

Social and Health-related Changes in Hispanic Cancer Patients during the COVID-19 Lockdown

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Objective: The current study aimed to explore changes in health-related behaviors and social practices in Hispanic cancer patients during a government-mandated lockdown and their relationship to sociodemographic and clinical characteristics.

Methods: Secondary analyses were conducted on data gathered by a longitudinal cohort study to describe the unmet needs of Hispanic cancer patients living in Puerto Rico exposed to Hurricane Maria in 2017, earthquakes in 2020, and COVID-19. However, our study solely focuses on the data from the COVID-19 pandemic period.

Results: Most participants were women ($n = 72$) with breast cancer (81.2%). Participants exhibited changes in religious practices (60%), physical activity (58.4%), and sedentary behavior (50%); 31.4% experienced changes in eating habits and sleeping patterns. Responses to the study questionnaire involved staying connected with family (85.5%) through phone calls (78.2%); 69.9% of the participants reported observing shifts in the family dynamics. A strong majority endorsed the government-imposed isolation measures (95.6%). Patients not undergoing treatment were likelier ($r = -0.324$; $P = .010$) to support the measures. Finally, younger patients experienced more work-related changes ($r = -0.288$; $P = .017$) and were less inclined ($r = -0.293$; $P = .011$) to find the isolation measures appropriate.

Conclusion: This paper describes the lockdown-related changes in health and social behaviors sustained by cancer patients, changes which could potentially impact their overall health and health-related quality of life. Our results fill an existing gap in our findings and contribute to understanding the experiences of cancer patients (in particular, Hispanic patients) during the COVID-19 pandemic.

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In December 2019, the first COVID-19 cases were identified in Wuhan, China (1), and on March 11, 2020, the WHO declared a worldwide pandemic (1,2). In Puerto Rico, no COVID-19 cases were detected during this period; however, several suspicious cases would eventually be confirmed as being positive for COVID-19 in the following weeks (3). As a precautionary measure, on March 12, the Puerto Rican government ordered an island-wide lockdown, which was enforced from March 15, 2020, until June 15 of that same year (4,5).

The global public health measures established to control the COVID-19 pandemic provoked unprecedented societal norms and behavior changes. In Puerto Rico, for example, the initial lockdown included rigorous measures, such as a 24/7 stay-at-home isolation mandate, full commerce closures, and a strict curfew that allowed citizens to leave their homes only if there was an urgent need to visit a hospital, doctor, or financial institution or to buy groceries or medication. Additionally, strict mask use, social distancing, and body temperature verification were strictly enforced (6).

Cancer patients were particularly vulnerable to the COVID-19 pandemic, and many experienced changes due to nationwide lockdowns (7,8). As a result, cancer patients experienced cognitive, emotional, and mental health vulnerabilities, such as loneliness, anxiety, and depression (7,8). During the pandemic, cancer patients employed various coping mechanisms to navigate the

challenges presented. Some of these included practicing self-care, engaging in hobbies, participating in physical activities, fostering acceptance, seeking emotional support, practicing positive reframing, managing their time effectively, finding humor, adjusting their diet and spirituality, and engaging in religious practices (9–12). Moreover, these patients faced disruptions in oncologic treatment and services, such as surgery, chemotherapy, and radiotherapy, amidst the COVID-19-imposed lockdown (7,8,13).

When the COVID-19 pandemic started in Puerto Rico, individuals living in Puerto Rico were still suffering in the aftermath of multiple recent natural disasters. In 2017, Hurricane Maria, a category 4 hurricane, impacted the island and left millions without water or electricity—leading to massive structural damage—destroying thousands of homes, and causing nearly

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3,000 deaths (14). Just 2 years later, while recovering from the hurricane, Puerto Rico suffered multiple earthquakes, adding to the existing island-wide structural damage and leaving many without homes (15).

