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# Psychological effects before, during and after Hurricane Maria

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## ABSTRACT

Since vulnerability is not recognized, the issue of mental health in Puerto Rico is something that is invisible on the island. The objective of this research is to recognize the negative psychological effects caused by the passage of Hurricane Maria in Puerto Rico. The data collection was carried out through nine semi-structured interviews, with Puerto Ricans between the ages of twenty to seventy-five years of age, the majority being college students. The experiences of each of the interviewees regarding their life before, during and after Hurricane Maria were investigated. The results of this research showed that the greatest impact, in terms of mental health, was during the months after the hurricane. As mentioned by most of the participants, the despair of seeing that nothing returned to normal and that necessities—drinking water, electricity, food, etc.—were scarce, created a mass hysteria and great trauma. Puerto Ricans have not yet overcome the adversities that Hurricane Maria brought. During the investigation, we were able to observe how there are still people who have not recovered mentally or psychologically after this natural disaster. According to our observations, there are many people in need of professional psychological help, which is not recognized, as seeking such help is taboo. Therefore, it is time to act and start working on this situation.

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Puerto Rico; Hurricane Maria; psychological effects

The initial problem that this research seeks to analyze is the negative psychological effects that the passage of Hurricane Maria had on Puerto Ricans. Maria was a hurricane that passed the island of Puerto Rico on 20 September of 2017 and left the island devastated for months, even years. According to the literature, after Hurricane Maria, suicide cases in Puerto Rico increased (Howard, 2018). This shows some of the negative psychological effects, such as anxiety, depression, and hopelessness, among others, that affected people. It is important to talk about this topic since the issue of mental health is one that is often avoided on the island. Also, it is very important to let people know that it is not wrong to speak up and express what they feel. This research humanizes those feelings by offering insight into the factors that contributed to people's sense of helplessness.

In Puerto Rico, as a social crisis arose from the mismanagement of supplies available after Hurricane Maria, there was a large-scale migration to the United States. There was also a lack of communication between those on the island and beyond because the hurricane destroyed all signal towers. Therefore, there was no cellphone reception on the island. As a result, Puerto

Rican families experienced negative psychological effects such as: separation, anxiety, sadness, loneliness, the feeling of abandonment, among others, generating, in fact, major mental illnesses, such as, depression. These problems must be addressed with equal or greater urgency with which material losses are addressed.

This research aims to problematize the negative psychological effects described, which are often ignored because of the social stigma towards mental health problems of individuals and communities. By not talking about the psychological well-being of people, it is impossible to address the impact of such events and avoid tragedies such as suicides. According to statistical data from the Puerto Rico Department of Health and the Commission for the Prevention of Suicide, the number of suicides in 2017 increased alarmingly the year when Maria passed through Puerto Rico (20 September 2017). In 2016, the death toll from suicide was 207 (182 men and 25 women, both between the ages of 45 and 49). In 2017, the number increased to 259 (222 men and 37 women, both between the ages of 55 and 59). By comparison, in 2018 the number dropped to 243 (211 men and 32 women, both between the ages of 40 and 44) (Commission for the Prevention of Suicide (CPS), 2018) (Wyss 2018).

Many Puerto Ricans left the island following Hurricane Maria. But Puerto Rico's fiscal and economic crisis preceded the hurricane and contributed significantly to high levels of migration, which contributed to fewer networks of support on the island. In 2016 the population of Puerto Rico was 3,406,495 inhabitants; in 2017, 3,325,001 inhabitants; and in 2018, 3,195,153 inhabitants (CPS, 2018). The economic, social and political crisis that led to high levels of migration both before and after Maria, resulted in people being separated from families and other support systems which had a great impact on the mental health of both those who stayed and those who left.

One indication of the mental health toll of these experiences is the rising number of calls to suicide hotlines. In 2016, the total number of answered calls on the suicide hotlines at the Suicide Prevention Resource Center was 91,333. The number of people treated for suicidal ideation was 23,275 and for suicide attempts, 4958. In 2017, the total number of answered calls was 113,830; the number of people treated for suicidal ideation was 24,607 and for suicide attempts, 7456. For 2018, the total number of answered calls was 161,585; the number of people treated for suicidal ideation was 16,499 and for suicide attempts, 6581 (CPS, 2018).

As these data demonstrate, it is extremely important to talk about these problems and create spaces where open conversations can be held and feelings are not ridiculed, overlooked, or stigmatized. One way to do this is to have humanizing conversations and prioritize all health issues, especially mental health. These health problems that affect a person's mental state, be it depression or some other related mental health issue, should not be excluded. This research explores the taboo subject of mental health in Puerto Rico by investigating how Puerto Ricans were psychologically affected before, during, and after Hurricane Maria. While Hurricane Maria certainly contributed changes—such as the loss of support networks due to migration—the negatively impacted people, the political, economic and fiscal crisis reflect what anthropologist Yarimar Bonilla (Bonilla 2020) refers to as “the coloniality of disaster,” which has also had lasting impact on Puerto Ricans' well-being.

