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**Ripples of Change, How Social Media Drives
Awareness and Direct Behavior in Egypt's
Water Crisis: A Quantitative Study**

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● **تأثير وسائل التواصل الاجتماعي على زيادة الوعي وتوجيه**

السلوك في أزمة المياه في مصر: دراسة كمية

● د/ دينا يونس، مدرس، جامعة أكتوبر للعلوم الحديثة والآداب

● د/ مريم عامر، مدرس، جامعة أكتوبر للعلوم الحديثة والآداب

Abstract

Egypt faces a critical water crisis necessitating meticulous management and preservation of existing water resources. In an era dominated by social media, understanding its potential for addressing crises and fostering behavioral change is imperative. This research scrutinizes the effectiveness of the «Save Egypt's Water» initiative, the first of its kind on these platforms, aimed at raising awareness and catalyzing behavioral shifts in Egyptian water usage patterns. With limited Arabic studies in this domain, the research examines the platform's impact on understanding, perception, retention, and subsequent engagement, crucial indicators of behavioral change. By exploring the intersection of social media, water conservation, and Egyptian society, this study provides valuable insights into leveraging digital platforms for sustainable resource management. This study employed quantitative research, where data collected was done through an online survey that was distributed among a sample of 184 individuals (N=184). The results provided by the study reflect different implications regarding the Facebook page, the followers of the page, and the people in general.

Keywords: Social Media, Egypt Water Crisis, Climate Change, Save Egypt's Water, Digital Platforms

ملخص الدراسة

تواجه مصر أزمة مائية حرجة، تتطلب الحفاظ الدقيق على الموارد المائية الحالية، وفي هذا العصر الذي تهيمن فيه وسائل التواصل الاجتماعي، من الضروري فهم إمكانياتها في معالجة هذه الأزمات، وتعزيز التغيير السلوكي، ويقاس هذا البحث فاعلية مبادرة «Save Egypt's Water»، وهي الأولى من نوعها على هذه المنصات، التي تهدف إلى زيادة الوعي وتحفيز التحولات السلوكية في أنماط استخدام المياه في مصر، ومع قلة الدراسات العربية في هذا المجال، يخصص البحث تأثير المنصة على الوعي والإدراك والاحتفاظ والانخراط التالي، وهي مؤشرات رئيسية للتغيير السلوكي، واستخدم البحث النهج الكمي، بجمع البيانات من خلال استطلاع عبر الإنترنت وزع على عينة من 184 فردًا (N=184)، وتوضح نتائج الدراسة تباين الآثار المختلفة المتعلقة بصفحة فيسبوك، ومتابعي الصفحة، والجمهور عامة، كما فحصت فيه تأثير صفحة فيسبوك «أنقذ مياه مصر» على وعي الأفراد وإدراكهم ومشاركتهم فيما يتعلق بقضية ندرة المياه في مصر، بهدف توعية الناس بخطورة المشكلة، وتأثير سلوكهم من خلال تقديم حلول لهذه القضية أيضًا. الكلمات المفتاحية: وسائل التواصل الاجتماعي، أزمة المياه في مصر، تغير المناخ، أنقذ مياه مصر، المنصات الرقمية.

Introduction

In Egypt, the proliferation of the economic, agricultural and industrial development, as well as the rapid urbanization, causing an increase in the population count, has led to an intensified demand and dependence on the country's water supply and resources resulting a major water crisis (Abdin & Gaafar, 2009). Egypt lies within a hyper-arid climatic zone, resulting in scarce water resources. With a demand of approximately 114 billion cubic meters (BCM) per year, the country faces a significant shortfall, as only around 60 BCM per year is accessible (Hassan, Nashaat, & Ebethal, 2024). Accordingly, a need for social marketing campaigns was developed to promote resourceful actions and behavior change regarding Egyptians' water consumption. Despite the growth of social media platforms and its usage in many social and public health awareness campaigns, its impact is still questionable when it comes to the Egyptian audience perception and their behavior change. There are lots of challenges that social media practitioners face while using online space to promote for the change of deep-rooted behaviors in media illiterate audience.

