focused on “General Diabetics”, 11.8% were focused on “Type 1 diabetes”, 6.2% were focused on “Type 2 diabetes”, and 2.1% were focused on “Gestational diabetes”. Majority of the communities (35.2%) had the

principal objective “Provide support and share experience”. Regarding the user-generated posts, 29.6% posts had at least one “+” (“+” is similar to “like” in Facebook), 17.7% posts had comments, and 89.2% posts had external links. Majority of the posts (69.6%) were focused on “General diabetes”, 16.9% were focused on “Type 1 diabetes”, 12.4% were focused on “Type 2 diabetes” and 1.15 were focused on “gestational diabetes”. The top two themes of the posts were “Providing information” (72.8%) and “Advertisement” (31.5%).

Conclusion Our study revealed that major activity of diabetes-related Google+ communities was related to providing support and information. However, the accuracy and effectiveness of the information in the communities need to be scrutinized further from clinical perspective.

Keywords Diabetes · Social media · Health communication · Google+

Introduction

Diabetes is the seventh leading cause of death worldwide [1], and currently up to 9% of the world’s population over the age of 18 suffer from diabetes. Clinical treatment as well as lifestyle choices play a crucial role in the management of diabetes. Due to the rising popularity and easy accessibility of social networking sites (SNS), patients and caregivers often use this platform to seek and share disease-related information and support.

Google+ is one of the most actively used SNS in the world, with 120 million monthly active members [2] who can communicate with each other through posts and comments. There have been a few studies of user-driven peer support in social media regarding diabetes. However, no

✉ Tanvir C. Turin
turin.chowdhury@ucalgary.ca

¹ Department of Family Medicine, Health Sciences Center, University of Calgary, Room G012F, 3330 Hospital Drive Northwest, Calgary, AB T2N 4N1, Canada

² Cardiovascular Research Institute, Yokohama City University School of Medicine, Yokohama, Japan

³ Department of Public Health, General Directorate of Health Affairs in Tabuk Region, Ministry of Health, Tabuk, Kingdom of Saudi Arabia

⁴ Department of Environmental Medicine and Public Health, School of Medicine, Shimane University, Shimane, Japan

Fig. 1 Process of searching for diabetes-related Google+ communities and posts for analysis

studies exploring this issue in Google+ communities have been reported. The aim of the study reported here was therefore to characterize the diabetes-related Google+ communities and to identify the factors associated with the activity levels of these communities.

Methods

On April 22, 2015, we conducted a systematic search to identify all diabetes-related Google+ communities. A total of 312 communities were identified using the search term “diabetes.” We excluded communities that were private, not related to diabetes in humans, not in English, and focused on multiple diseases (Fig. 1). Information such as the title and subtitle of each community as well as descriptions of the communities provided by their members were collected. Furthermore, 676 posts dating from January 22, 2015 to April 22, 2015 were also collected from the eligible communities, and information such as the date posted, the content of the post, URLs of external webpages and pictures linked to in the post, the number of likes

(“+”) garnered by the post (each “+” indicates that a member of the community appreciates the post), the number of times that the post was shared, and the number of comments that the post attracted was recorded.

We excluded posts that were not in English, not related to diabetes, and had dead links or irrelevant links to other webpages. A coding scheme was developed based on a pilot study of 80 randomly selected community descriptions and 200 randomly selected posts. The coding scheme led to six thematic categories for the communities and four thematic categories for the posts. The thematic categories for the communities were: (1) awareness creation, (2) providing support and sharing experiences, (3) product or service promotion, (4) diet-related topics, (5) exercise-related topics, and (6) others. The thematic categories for the posts were: (1) asking for information, (2) providing information, (3) expressing emotion, and (4) advertisement. Examples of the thematic categories for community description and post content are shown in Table 1.

Two researchers (Y.M. and G.G.) categorized the communities and the posts according to this coding scheme. Any disagreement between the reviewers during the categorization process were solved by discussion until a conclusion was reached. These disagreements occurred in relation to the community categories of “awareness creation” and “providing support and sharing experiences.” Communities categorized under “diet-related topics,” “exercise-related topics,” and “product or service promotion” did not prompt any reviewer disagreements.

All eligible communities were also divided into two groups based on level of activity: “active” (the most recent post or comment was posted on or after January 1, 2015) and “less active” (the most recent post or comment was posted before January 1, 2015). The absolute frequency and percentage were calculated for each variable. Backward stepwise logistic regression was used to identify the factors associated with Google+ community activity level. Variables with a level of significance $P < 0.10$ were considered for inclusion in the base model for multivariable logistic regression analysis. Unadjusted and adjusted odds ratios were calculated along with 95% confidence intervals. $P < 0.05$ was considered to indicate significance in the final model. The Hosmer–Lemeshow test was used for model diagnostics. All analyses were performed using SPSS version 20 (IBM Corporation).