## Literature review

The living conditions that Puerto Ricans faced after Hurricane Maria included the loss of family members, being without electricity, water and communication for long periods of time and the loss of a home. Also, family separation due to migration to the United States in search of better conditions and opportunities, among others, were the reasons for generating very serious mental health problems. Some of these mental health problems are evidenced in the negative psychological effects mentioned in the article “Puerto Rico's Suicide Rate Continues to Rise” (Howard,

2018). These include: post-traumatic stress disorder (PTSD), loneliness, the sense of loss and isolation, among others. Of these negative effects, post-traumatic stress is the most common among Puerto Ricans since the hurricane. It is a mental illness that occurs after experiencing terrifying events, like war, emotional abuse, and some natural disasters, such as Hurricane Maria. Symptoms of post-traumatic stress disorder may appear immediately, or even weeks, months or years later.

As Howard (2018) relates, citing the Commission for the Prevention of Suicide, “in 2017, 253 Puerto Ricans committed suicide”, of which, “after Maria, 20 occurred only in December.” The number in 2016, was only 207. In 2017 (the year that hurricane Maria passed), between September and November, the number of cases of death by suicide was 27. Consequently, these numbers demonstrate that a delay in treating these disorders, either due to access issues or lack of economic resources, can lead to devastating effects, such as suicide.

The post-hurricane Maria crisis was exacerbated by the already myriad sociopolitical issues (resulting from US colonization) that plagued the island, which exploded in her wake. In “Puerto Rico: The Forgotten Island” Wyss (2018) states that: “A decade-long recession, high unemployment, crime and a general feeling of helplessness had gripped La Isla del Encanto. Then came Maria.” (Wyss, 2018). Yarimar Bonilla and Marisol LeBron make similar observations, noting “Long before the hurricane, Puerto Rico felt to many like a society in ruin—financially and politically” (Bonilla and LeBron 2019, p. 5). Many scholars have documented high levels of depression or anxiety before Maria due to the country’s economic crisis and its impact on society. “We’re living through a deep financial crisis that has been with us a long time, and then we had to live through two back-to-back hurricanes.” (Wyss, 2018).

An example of this is the case of Marilisa Velez Garcia, a 44-year-old “*Viequense*”, taxi driver, who already suffered from postpartum depression and who was also struggling to make ends meet financially. The trauma of Hurricane Maria added to the strain she experienced prior to the hurricane. For example, for weeks after the hurricane, Marilisa’s elderly mother went without potable water, electricity, or even basic communications. She succumbed to her suffering and passed away from undiagnosed pneumonia. The death of her mother, compounded by the destruction and delayed response for emergency services, were traumatic experiences for Marilisa. As a result, Marilisa experienced extreme depressive symptoms.

According to Wyss (2018), “A year later, much of the physical damage has been repaired—but experts say the emotional and psychological damage could take longer to heal.” It is evident that most of the physical damage caused by the passage of Hurricane Maria was repaired within 1 or 2 years. However, the psychological damage that it caused, plus the accumulation of negative effects prior to the hurricane, are not always visible. Mental health is an aspect of health that is relegated as less important as physical health. Wyss (2018) states, “People are focused on their immediate needs, people are more worried about eating than going to the psychologist”. That is, when one is unable to seek psychological help due to the high costs of these services, due to lack of transportation or simply due to the social stigma of seeking professional help, mental help tends to be cast aside as less important in the immediate.

In addition to identifying the negative psychological effects of Hurricane Maria, this research seeks to identify the causes of the negative psychological effects far beyond the impact that this catastrophic hurricane produced. From this research, we can deduce the reality of thousands of Puerto Ricans. In other words, the accumulation of social problems, including poverty, little health care, poor administration of basic needs services (drinking water and electricity), inaccessibility to daily life and the despair that they lived day by day are what Bonilla and LeBron refer to as the “aftershocks of disaster,” which are both about the natural disaster of the hurricane and the political-economic disaster produced by “the enduring legacies of colonialism” (Bonilla and LeBron, 2019, p. 11).

## Methodology

Our research consists of nine interviews with Puerto Ricans who went through the experience of Hurricane Maria. The participants come from different towns and sectors of the island, but what they have in common is that each of them lived the experience of the devastating hurricane. We chose these participants because it was essential that we heard from Puerto Ricans who had experienced the event, as they could provide relevant answers to our investigation. The age range of the study participants was twenty to seventy-five (20–75) and each participant was in Puerto Rico before, during and after Hurricane Maria. Another method used were field notes researchers took during the interviews that provided important information. Some of these observations were gestures and reactions of the interviewees to our questions that helped us interpret and understand how they felt. This adds to the analysis from a broader point of view. It considers the person's body language to understand their attitude toward the questions. The aim of the interviews were to elucidate the steep rise of mental health issues experienced by Puerto Ricans since Hurricane Maria, which signals mental health as an urgent public health crisis. These interviews reveal similarities and differences in the ways that everyone experienced the effects of Hurricane Maria.

The interviews were conducted by the research collaborators Yakira M. Ramos Montañez, Celinette Moyet Vargas and the researcher Genesaret Flores Roque. During the interviews, these three were students of UPR Cayey campus and were active in the course that led to this investigation "Experiences with Interdisciplinary Research for Students" (INTD4116). This course was about how students used resilience to cope with the situation that we faced during the hurricane. Currently, Ramos-Montañez graduated, Moyet-Vargas is in her fourth-year of her bachelors and Flores-Roque graduates on May 2022 and is headed to graduate school to complete a doctorate in Clinical Psychology (PsyD) that later will lead to a specialty in Forensic Psychology.