Social marketing has grown in popularity and usage within the social communities regarding public health issues as well as social issues in general (Grier & Briant, 2005), and focusing on the target audience, regardless their diverse preferences, to change their behaviors is considered the essence of social marketing application (Daniel et al, 2009). Meanwhile, social media is used extensively providing an opportunity for online social marketing campaigns. Social media thrived because of its interactive nature, where it allows its users to practice participation, collaboration, and empowerment (Mishaall & Shanab, 2015). Therefore, using social media to market for social issues is considered one of the most effective and efficient method of communication, especially in social issues like water crisis. In Egypt, there

were a number of online social campaigns that tried to address the water problem through online platforms, for instance, 'Every Drop Counts', 'Save it to Get it', 'Water for Life', and last, 'Save Egypt's Water'. Yet, Egyptians' behaviors did not show the intended results of the campaigns.

One of the key strategies to save water in Egypt is the modernization of irrigation systems. More than 80% of the country's water resources is consumed by agriculture and traditional flood irrigation methods are highly inefficient leading to a great portion of water loss. What can greatly reduce water waste is transitioning to more efficient systems such as drip and sprinkler irrigation. According to Abdelhady, Mohamed, and El-Khouly (2021), claimed that the improvement of water use efficiency by up to 50% can be done through the adoption of advanced irrigation techniques, conserving millions of cubic meters of water annually.

Another technique to preserve water is to implement water-saving technologies and practices in urban areas. There are few potentials to conserve significant amount of water by doing water recycling and reuse, using greywater systems in households and public buildings for non-potable purposes, such as irrigation and toilet flushing. According to Abdel-Mohsen, El-Ghandour, and Abdel-Raheem (2020) they highlighted the importance of public awareness campaigns in promoting water conservation behaviors among citizens, noting that behavioral changes could reduce household water consumption by 10-20%.

El-Gamal and El-Raey (2019) emphasize the need for investment in renewable energy sources to power desalination plants, thereby reducing the environmental impact and making the process more sustainable in the long term. More over in 2023 Ahmed, N and El-Sayed, E explored the role of innovative water-saving technologies in promoting sustainable agriculture in Egypt. they highlight the benefits of precision irrigation, soil moisture sensors, and other technologies in improving water use efficiency. **Mohamed, N. E., & El-Gharabawy, M. R. (2021)** provides an overview of Egypt's water management strategies post-2020, focusing on the challenges

posed by population growth, climate change, and regional geopolitics. It also discusses opportunities for enhancing water conservation and efficiency

Problem Statement

Egypt is facing a water crisis, therefore proper understanding, management, protection, and maintenance of the current water resources are vital to preserve the present water supply. Since, social media became the most-used medium nowadays, due to its instant feedback and freedom of expression, addressing water issues and behavioral change through it needs to be examined and weighed properly. Some studies claim that social media contributes positively to behavioral change especially in public health issues (Hober et al, 2013), and Egyptians reliance on social media, Facebook in specific, initiated the need to study such platform in a thorough manner. Additionally, the lack of the Arabic studies in such area, made it a very intriguing area of interest for the researchers to dig deeper.

One of the online water initiatives is “Save Egypt’s Water”, as it is considered the first Facebook/Instagram page that aims at creating awareness and spreading behavioral change among Egyptians regarding their water consumption behaviors. This study aims at identifying the role of “Save Egypt’s Water” in creating awareness among the Egyptians, and examining the association between awareness, perception, retention, and finally engagement as a sign of behavioral change.

I. Literature Review

Social Media Platform:

Social media platforms are considered one of the most exciting and interesting topics nowadays, that grabs the attention of experts and scholars on many different levels. Social media changed the perception of the audience regarding mass media usage, where it shifted the media from self-content generation to group-content generation, as a result of its participatory and collaborative nature (Mishaall & Shanab, 2015). In other words, it enables its users to participate by sharing their content with each

other, as well as collaborating by creating their own online communities. Moreover, it provides its users with time character, where it enables to users to publish their own content to be seen by their online communities at the same time of publishing, therefore enabling others to instantly contribute by sharing their opinions and comments (Margo, 2012). Likewise, it shifted how organizations and governments address social issues to the public, where social media created its own niche audience through online space (Ramsaran-Fowder & Fowder, 2013).

As the number of internet users increase, the practices of online trends increases as well, where addressing social issues through social media such as Facebook, Instagram, Twitter, What's app, and Linked-In became the most used communication platforms because of its impact on the users' behaviors (Krypton, 2018). Facebook in specific has thrived in connecting users by shared likes and dislikes, where it is considered one of the top social networking sites and third most visited site after google and YouTube. Since its introduction in 2004, Facebook has redefined the online platform, where it changed the perception of the users towards communication, relationships, virtual identities, and entertainment (Corrigan etal, 2018). However, it did not succeed much in having a cultural impact due to the biased and mixed opinions found on it on the one hand. On the other hand, the diversity of the sources of information form which opinions are formed, consequently Facebook users face a number of challenges while being online (Ennaji etal, 2018).