Results

Upon applying our inclusion criteria, 145 Google+ communities and 378 posts were selected for analysis (Fig. 1). Table 1 describes the general characteristics of

Table 1 Characteristics of the diabetes-related Google+ communities and posts

Characteristics of the communities			
Characteristics	Example	Frequency	(%)
Geography			
Global	—	137	(94.5)
Regional	—	8	(5.5)
Diabetes type			
General diabetes	“For those supporting diabetes (as in finding a cure), patients of diabetes, and friends or family of diabetics.”	116	(80.0)
Type 1 diabetes	“Whether you’re a new onset, have been diagnosed a long time, a parent, brother, sister, friend, or neighbor of a diabetic...join our community to support T1D awareness. Post pictures, talk about your personal dealing with it, or find news articles related to diabetes for everyone to see! We are all here to be supportive and be there for one another! Sometimes all you need is a good laugh, other times you’d rather educational information! We want to be both here!! We need everyone’s support and input to make that work!”	17	(11.7)
Type 2 diabetes	“We suggest the permanent solution for the people suffering from Diabetes Type 2”	9	(6.2)
Gestational diabetes	“You CAN have a healthy pregnancy and have GDM! Share your successes and challenges in a supportive group setting. Learn how food affects your blood sugar.”	3	(2.1)
Themes of the communities based on their principal objectives ^a			
Awareness creation	“Join our community to support T1D awareness.”	17	(11.7)
Providing support and sharing experience	“This community is for all those who would like to share their experiences and knowledge of their diabetes.”	51	(35.2)
Product and service promotion	“Cheryl Farley Wellness is a proven health recovery program that can reverse type 2 diabetes in 10 days.”	22	(15.2)
Diet-related topics	“This community is for all those who would like to share their experiences and knowledge of their diabetes.”	30	(20.7)
Exercise-related topics	“All those prone to diabetes to engage in sports and exercise.”	24	(16.6)
Others	“A discussion forum for developments of Artificial Pancreas systems for Type 1 diabetes.”	31	(21.4)
Level of activity			
Active (latest activity on or after January 1, 2015)	—	64	(44.1)
Less active (latest activity before January 1, 2015)	—	81	(55.9)
Characteristics of the posts			
Likes (“+”)			
At least one “+”	—	112	(29.6)
No “+”	—	266	(70.4)
Comments on the post			
At least one comment	—	67	(17.7)
No comments	—	311	(82.3)
Presence of external link in the post			
Yes	—	337	(89.2)
No	—	41	(10.8)
Theme(s) of the post ^a			
Asking for information	“What do you think? True or False. There is no link between sleep and diabetes. Submit your response on the link and find the explanation. http://dovemed.com/trivia/true-or-false-there-is-no-link-between/ ”	24	(6.3)
Providing information	“Smoking can put your health at risk in a variety of ways. It can put you at a high risk for type 2 diabetes.”	275	(72.8)

Table 1 continued

Characteristics of the communities			
Characteristics	Example	Frequency	(%)
Expressing emotion	“So today I went to my regular diabetes check-up. Came home with some really great news; my A1C was 7.5. The last three years have been really awesome for my BG as well; Last year was 8.2, and the year before was 6.3. The thing that makes this year special is the fact that, well, I’ve been managing it all pretty much by myself. My mom used to be the one to remind me to check my blood sugar and bolus right for meals, but now I do it on my own. It seems to be working great. Needless to say, I’m a very happy 14-year-old girl today. :P”	53	(14.0)
Advertisement	“The 1st chapter of my book is available for Free. Just click here!”	119	(31.5)

^a Could be categorized into multiple categories

Table 2 Associations of selected characteristics with level of activity for diabetes-related Google+ communities