Those interviewed by Flores-Roque reside in the towns of San Lorenzo, Las Piedras and Trujillo Alto. Three towns in Puerto Rico that have both urban and rural areas. San Lorenzo is a town where the economy revolves mainly around the manufacturing industry (Grupo Editorial EPRL, 2018). Most of its population comes from the countryside and is made up of people willing to help anyone else in need. In Las Piedras, like San Lorenzo, the main economy is manufacturing, and the town is known as "La Ciudad Artesanal". The name of the municipality of Trujillo Alto is named for Spanish colonizer Alonso de Trujillo (Adorno Tapia, 2015), and as in the two previous municipalities, its economy is based on manufacturing. It is a town that is gradually modernizing. Something that distinguishes these three towns is the beautiful vegetation that surrounds them.

Those interviewed by Moyet-Vargas are from the towns of Cidra and Yabucoa, specifically from the sectors of Almirante in Rabanal and Jagüeyes in Aguacate respectively. Cidra is a rural town that has fifteen neighborhoods, small but full of people with big hearts. Cidra is mountainous, has a cold climate, and livestock and agriculture abound. Without a doubt it is a beautiful town, full of hard-working and caring people. It should be noted that the talent overflows from athletes, actors/actresses, to singers. The Sector Almirante del Barrio Rabanal de Cidra is in the central area of the island, it is quiet, and it is home to families and elderly people who are dedicated to agriculture. On the other hand, Yabucoa is a town located in the extreme southeast of the island that has ten neighborhoods. In this town, also known as "La Ciudad del Azucar", manufacturing and agriculture predominate. Ramos-Montanez interviewees also come from Cidra: Carmen from Estancias del Roble urbanization in the Certeneja sector—a rural area with several access control developments—and Ramon, who lives in front of Highway 172 in the direction of Caguas.

Flores Roque interviewed only university students who are between twenty and twenty-one years of age, some of whom shared their experiences in university classes after the hurricane. Moyet-Vargas interviewed people who were geographically located in different towns. In the

case of Yabucoa, as we know, it was where the hurricane entered. Celinette decided to visit neighborhoods and get an interview, similarly, in Cidra, which was also undoubtedly affected. Ramos-Montañez interviewed working-class people which allowed her to see the effects of the hurricane on people who had to leave their homes every day to do their jobs and the impact of seeing the destruction beyond their homes had on them.

Each of the participants has been assigned a pseudonym to protect their identity. Flores-Roque interviewed five students: Naomi, Arroyo, Lee, Sara, and Bartolomeo. As mentioned above, all participants were students who were between 20 and 21 years of age. Some of the interviewees come from different towns on the island; Naomi and Lee are from San Lorenzo, Sara and Bartolomeo are from Las Piedras. Finally, Arroyo is from the town of Trujillo Alto. Moyet-Vargas interviewed two people: Vilma and Carlos. Vilma is 20 years old, a university student and resides in the town of Yabucoa. Carlos is 75 years old, a veteran and resides in the town of Cidra. Ramos-Montañez interviewed Carmen, a teacher who lived in Cidra and is 43 years old. Ramon was the other interviewee, a 38-year-old man who lives in Cidra and is an electrician in a factory located in Caguas.

All Flores-Roque's participants are high school graduates, and in their third year at their respective universities. Naomi and Bartolomeo are completing a bachelor's degree in Natural Sciences with a concentration in Biology; Lee and Arroyo, a Bachelor of Business Administration with a concentration in Management; and Sara, a Bachelor of Community Health with a concentration in Nursing. All her interviewees, except Sara, come from the University of Puerto Rico in Cayey. The UPR Cayey campus is characterized by its beautiful landscapes and by its excellent students and professors. The campus was founded in 1967 and since then it has been one of the best venues in the UPR system. Its great faculty is distinguished by the excellent and the notable professionals that come out of UPR Cayey. As for Sara, her university is San Juan Bautista School of Medicine. It was founded in 1978 and is located on the grounds of the Hospital Menonita in Caguas. Those interviewed by Moyet-Vargas have different educational backgrounds: Carlos did not get his bachelor's degree in Accounting from the UPR Rio Piedras since he had to go to the Vietnam War. He only completed his freshman year of college. Vilma is currently in her third year of a Bachelor of Nursing at the Ana G. Mendez University, in Gurabo.

UPR Rio Piedras is the largest campus in the UPR System and the first public university in Puerto Rico. In its beginnings, it was the "Normal Industrial School," located in Fajardo, and only had 20 students and 5 teachers. It was dedicated to those who would become teachers. In 1901, the Normal Industrial School was transferred to Rio Piedras, still concentrating on teacher training. In 1903 the law that created the University of Puerto Rico at Rio Piedras was approved. It was also a key center of student struggles for the independence of Puerto Rico. The Ana G. Mendez University was founded in 1941 under the name of "Puerto Rico Junior College" by Ana Gonzalez de Mendez in Rio Piedras.