The emergence of Facebook and its personalized profiles have given the marketers the opportunity to directly communicate with their audiences' through a tailored message. Facebook replaced diverse media, where they were considered one-way communication platform, and it became an exceptional direct-response communication platform. In other words, it can provide prompt and direct responses to any problem or question or concern within the slightest time period. Such interaction characteristic, Facebook provides valuable insights about its users that could be very beneficial for social and product marketing as the consumers are the ones who position

the brand and the message and not the organization (Ramsaran-Fowder & Fowder, 2013).

Researchers implied that social media networks allowed for information circulation between the diverse networks of its users, where it allowed for interactions between its users that generates positive impact, for instance, creating communities between people who share interests, users' engagement through blogs, and combining different social marketing tools to appeal to the potential audience (Magnold & Faulds, 2009).

a. Social network as a powerful tool for behavioral change
Social media has grown into the lives of many young adults and adolescents, where it started to contribute in their identity shaping. The more online technologies are introduced, the more social media crawl its way in the experience, social and personal selves of its users. Some researchers found that adolescents' heavy social media usage impacts the way they perceive themselves on the one hand. On the other hand, it affects their perception towards their family, their peers, their group norms and their behaviors. Additionally, these technological advanced online tools affect the identity formation as they offer a view of how we see ourselves and how other people see us as well (Ramezankhani et al, 2019). The theories of behavioral change specified in social norms provide a platform for understanding the impact of social media on identity development, where most of the theories suggested that social observation and interaction are the premises for guiding people's behaviors and beliefs through "electronic acculturation". Therefore, young social media users learn and transmit health and risk behavioral norms during this formational period (Villanti et al, 2017).

Additionally, when discussing major social issues on social media platforms, an increased attention is given to it (Shabir et al, 2014). A study conducted by velenzuela, park, and kee (2008) resulted two major findings regarding social media usage, first online social platforms are effective tool for connecting people on the one hand. On the other hand, it allows them to create the content and participate in social and public issues in an

expressive manner, thus increasing the users' online media literacy skills. Second, social media platforms can be used as a tool for collective action (as cited by Al Sharqi, 2015). Therefore, the role of social media in behavioral change is sharp and recognized, where it varies from an age range to another, nevertheless it affects all types of audience. Save Egypt's Water is a social media movement that aims at raising awareness regarding water scarcity and changing Egyptian behavior regarding water usage. It is one vital example of the impact of internet, especially social media, on developing peoples' behaviors and perceptions.

Save Egypt's Water:

Save Egypt's Water is an online movement that started in 2018 with an aim of raising awareness about the irrational habits that result the consume of redundant water. The main goal of the online movement is to establish awareness among young adults regarding water scarcity in Egypt through social media, however it started to take more ground activities. "Save Egypt's Water" is an initiative on the verge of formal establishment as a nonprofit organization. Its primary objective is to spotlight water scarcity issues in the nation. The core message emphasizes that every Egyptian can play a part in addressing this challenge through small adjustments in daily habits.

Save Egypt's Water has two social media accounts, Facebook and Instagram, where both were chosen as they are the most convenient platform for reaching the required target audience, whom are young adults and adolescents. The social class of the target audience is A and B, where they are able to understand the messages posted on both social media platforms as they are written in English. The Facebook page has about 30,181 thousand followers, while the Instagram page has 6215. As mentioned above, the campaign started to take ground activities, like visiting schools and universities to educate the students about water scarcity, and younger generations are targeted because they are more prone to change and

attaining new perceptive habits and behaviors regarding water saving (save egypt's water, 2019).

Hierarchy of Effects Model

Hofacker initially came up with the model of information processing in his book 'internet marketing' in the year 2000. He proposed this model in order to help media practitioner understand how their online message communicate value to the online visitor. The five stages of information processing model are; (1) Exposure, (2) Attention, (3) Comprehension and Perception, (4) Yielding and Acceptance and (5) Retention. First Exposure, which is mean by the idea that the online visitor becomes exposed to the online content for long enough that will make him/her able to engage with it. Second, Attention, refers to the physical factors in the online content that attract the online visitor and makes him/her pay attention. Third Comprehension and Perception, means the extent to which online visitors understand the content and how they look at it from their point of view. Forth, Yielding and Acceptance, mean the degree in which the online visitor believes and/or trust the content that is given to him and if acceptance occur this means that the online visitor will stay on your site and proceed to the next and final step. Fifth, Retention, refers to how will your online visitors remember your messages and whether they will recall the message or not thus leading to behavioral change and an action to be taken by the online visitor (Chaffey & Hanolon, 2018).