Characteristic		Less Active ^a (<i>n</i> = 81)	Active ^b (<i>n</i> = 64)	Unadjusted OR		Adjusted OR	
				OR (95% CI)	<i>P</i> value	OR (95% CI)	<i>P</i> value
Geographic distribution							
Global		78 (53.8)	59 (40.7)	0.45(0.10–1.98)	0.292	–	–
Regional		3 (2.1)	5 (3.4)	–			
Principal objective							
Awareness creation	Yes	9 (6.2)	8 (5.5)	1.14	0.796	–	–
	No (Ref.)	72 (49.7)	56 (38.6)	(0.41–3.15)			
Providing support and sharing experiences	Yes	27 (18.6)	24 (16.6)	1.20	0.602	–	–
	No (Ref.)	54 (37.2)	40 (27.6)	(0.61–2.38)			
Product and service promotion	Yes	14 (9.7)	8 (5.5)	0.68	0.427	–	–
	No (Ref.)	67 (46.2)	56 (38.6)	(0.27–1.75)			
Diet-related topics	Yes	13 (9.0)	17 (11.7)	1.89	0.124	3.682	0.032
	No (Ref.)	68 (46.9)	47 (32.4)	(0.84–4.26)		(1.12–12.14)	
Exercise-related topics	Yes	14 (9.7)	10 (6.9)	0.89	0.790	–	–
	No (Ref.)	67 (46.2)	54 (37.2)	(0.37–2.15)			
Others	Yes	20 (13.8)	11 (7.6)	0.63	0.276	–	–
	No (Ref.)	61 (42.1)	53 (36.6)	(0.28–1.44)			

CI confidence interval

^a Latest activity on or after January 1, 2015

^b Latest activity before January 1, 2015

the Google+ communities and posts. Only 5.5% of the communities were restricted to particular geographic locations; the rest were global. Most (80.0%) of the communities were focused on “general diabetics,” 11.8% were focused on “type 1 diabetes,” 6.2% were focused on “type 2 diabetes,” and 2.1% were focused on “gestational diabetes.” The principal objective of the majority of the communities (35.2%) was to “provide support and share experiences.”

Regarding user-generated posts, 29.6% of the posts had at least one like (“+”), 17.7% posts had comments, and 89.2% posts had external links. The majority of the posts (69.6%) were focused on “general diabetes,” 16.9% were focused on “type 1 diabetes,” 12.4% were focused on “type 2 diabetes,” and 1.15% were focused on “gestational diabetes.” The top two themes of the posts were “providing information” (72.8%) and “advertisement” (31.5%) (Table 1).

Among the communities, 44.1% were “active” and 55.9% were “less active” (Table 1). Table 2 illustrates the association between Google+ community characteristics and level of activity. Communities dealing with diet-related topics were three times more likely to be active (OR 3.68; 95% CI 1.12–12.14). Finally, the Hosmer–Lemeshow test indicated that the logistic regression model fitted the data well ($P = 0.36$).

Discussion

In recent years, many people from all over the world have used SNS as sources of information on various diseases and how to manage them. SNS can influence patients’ health-care behavior by providing informational and emotional support [3], hence improving their ability to cope with health-related challenges [4]. Especially for patients with chronic diseases such as diabetes, it is very important to maintain a healthy lifestyle in order to minimize adverse outcomes. Since Google+ is one of the most popular SNS at present, it has the potential to become an effective platform for sharing information and spreading support as a peer-driven initiative.

We found that the majority of the Google+ communities had the principal objective of providing support and sharing experiences, suggesting that members of diabetes-related Google+ communities were more focused on giving support to fellow members. This should be contrasted with another SNS study relating to hypertension [5], which revealed that the main objectives of those groups were to create awareness and to promote prevention. These differences between the diabetes and the hypertension SNS groups possibly reflect the nature of those two diseases. As lifestyle habits such as diet and exercise are more important in disease management for diabetes than for hypertension, patients with diabetes are more likely to expect to gain lifestyle information from these SNS support communities. Thus, it is natural that users of diabetes-related communities will provide medical and lifestyle information for fellow members. In terms of the themes of the posts, 72.8% of the posts provided information and 6.3% asked for information, indicating that the members of these

communities were more willing to provide medical and lifestyle information for their fellow members.

Our study is limited in a few respects. Firstly, we only collected data from “public” Google+ communities; i.e., communities that were accessible. We were unable to collect information from private communities because of their privacy settings. Thus we don’t know if the private communities were different from the public ones. Secondly, our study results only reflect a specific time period and English-only groups, impacting the generalizability of our findings.

In conclusion, our study explored the content of diabetes-related Google+ communities and found that most of these communities’ activities were related to providing information and support. As the communities’ activity levels were quite reasonable, with proper initiatives they could serve as a peer-driven support platform for patients with diabetes. However, the accuracy and effectiveness of the information in the communities must be scrutinized further from a clinical perspective. Future studies of the activities of official communities organized by public diabetes societies will also add to our understanding.

Compliance with ethical standards

Conflict of interest None.

Ethics approval Not required.

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