Regarding those interviewed by Ramos-Montañez: Carmen studied a bachelor's degree in Pedagogy at the University of Turabo in Gurabo. This university was founded in 1972 and received accreditation in 1974. In 2018, the university changed its name to Universidad Ana G. Mendez. Ramon is the first generation in his family to go to technical college. He obtained an associate degree in Electrical Technology from Mech Tech College in Caguas. This university has several university centers throughout the island and specializes in associate degrees and short careers.

We decided to minimize the information and choose six interviewees to elaborate a little more on them. We decided to choose these six specific participants because most of them are university students. This adds value to the study since we wanted to focus on a community that is not given as much emphasis when talking about mental health—young people. For those that are not, we generated a contrast between the ages of the participants. As can be seen in [Table 1](#) below, we also determine if the person is first-generation who attends university and if they have any psychological medical history.

Table 1. Essential information of the participants.

Pseudonyms	Age	Town	Gender	First generation to go to college?	Education	Psychological medical history?
Naomi	20	San Lorenzo	F	No. Her mother has a Bachelor's Degree in Pedagogy	Highschool graduate. Currently at her third year of Baccalaureat	No
Sara	20	Las Piedras	F	Yes	Highschool graduate. Currently doing a Bachelor in Nursing	Yes, from nine to ten years of age
Vilma	20	Yabucoa	F	Yes	Highschool graduate. Currently doing a Bachelor in Nursing	No
Carlos	65	Cidra	M	Yes. He started college but only took one year because he had to go to war	Highschool graduate	Yes, he suffers from PTSD, depression, anxiety and
Carmen	43	Cidra (P.R.) / Virginia (EE.UU.)	F	No. Her mother has a Bachelor's Degree in Pedagogy	College graduate with a Baccalaureate in Pedagogy	Yes, after moving to Virginia
Ramon	38	Cidra	M	Yes	College graduate with an Associate's Degree in Electricity Technology	No

Flores-Roque did the interviews withing a month, and each one lasted approximately 20 minutes. The interviews with Arroyo, Bartolomeo and Lee were carried out at the UPR Cayey campus. The interview with Naomi was done at the Starbucks located in the town of Caguas since the participant found it more comfortable there, while Sara was interviewed at her home. The atmosphere in Sara's house was very relaxing and welcoming. She lives in a house located in the town of Las Piedras; Sara's family received the interviewer very well and she was able to complete the interview without any discomfort or problem.

It took Moyet-Vargas two weeks to do the interviews for two people. Each interview lasted approximately 13–15 min. The interview with Vilma was at her home in Yabucoa. Her house is on a mountain with an amazing view; from there you can see the coast, the Yabucoa valley and the other mountains that surround the valley. Carlos's interview was also at his home in Cidra. To get to his house, you must climb the mountain and once you get there, the view is also very impressive; you can see the Naranjito's Jesus Izcoa Moure Bridge, or best known Naranjito cable-stayed bridge, which unites Toa Alta and Naranjito cities. This bridge is above the longest river of Puerto Rico: Rio de la Plata. Also, you can see part of Comerio and the coast of Dorado. Ramos-Montañez took between 40 and 60 min to complete each interview in a week, we simply sat in a comfortable place for the interviewees. Carmen's interview was at her home in Virginia. The house has two floors, on the first floor is the living room, dining room, kitchen and on the second floor there are three rooms and a bathroom. There is not much decoration, only some photos of the family and most of the furniture and electrical appliances are second hand. Ramon's interview was in his apartment in Cidra which has a living room, dining room and kitchen together and a room, his furniture is old but modern as well as his electronic devices.

We divided the interview into three categories of time: before, during and after Hurricane Maria. Each of the questions in the different categories caused the participant to go back in their memory and recall in detail the events of that period. We realized that the real suffering occurred after the hurricane. During the hurricane, people were scared and very anxious, but it was later that the real suffering was perceived, either due to material loss or their emotional state. Next, in [Table 2](#), we include the questions that were asked of the participants.

At the end of the interviews, we concluded that we could categorize ourselves as “insiders”. Like all our participants, we are Puerto Ricans who lived the experiences of before, during and after Hurricane Maria. Unfortunately, we can say, like our interviewees, that it was not a pleasant experience. As for Flores-Roque, Hurricane Maria was not expected to have the effect it had on her life. Her mental health before the hurricane was very good, it was her first year in college and she felt that nothing could take away her motivation. She considers that the hurricane was one of the worst experiences of her life. She had to take care of her mother (who was experiencing constant anxiety attacks) and help her father who was outside their home in the middle of the hurricane trying to prevent his street from flooding as the sewers were blocked. She did all this alone and was the main source of support for everyone in the house, although there was no one to comfort her the night of the hurricane. After the hurricane her situation deteriorated, her mental health declined dramatically. Her parents were required by their employers to return to work quickly, and her brother left with friends all day. Therefore, she was left alone in the house, with full responsibility for the household chores around the house. Her neighbors came and went, and she had no one to spend hours with, be it playing games or talking. The situation reached a point where she spoke to her puppy so as not to feel the house so empty. The desperation of wanting everything to return to normal was draining all her sanity little by little.