This study is related to previous research done on water conservation in the Middle East (Iskandarani, 2002; Keshavarzi et al., 2006; Morowatisharifabad, Momayyezi, & Ghaneian, 2012). The study examines the impact and effect of Save Egypt's Water social media campaign on Facebook and Instagram in promoting water conservation actions in Egypt. The study's aim to assess the campaign's impact on two levels cognitive and conative. The objective is to understand two factors: people's awareness of the severity of water

scarcity in Egypt and people's action toward the solution for the water scarcity problem in Egypt.

The researcher used Hofacker's information processing model in developing the research hypothesis. Where they based the first two hypotheses on the cognitive stage of an individual (Exposure, Attention, Comprehension and Perception).

H1: People who get exposed to Save Egypt's Water Facebook page are more aware of the water scarcity problem than those who are not exposed.

H2: People who get exposed to Save Egypt's Water Facebook Page will perceive that water scarcity in Egypt more critical than those who are not exposed.

While the other two hypotheses are based on the conative stage of an individual (Retention).

H3: People who get exposed to Save Egypt's Water Facebook page are more likely to retain the message of Save Egypt's Water movement than those who are not exposed.

H4: People who get exposed to Save Egypt's Water Facebook page are more likely to engage in water preservation behavior and take action than those who are not exposed

Methodology

Data Collection:

Data collected for this study was done through an online survey that is distributed among a sample of 184 individuals (N=184). This study conducted a comprehensive survey of people's awareness and behavior towards the water scarcity problem and water conservation solutions in Egypt. Sample included active Egyptian participants on social media websites; Facebook and Instagram. For the purpose of this study the researchers conducted a non-probability sample on the Egyptian public. The

online survey was divided into two parts. where first, participants were asked about their level of awareness toward the problem and second, participants were asked about their behavior and actions taken towards the water scarcity problem in Egypt.

Measures:

The impact of the Save Egypt's Water social media movement was assessed by various questions such as: Do you know about Save Egypt's Water online movement? Do you know about the water scarcity problem in Egypt? How long have you been aware of the water scarcity problem in Egypt?. To measure the awareness of the water scarcity situation in Egypt, the researchers asked questions that reflects people's general perception of the severity of the Egyptian water problem. participants were asked to answer several statements on a 3 point Likert scale ranging from 1=Agree, 2=Neutral, and 3=Disagree. Statements such as: I believe that Egypt is facing a water problem, I am aware that by the year 2025 Egypt will suffer from absolute water scarcity, I am aware that water taps in Egypt are starting to run dry and so on. Furthermore, Individuals were asked questions to see whether participants could retain and recall Save Egypt's Water message and the solutions that they provide, such as Are you able to recall the message of Save Egypt's water movement? Are you able to remember the solutions that SAVE EGYPTS WATER provide? Water conservation and solution behavior was measured as the sum score of 8 separate water conservation actions within the household as shown in Table 1. To measure the behavior and actions taken towards the water scarcity problem in Egypt participants were asked a serious of statements where they need to answer with 1= Yes and 2=No. such as: Conducting regular maintenance on water pipes, tanks, fixtures and/or toilet tanks, fixing any leakage or broken pipes immediately, taking shorter showers, closing the faucet while brushing teeth or washing dishes, and so on. Lastly, the data-set includes three variables to control for socio-demographic differences. Gender, entering as a binary variable with 1 = Male and 2 = Female. Age is measured as an ordinal variable, with responses ranging from 16- 19, 20- 24, 25- 29, 30- 34, 35- 40,

and 41- above. Education is represented through six consecutive levels of schooling, ranging from 1= High school / Thanaweya Amma ,2= Undergraduate, 3= Bachelor Degree ,4= Master's Degree , 5= PhD and 6= other.