In the Moyet-Vargas case, she considered her mental health before Hurricane Maria to be stable, she had clear goals, and she was doing well in high school and in sports. She was not mentally prepared for a hurricane like Maria. She did not know what the intensity of a Category 5 hurricane entailed and believed that it was something equal to the storms that had already passed through the island before Hurricane Maria. She relates that her experience during the hurricane was horrible: Although she managed to cope with the start of the terrible night by clearing her mind by painting, later in the night she had to stay locked in the bathroom with her mother and brother because in the rest of the house water was getting in and that was dangerous. This led to anxiety attacks during the hurricane. After the hurricane, she considers that her life was “in nothing”, that her plans were in nothing, that her goals were in nothing, that her dreams were lost. Her mental health after the hurricane was meaningless.

After all this, we can conclude that there is a lot of similarity between the experiences of the people interviewed and the experiences that the authors lived. Therefore, we can identify and sympathize with the participants of our research.

## Results

The nine interviews carried out were semi-structured and consisted of 12 questions (the previously listed ones shown in [Table 2](#)). Each interview was conducted in the place where the interviewee felt comfortable, whether it was at home, the university, a food place, etc. After finishing the interviews, a transcription process was carried out to facilitate the extraction of the quotes that most impacted us. This process took about a month. At the end of the transcription process, we proceeded to extract the phrases that most impacted us by eloquently conveying the feelings of that period and deciding in which categories we would put them. For this, we decided to use the “memos” method, which consists of compressing the quotes that impacted us the most and analyzing each of them in order to focus on specific categories. For the investigation, we agreed to use the categories of Mental State, Social Crisis, Aftermath (or sequel) and Own Experience, which we define below.



**Table 2.** Guide questions for the interviews.

Before	During	After
1. How would you describe your life before hurricane Maria?	1. What was your experience during hurricane Maria?	1. How do you think your life was weeks after hurricane Maria?
2. Do you consider that you prepared yourself mentally for the hurricane? Explain how or why	2. What thoughts were running through your head as the hurricane passed?	2. How do you describe your mental health after Maria?
3. How would you describe your state of mental health before Maria?	3. How did you cope with everything that was happening that night?	3. Do you think you were or are in need of a professional in the field of mental health (psychologist, psychiatrist, etc.)? Why?
		4. What adjustments did you have to make to return to your study / work area?
		5. How do you feel about hurricane Maria?

## Mental state

For our research, the issue of mental health is of the utmost importance since we want to know how Puerto Ricans were psychologically affected before, during and after Hurricane Maria. It should be said that the subject of mental health in Puerto Rico is taboo. People who seek help related to their mental health are considered “crazy” or incapable of solving their own problems, with the implicit premise that problems must be solved completely autonomously, independently, separately, without involving anyone else. During our interviews, we realized that many of the quotes were related to each other in terms of the mental state of each participant. Therefore, we decided to separate this topic and establish it as a category in our memos. Mental health is an extremely important issue in society. It is necessary to recognize it to be able to work it. That is the purpose of establishing this category in our research: to recognize the mental state of our interviewees and to be able to provide them with a safe space to share and vent about the situations surrounding Hurricane Maria. Each quote chosen in this category relates, in one way or another, with the mental state of the person interviewed.

I knew that if I stayed alone at home longer and did not start university, I would have needed professional help, because I was already at a point where everything affected me. I felt so desperate. I didn't know what I was going to do with my life. I was never going to go back to normal.

—Naomi, Caguas, P.R

Naomi is a 20-year-old student studying at UPR Cayey. Currently, she is staying in the same town of Cayey, but at the time the interview took place, she was living in the town of San Lorenzo. In the interview, she was asked if she considered having professional psychological help after the hurricane. Naomi answered a resounding “Yes!” When the question was asked, she looked extremely sad. After the hurricane, the UPR Cayey campus sent a statement to its students encouraging them to seek help at its Interdisciplinary Center for Student Development (CEDE), where counseling was offered to all students who had been affected by the hurricane. However, as Naomi got back into a routine, she didn't feel the need to attend.

From this quote, it can be interpreted how Hurricane Maria deprived people of everything we do every day. Many people had to resign themselves to spending the entire day alone at home without any form of entertainment or communication with the world. Due to that experience, in Naomi's case we see that her mental health was greatly affected by feeling so alone and without any way to distract herself from all the chaos and damage that the hurricane caused.

Seeing that my parents' sacrifice for so many years was gone in a second was what affected me the most that night.

—Sara, Las Piedras, P.R.

Sara is 20 years old and studies at the San Juan Bautista School of Medicine in Caguas. She lives in the town of Las Piedras and is about to finish her bachelor's degree in Nursing. This quote arose when we asked her to describe in detail what her experience was during Hurricane Maria. At that point in the interview, Sara recounted how the hurricane washed away the house that her parents worked so hard to build. With this quote, we see the suffering and material loss that this natural phenomenon caused. In fact, Sara tells us later that, after going through this experience, it has been very difficult to fully recover financially, and that situation has significantly affected her mental health. To this day, Sara's family lives on the ground floor of the maternal grandmother's house. This has been the most shocking quote from this investigation. As she recounted her entire experience during the hurricane, Sara couldn't help but shed a few tears. For her, what her family went through that night was horrible, and to say that all her parents' sacrifice was gone in a matter of seconds shocked her greatly. She had to take a moment. With this quote we see that while Hurricane Maria caused so much material damage, it also caused damage to the mental health of those affected. In one day you have everything and, in a matter of seconds, a hurricane can take away everything you have created with so much sacrifice.