Description of the sample

The questionnaire was distributed among the sample that included 184 participants and out of those the respondents were 184 (N=184). The survey was divided among both females and males, with a total of 127 females (69%) and 57 males (31%). the participants were from an age range of 16-19 with 17.4%, 22.3% were from 20-24, 19.6% were from 25,29, the majority were from the age range 30-35 with 28.3%, 6.5 % were from 36-40 and 6.0% were from 41 or above. Concerning the respondents' education the vast majority held a bachelor degree with 48.4%, 25.6% held a postgraduate degree, 21.7% were still undergraduates, while only a mere 4.3% held a Diploma or Thanaweya Amma certificate.

Descriptive Analysis

Frequencies

Respondents were first asked about their level of exposure to Save Egypt's Water social media page on Facebook and Instagram. Participants had to first answer whether they know the movement or not, are they aware of the water scarcity problem in Egypt and for how long have they known about the water scarcity problem in Egypt. Out of the total respondents only 45.1 % said that they are aware of Save Egypt's Water movement on social media, while the majority were un-aware with a total of 54.9%. however, the majority of the respondents 90.8% said that they are aware about the water scarcity problem in Egypt, while only a mere 9.2% said that they do not know that there is a water scarcity problem in Egypt. When asked how long have you been aware about water scarcity problem in Egypt, the majority were aware of the problem for 7 months and more with 73.9%, while 15.2% claimed they are aware for 1-6 months, 3.3% are aware of the

problem for 2-4 weeks and 7.6% were aware from 1 week or less. When the researcher asked about DAY ZERO only 44.0% were knew about it and 41.8% of those who knew about, understood what is meant by it.

To examine the perception of water scarcity problem in Egypt and how critical do the respondents see the water scarcity problem respondents were asked to answer a three point Likert scale on the following statements. "I Believe that Egypt is facing a water problem" the majority of the respondents 87.5% agreed with the statement (N= 184, M= 1.12, SD= 0.33). "I am aware that Egypt is a country that is water scarce" 66.8% were aware of the water scarcity problem and agreed with the statement while only 7.6% disagreed and the rest were neutral (N= 184, M= 1.40, SD= 0.62). "I am aware the by the year 2025 Egypt will suffer from absolute water scarcity" here half of the respondents agreed to this statement with 50.2% and 15.2% disagreed, while the other 34.2% remained neutral (N= 184, M= 1.64, SD= 0.73). "I am aware that water taps in Egypt are starting to run dry" 38.6% agreed with the statement, 41.8% were neutral and 19.6% disagreed (N= 184, M= 1.80, SD= 0.74). "I am aware that water scarcity in Egypt will produce more diseases" the majority of the respondents agreed with this statement with 88.0%, while only a mere 1.6% disagreed and the rest 10.3% remained neutral (N= 184, M= 1.13, SD= 0.38). "I am aware that water scarcity in Egypt will lead to a dry soil" 91.8% agreed with the statement, only 1.1% disagreed and 7.1% answered that they are neutral(N= 184, M= 1.09, SD= 0.32). "I am aware that water scarcity in Egypt will lead to more poverty" only 0.5% answered that they disagree with the statement, 7.1% were neutral and majority with 92.4% agreed (N= 184, M= 1.08, SD= 0.29). Descriptive statistics are given in Table 1.

| | N | Minimum | Maximum | Mean | Std. Deviation |
|--|-----|---------|---------|--------|----------------|
| I Believe that Egypt is facing a water problem | 184 | 1.00 | 2.00 | 1.1250 | .33162 |
| I am aware that Egypt is a country that is water scarce | 184 | 1.00 | 3.00 | 1.4076 | .62912 |
| I am aware the by the year 2025 Egypt will suffer from absolute water scarcity | 184 | 1.00 | 3.00 | 1.6467 | .73193 |
| I am aware that water taps in Egypt are starting to run dry | 184 | 1.00 | 3.00 | 1.8098 | .74049 |
| I am aware that water scarcity in Egypt will produce more diseases | 184 | 1.00 | 3.00 | 1.1359 | .38838 |
| I am aware that water scarcity in Egypt will lead to a dry soil | 184 | 1.00 | 3.00 | 1.0924 | .32584 |
| I am aware that water scarcity in Egypt will lead to more poverty | 184 | 1.00 | 3.00 | 1.0815 | .29362 |
| Valid N (listwise) | 184 | | | | |

Table 1: Perception of water scarcity problem in Egypt's descriptive statistics

To examine whether respondents were able to remember the message of Save Egypt's Water movement on social media, participants were asked three questions. First, are you able to recall the message of Save Egypt's water movement? 49.5% answered that they are able to remember, while the majority 50.5% did not remember their message. Second, are you able to remember the risks of water scarcity that are provided by SAVE EGYPT'S WATER? 48.9% answered that they remember the risks presented in the page and, 51.1% did not remember. Third, are you able to remember the solutions that SAVE EGYPTS WATER provide? The majority did not remember the solutions with 54.3% and 45.7% said that they do remember the solutions provided by the movement. Respondents were asked Have you ever thought of taking any actions towards solving the water scarcity problem in Egypt? The majority said that they took an action with 66.3%.

Water conservation behavior was measured as the sum score of 8 distinct water conservation actions that respondents participated in (as shown in

Table 2). Respondents were asked to answer yes or no on the following statements. Do you conduct regular maintenance on water pipes, tanks, fixtures and/or toilet tanks? The majority participated in this behavior with 61.4% answering yes (N= 184, M= 1.38, SD= 0.48). Do you use water-saving devices? Respondents did not use water saving device with more than half saying no 60.9% (N= 184, M= 1.60, SD= 0.48). do you fix any leakage or broken pipes immediately? More than half of the respondents said yes they fix any broken pipes with 77.2% and only 22.8% saying that they do not fix their broken pipes (N= 184, M= 1.22, SD= 0.42). Do you close the faucet while brushing teeth or washing dishes? 84.8% of the respondents said yes they do close the faucet, while a mere 15.2% answered with no (N= 184, M= 1.15, SD= 0.36). Do you wash vegetables in buckets instead of running water? 51.1% of the respondents answered Yes, while 48.9% said No (N= 184, M= 1.48, SD= 0.50). do you take shorter showers? The majority of participants said that yes they do take shorter showers with 64.7% (N= 184, M= 1.35, SD= 0.47). do you run full loads in washing machines / washing once a week? 58.7% answered yes, while 41.3% of the respondents answered with no (N= 184, M= 1.41, SD= 0.49). and finally do you collect and use rainwater? Only 16.3% said yes, with the majority saying no 83.2% (N= 184, M= 1.83, SD= 0.37).

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|-----|---------|---------|--------|----------------|
| Conducting regular maintenance on water pipes, tanks, fixtures and/or toilet tanks. | 184 | 1.00 | 2.00 | 1.3859 | .48813 |
| Using water-saving devices | 184 | 1.00 | 2.00 | 1.6087 | .48937 |
| Fixing any leakage or broken pipes immediately. | 184 | 1.00 | 2.00 | 1.2283 | .42086 |
| Closing the faucet while brushing teeth or washing dishes | 184 | 1.00 | 2.00 | 1.1522 | .36017 |
| Washing vegetables in buckets instead of running water. | 184 | 1.00 | 2.00 | 1.4891 | .50125 |
| Taking shorter showers | 184 | 1.00 | 2.00 | 1.3533 | .47929 |
| Running full loads in washing machines / washing once a week. | 184 | 1.00 | 2.00 | 1.4130 | .49372 |
| Collecting and using rainwater. | 184 | 1.00 | 2.00 | 1.8315 | .37531 |
| Valid N (listwise) | 184 | | | | |

Table 2: Water conservation behavior and action's descriptive statistics

Discussion:

The researchers saw an opportunity to fill an important void in the research area of media's coverage of the water scarcity problem in Egypt. To date, campaigns covering the water issue in Egypt has been under researched and unacknowledged. This study examined the role of social media as an awareness and behavioral tool, specifically focusing on Save's Egypt Water social media movement. The aim of the study was to examine the impact and influence of the Facebook and Instagram page on its followers' awareness, perception and behavior.

H1: People who get exposed to Save Egypt's Water Facebook page are more aware of the water scarcity problem than those who are not exposed. This

hypothesis measures the degree of people's awareness of water scarcity in Egypt after being exposed to Save Egypt's Water Facebook page. A t-test was conducted for H1 and results show that there is no statistical significance between being exposed to save Egypt's water Facebook page and becoming more aware of the problem of water scarcity, therefore H1 was not supported which means that there is no relation between the exposure to save Egypt's water page and knowing more about the water scarcity problem ($p=0.061$, $N=184$).