The last voice message I received from my sister was at 4:00 am, she told me that the window of our room had been torn off, that a lot of wind was coming in, that everything was going to explode and that they were going to die —that's how desperate she was— that was very concerning to me and didn't help the situation much.

—Lee, Cayey, P.R

The feeling that I felt the most was fear. Fear of losing my life or that one of mine would lose it.

—Lee, Cayey, P.R

Lee is 20 years old and studies at UPR Cayey. She is currently staying in Cayey, but at the time of this interview she was living in the town of San Lorenzo with her family. Lee experienced the hurricane at Hospital Menonita, in Caguas, where her mother works. On the first quote, she tells us how difficult it was to receive the last voice message from her sister, in which her despair and that they felt they were going to die was clearly heard. This voice message was the last communication between Lee and her sister for a week. She tells us that her mental health was shattered in those days because all she could think about was wondering what had happened to her family and when she got home would everyone be okay? As Lee recounted this part, she seemed overwhelmed, as if remembering the events of that night had been hurting her. She said she felt extremely helpless that night. Hearing her sister who was afraid for her life and being unable to do anything, made her lose control. This experience serves to illustrate that the intensity of the hurricane created a sense of hysteria across the island, so that many thought they would never see the light of day again.

For the second quote that we chose to highlight, she had been asked if she could relate in detail what her experience was during Hurricane Maria. As described above, Lee spent the entire time at the hospital where her mother worked. She told us about the chaos in the hospital and how all the people around her were "in their worlds" and that didn't help her feel any better. After she had this communication with her sister, the only thought that crossed her mind was the one described in that quote: she feared for her life and that of her family. Again, we see the fear that Hurricane Maria instilled in Puerto Ricans that night. At that time, Lee now recounts how her only concern was her life and that of her family; she feared for her health and prayed that nothing would happen to any loved one. Maria was a trigger for many disorders, and anxiety was one of the most prominent. The fear generated by the rains, winds and intensity is something that greatly affected the mental state of many Puerto Ricans.

## Social crisis

The category of social crisis refers to the crisis on the island due to lack of resources, poor infrastructure and inaccessibility after the hurricane, and how this had repercussions on the mental health of Puerto Ricans. As we know, after Hurricane Maria, the island faced a humanitarian crisis due to the lack of basic services such as electricity and drinking water. On top of that, the government's inaction on supplies after the hurricane had contributed to that crisis. The importance is that it shows the state in which the interviewees experienced the social crisis and the impact this had on their mental health.

I was not mentally prepared to be 7 months without electricity, I did not think that I would be so many months without signal, I did not think that I would be so many months without water.

—Naomi, Caguas, P.R

Mom would take a pail, put a sheet over it so that when it rained the water would filter and with that we would bathe.

—Naomi, Caguas, P.R

On the first quote, Naomi answers the question of whether she was mentally prepared for the hurricane or not. From the quote, the poor performance of the government contributed problems, affecting thousands of Puerto Ricans like Naomi: the lack of vital resources, such as electricity and drinking water. On the other hand, in the second quote, she tells us an aspect of her life weeks after the hurricane. From this, it can be interpreted that the lack of resources made Naomi and her mother look for a way to cope with a lack of water, perhaps putting their health at risk by being exposed to bacteria or other diseases in the effort to bath. These risks were taken to survive the conditions that were made worse from the lack of resources vital to their life and health.

I had to make adjustments to my college schedule as the road was super bad (trees, holes, etc.) and there were a lot of single lane roads.

—Sara, Las Piedras, P.R

I was leaving college late at night and it was all dark. There was no traffic light, there were no [light] poles, there was nothing, and there was no [cell phone] signal either. [So] if

something happened to you, you couldn't make a call.

—Vilma, Yabucoa, P.R

Sara is a university student currently pursuing her Bachelor of Nursing at the San Juan Bautista School of Medicine in Caguas. Vilma is also a 20-year-old university student, is studying a bachelor's degree in Nursing, and currently lives in the town of Yabucoa. In both interviews they were asked about the adjustments they had to make to return to their study/work life. From each quote, it is possible to interpret the deteriorated conditions of the country after the passage of Hurricane Maria and the late response of the government to address this problem. Also, the insecurity of living in a country where at that time nothing was safe is evident. The fear of losing a job or the uncertainty of whether to continue studying were problems that Puerto Ricans faced every day. Living in a place where your own life is at risk due to the aforementioned factors represents a social crisis for its population.

## Aftermath

For the investigation, the Aftermath category is of utmost importance to know how Puerto Ricans felt and what their experience was after the hurricane. This section details the personal experiences of Puerto Ricans, the situations they faced, the adjustments they had to make to

return to what was their daily life, and the coping mechanisms that helped the interviewees cope with the aftermath.

Carlos is a 75-year-old veteran, resident of Cidra. We decided to interview Carlos because being a veteran makes him different from the other participants in the research. In addition, he was chosen to be able to make a comparison between generations regarding how to handle difficult situations. Also, the fact that he is a veteran, and his life history sheds light on the experiences of other vulnerable groups that are not discussed in terms of mental health: those who already suffer from a mental illness and/or go through other traumatic events that worsen their current state of mind. This gives a touch of peculiarity to our research since, not only do we give people a space to talk about what is bothering them, but we also give those who already suffer from mental illnesses a space to speak openly about how they feel, without being judged or cast aside.

I follow the veteran treatment, the only thing that has changed is that before I did not suffer from high blood pressure. My pressure has risen.

—Carlos, Yabucoa, P.R.

Not sleeping much. Sometimes when I go out there, I go into the farm, transport myself to Vietnam and cry.

—Carlos, Yabucoa, P.R.

On the first quote, Carlos answers the question of how he considers the state of his mental health after Hurricane Maria. His reply seemed very sad to us since his mental health was affected by factors beyond his control. For him, the aftermath of the hurricane was a torment of irritating memories of his time in the war. Fighting post-traumatic stress disorder (PTSD) caused by the war and re-experiencing an event that was also traumatic makes everything complicated. The way to cope, in terms of his PTSD episodes, for Carlos was to get out of his house and walk around the farm, but when Hurricane Maria destroyed his farm too, somehow, it rolled over the nest of memories and past traumas. This makes the situation worse because not only are you battling a past trauma, but a new one—the hurricane—is adding to it, affecting your current emotional stability. Regarding the second quote, Carlos pauses briefly before answering the question about the things he does now—after the hurricane—that he didn't do before the hurricane. His response shocked us a lot, as the tool that previously worked effectively to keep his mental health stable has been hampered by conditions over which he has no control. It is difficult to overcome past trauma when we constantly have vivid reminders of it around us.

It was spending hours and hours in lines to buy a gallon of gasoline, hours to get money in the bank. Horrible rows. Because it was like having money and not having it at the same time. Eat what there was on the day because there was no electricity for you to make a purchase and bring it home, nor was there enough food. To wash we had to go to a river that was close to the house.

—Vilma, Yabucoa, P.R.

In this quote, Vilma answers the question about what her life was like weeks after Hurricane Maria. We believe that all of us who lived through the aftermath of Hurricane Maria can identify with what she tells us. Life after the hurricane was quite an adventure, where the main motivation was need and the goal was survival. Looking back in time, we realize that the despair and fear that Maria generated can still be perceived as reactions to the slightest attack on the security of Puerto Ricans today. Unfortunately, we have been traumatized. The aftermath of Hurricane Maria continues to affect everyone. Fear is seen in the very long lines when it is announced that there will be a storm, and despair is seen in the empty shelves of the supermarkets when the possibility arises that, perhaps, there are limited supplies. After Hurricane Maria, we lived through strong moments and conditions that generated trauma and were difficult to overcome.

## Insider researchers' experiences

The main reason for carrying out this research was to know more about how Puerto Ricans were affected after Hurricane Maria. Since we went through the experience, we classified ourselves as “insiders,” and therefore we decided to create a section about our experience. To create an analytical memo, we decided to ask ourselves the same questions we asked in the interviews. Thus, we were able to give context and include our experience in the research work; we believe that this research has been of great help to our mental health and in terms of how we have been able to cope with Hurricane Maria. We have been given a space where we can express everything we felt in that period and also discover from the interviews we were not the only ones who were affected. Our findings have helped us channel feelings of loneliness, anxiety, and others, and provided an opportunity to teach the world that not only were there physical and material damages, but Puerto Ricans also experienced great damage to mental health. We learned that it is necessary to express your feelings and not contain them since we can be significantly affected and only see the consequences when it is too late. We are more than grateful and relieved to have the opportunity to do this research and to inspire more communities to talk about the psychological effects Puerto Ricans suffered before, during and after Hurricane Maria.

That night I had to assume the role of an adult in my house as my mother was having many anxiety attacks, one after the other. Seeing my role model in that state completely shocked me, but I had to take responsibility and watch over all of them (my family) that night. I can truly

say that it was the worst experience of my life.

—Genesaret, Juncos, P.R. February 28, 2020.

[My mental health was] almost non-existent. My parents were sent to work quickly and my brother used to go all day with his friends. Therefore, I was left alone with all the responsibility of the house. My neighbors came and went. I had no one to spend hours with, either playing or talking. I got to a point where I would talk to my puppy so as not to make the house feel so empty. The desperation of when everything would go back to normal was draining all my sanity.

—Genesaret, Juncos, P.R. February 28

In the first quote she describes her experiences during the passage of Hurricane Maria. That night was very hard for Flores-Roque she had to assume a role that did not belong to her. Flores-Roque's dad spent the entire hurricane outside trying to unclog their sewer so that the street wouldn't flood, so she had to watch out for him and help him if necessary. On the other hand, she had her mom in the room with panic attacks, leaning back and forth, praying for it to all end. Thanks to these factors, Genesaret-Flores had to ignore all her feelings of fear and worry to help her entire family.

On the second quote it was asked how you perceive your mental health after the hurricane. Flores-Roque replied that it was almost non-existent. The weeks and months after the hurricane were the hardest for her. Since no one was at home during the day, loneliness and anxiety enveloped her. Flores-Roque had to assume roles that did not belong to her since she was always in charge of the house. She was responsible for making sure everything was ready—the food, the water, the clean house, the [solar] electronic gadgets charged for the night, etc.—for when her parents and my brother arrived. It was very overwhelming and exhausting for her, both physically and emotionally.