H2: People who get exposed to Save Egypt's Water Facebook Page will perceive that water scarcity in Egypt more critical than those who are not exposed. This hypothesis measures the people's perception towards the issue of water scarcity in Egypt and how it is affected by the exposure to save Egypt's water page. A one-way ANOVA test was conducted and the results showed statistical significance between the above mentioned variables, therefore H2 was supported which means that there is a relation between being exposed to save Egypt's water page and perceiving the water problem in Egypt to be more critical than those who are were not exposed ($p=0.001$, $N=184$). While the other two hypotheses are based on the conative stage of an individual (Retention).

H3: People who get exposed to Save Egypt's Water Facebook page are more likely to retain the message of Save Egypt's Water movement than those who are not exposed. This hypothesis measures the ability of the people to remember the messages they get exposed to on save Egypt's water Facebook page regarding water preservation and scarcity. A one-way ANOVA test was conducted and the findings show that there is no statistical significance between getting exposed to save Egypt's water Facebook page and being able to retain the messages this social movement calls for,

therefore H3 was not supported which means that people do not necessarily remember the messages of save Egypt's water page ($p=0.377$, $N=184$).

H4: People who get exposed to Save Egypt's Water Facebook page are more likely to engage in water preservation behavior and take action than those who are not exposed. This hypothesis measures the relation between people's engagement in active restorative behaviors for water preservation and being exposed to save Egypt's water Facebook page. A one-way ANOVA test was conducted and the findings showed statistical insignificance between being exposed to save Egypt's water page and taking actions towards water preservation. Therefore, H4 was not supported which means that there is no relation between being exposed to save Egypt's water Facebook movement and being engaged in water preservation behaviors and actions. There is no difference between the people who were exposed and those who were not ($p=0.577$, $N=184$).

Conclusion

This study examined the effect of Save Egypt's water Facebook page on people's awareness, perception and engagement regarding water scarcity issue in Egypt. The page aims to aware people of the severity of water problem in Egypt, and influence their behavior by providing solutions for such issue as well. Using survey as a quantitative method and online questionnaire as a method for data collection, the results show that the page has a partial influence on water conservation awareness, perception and behavior. The Facebook page increased people's perception towards water conservation issue, where they started to perceive water scarcity as critical as well as severe issue as a result of being exposed to save Egypt's water page in particular. However, neither awareness of the severity of water situation nor behavior required to avoid the scarcity and maintain

conservation was affected by the exposure to the Facebook page, as all the results of testing awareness, retention, and engagement are statistically insignificant.

The results provided by the study reflects different implications regarding the Facebook page, the followers of the page, and the people in general. This paper is the first attempt to provide scientific evidence for the effectiveness of save Egypt's water social movement. Social media campaigns usually have positive impact on behavioral change (Villanti et al, 2017), however this study implied otherwise. This conclusion stands in contrast to the above studies, where people's behaviors and knowledge are not affected by social media campaigns and movements. The findings of save Egypt's water movement have impact on people's perception regarding the criticality of water conservation issue, as being exposed to the Facebook page increases people's critical view regarding the threat of water scarcity. Nonetheless, their knowledge and engagement in actions to solve such problem is not affected by this social movement on the one hand. On the other hand, people can neither remember the messages or the actions that are posted on save Egypt's water Facebook page after they get exposed to it (retention). The study findings show that people who choose to take preservative actions or acquired awareness and knowledge regarding water conservation, was a result of personal effort and not a result of exposure to the social movement.

This study faced limitations in the response rates of the participants, where participants were contacted to fill out online questionnaires but a lot were unresponsive. The study was limited because many people who liked Save Egypt's Water on Facebook and Instagram were no longer active social media participants. This study faced other obstacles such lack of social media campaigns on water scarcity problem in Egypt and lack of campaigns

on water conservation solutions in Egypt. Lastly, as the researcher used a non-probability sampling technique, the study lacked external validity therefore its results cannot be generalized on the Egyptian public. Recommendations for future research include a replication of this study and specifically a more advanced investigation and research in the role of social media campaigns in determining behavioral change. Moreover, additional empirical evidence is needed to evaluate the various effects of social media water conservation campaigns. There is also a need for longitudinal studies of water conservation behaviors to better understand the impacts of such social media campaigns in audiences' awareness, perception and behavior. Finally, the researchers would advise future studies to conduct well-designed longitudinal studies, which will allow others to distinguish causality from correlation. The final limitation of this study was the sample size of 182 may reflect the maximum feasible number of participants given in this study. This is a common and acceptable justification, especially in exploratory studies. This is why the researchers recommend taking this study as a first step to get more in-depth information and be able to generalize the information.

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