The feeling of loneliness in situations like these is something that no human being should feel and, unfortunately, many Puerto Ricans had to experience it. Based on Flores-Roque's experience, many people had to perform tasks or roles that did not correspond to them, to provide time and space for things in their home or community to stabilize. The hurricane caused the feeling of loneliness, anxiety and/or depression to increase in people, thus causing a great need for professional psychological help.

During the night my mom, my brother and I were in the bathroom, which only had one window. And with only having a window there was little air, so several times I ran out of air and

this caused anxiety attacks in the middle of the hurricane. We had to be in the bathroom since the water was pouring in through the windows in all three rooms, just like in the kitchen. In the room as well, and it was also dangerous to be there since there was a glass door that could either open or explode at any moment.

—Celinette, Caguas, P.R February 28, 2020.

Not knowing what was going to happen, my goals were lost, I went off course, I "derailed", so to speak. My state of mental health after Hurricane Maria was sensitive, I felt

vulnerable.

—Celinette, Caguas, P.R February 28, 2020.

On the first quote, the question was posed of how one coped during the night of the hurricane. The night of 20 September 2017 was one that seemed endless to Moyet-Vargas and her family. It was not easy for her to stay in control and calm when she saw all her things fill with water, when she heard the horrible noises that the wind and rain made on the windows and glass door, and when she felt that the house was going to fall, and she and her family were going to die. Thinking of everything that could happen and the feeling like it wasn't going to stop caused her anxiety. Moyet-Vargas tried to control it by distracting herself with games and music on her cell phone. There came a point where she could no longer ignore the fact that they were all in the bathroom, because the whole house was unsafe and on top of that, she couldn't breathe properly. That feeling of insecurity, which Moyet-Vargas experienced when she realized that everything she considered safe—her home—was no longer safe and that the only thing she had to protect herself was a bathroom, caused a lot of fear and anxiety.

The second quote responds to how Celinette felt after the hurricane:

Moyet-Vargas was nowhere. Her mental health was in a vulnerable state by not knowing what was going to happen with the classes at the university and with her life —whether it was going to continue the same or not. She felt like nothingness, like it was all over for her. Having that uncertainty, Moyet-Vargas goals were no longer clear. Her dreams were limited and, when she realized it, that part of her that felt sure of what she wanted to achieve one day had already been lost.

## Conclusion

In conclusion, Puerto Rico should begin to normalize discussions about mental health. It is extremely necessary to stop considering this topic as taboo and to start working on it in a much more widespread way. As this and other research has shown, the number of suicides has increased since Hurricane Maria and this is something that is not given much emphasis. Much of the aid that was provided after the hurricane was to respond to the physical and material damage on the island. We believe that efforts around people's mental health, after a natural disaster, should be comparable and just as important to those directed to respond to physical damage.

After this investigation and observing the psychological damage that this natural disaster produced, we urge all institutions to act on the matter with this serious problem that we have been dealing with from Maria. It is necessary to begin to recognize mental health as a problem that has a solution if it is given the necessary attention. For this, campaigns could be created that raise awareness about mental health and its importance for well-being. In the media (social media, press, etc.), the problem could be emphasized more. Support groups could be created in the communities or in different towns on the island. Finally, the matter should have a greater focus on the part of the government.

Currently, the University of Puerto Rico in Cayey has the Interdisciplinary Center for Student Development (CEDE), where professional counseling and psychology services are offered to

students enrolled in this university campus. Its staff is comprised of three licensed psychologists, two professional counselors, and a vocational rehabilitation counselor. This center provides a variety of free and confidential mental health services, including individual and group counseling/psychotherapy, crisis intervention, and consulting to the university community. Additionally, these mental health professionals offer workshops and conferences for faculty, staff, and student organizations on academic, mental health, interpersonal, and personal wellness topics.

We consider that it is a very complete system that benefits the students, but to increase its impact we recommend more publicity in the university community and the development of a teleconsultation system. Advertising on campus is extremely important as the information would reach more students who may need these services. On the other hand, a teleconsultation or telepsychology system would be very convenient since it could benefit students who work or have other responsibilities outside the university, which does not allow them to stay after their classes. This system would have the purpose of offering remote consultations, diagnoses, evaluations, interventions and treatments through the processing of information using electronic methods (Adonahi, 2019). Applying innovations like these would greatly benefit students who, due to personal situations, cannot attend professional consultations or counseling in person.

To improve the mental health care situation on the island, it is necessary that these issues are recognized and given the importance they deserve. This is a job that must be carried out together in society. Therefore, the faster we begin to break the taboo of talking about mental health and recognize psychological or emotional vulnerability as normal in human beings, the sooner we can begin to improve this problem on the island.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Notes on contributor

**Genesaret Flores Roque** is a undergraduate student studying at the University of Puerto Rico at Cayey. She graduates in June 2022 from a baccalaureate in Psychology and Mental Health of the Community and applied to the Ponce Health and Science University for a Doctoral degree in Clinical Psychology.

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