A characteristic trait of a lockdown is social isolation; during the pandemic, the isolation that resulted from the lockdown led to reducing the COVID-19 spread (16). However, another feature of such isolation is that it can contribute to feelings of fear, hopelessness, (17) and loneliness (16) in individuals.

Another area affected by the pandemic is job security. Many individuals lost their jobs or faced work-related changes, such as needing to work remotely or changing their positions (18). Furthermore, the general population experienced changes in health-related behaviors related to weight (19), food consumption (20), sleep (21), and physical activity (19).

Puerto Rico was not the only region that enforced a lockdown during the COVID-19 pandemic (22). Nations on every continent implemented regional and nationwide lockdowns; some of these nations have studied the effects of the lockdowns on health behaviors and mental health (23–26). To the best of this team's knowledge, no existing study has examined how the lockdown affected the health behaviors and social dynamics of Puerto Rican cancer patients, leaving a gap in the literature, especially as regards Hispanic cancer patients, in general. This study aimed to fill this void by investigating the impact of COVID-19 lockdowns on the health behaviors and social practices of cancer patients in Puerto Rico. It also explored the associations between the lockdown-related changes and the sociodemographic and clinical characteristics of the study population.

Methods and procedures

Parent study

The parent study investigated the impacts of the 2020 earthquakes in southern Puerto Rico and the COVID-19 pandemic on health determinants among Puerto Rican/Hispanic individuals with cancer. It hypothesized that exposure to Hurricane Maria, the earthquakes, and the pandemic influenced health determinants in these individuals by erecting barriers to healthcare and exposing them to disaster-related stressors. The study included cancer patients and controls, using a matched-pair design with 75 participants in each group. The cancer patients had medical appointments during the period following Hurricane Maria, while the controls (who had not been diagnosed with cancer). The participants were Hispanic, aged 21 or older, residing in Puerto Rico during Hurricane Maria, and without cognitive impairments. Recruitment was done between January 2018 and September 2020 through collaboration with community partners. The data collection involved various instruments that assess sociodemographic, clinical, and lifestyle factors, was accomplished using the phone or a telehealth platform, and lasted approximately 60 minutes, in either case.

Secondary analyses

The sample for these secondary analyses comprised 75 patients with cancer. The primary focus of the secondary data analyses was to examine changes in the health-related behaviors and social

practices of cancer patients in Puerto Rico during the COVID-19 pandemic. Notably, data related to Hurricane Maria and the 2020 earthquakes were not considered for these secondary data analyses. All the study procedures were approved by the Ponce Research Institute Institutional Review Board (180611-EC). For these secondary analyses, the team pooled data from the parent grant's database. The next two paragraphs describe the bulk of the information collected, while the third is the name of the instrument used to collect the rest.

Sociodemographic characteristics

The data were obtained from a questionnaire developed by the study team; it gathers information regarding, age, sex, socioeconomic status, and other sociocultural variables. For this manuscript, we extracted and included the variables seen in Table 1.

Clinical characteristics

To describe the sample in the present manuscript, we collected variables regarding clinical aspects such as cancer type, cancer treatment, metastasis, and others. For this manuscript, we extracted and included the variables seen in Table 1.

The Social and Behavioral practices (COVID-19) questionnaire

This instrument was designed by a research team at Rochester University to collect data on changes in social practices and health-related behaviors during the COVID-19 pandemic lockdown. It has a structured interview, with the first part asking about coping with the isolation measures established during the lockdown. The second part of the instrument collects data regarding changes in social practices and health-related behaviors during the lockdown. If participants noticed changes in their behaviors, they are asked to specify how often they engaged in these (changed) behaviors—that is, more or less frequently than the original behaviors

Theoretical framework

The syndemic framework is a conceptual model that emphasizes the co-occurrence of multiple epidemics within specific contexts and their synergistic interactions, encompassing both the spatial concentration of diseases and the mechanisms underlying said interactions. This approach provides a holistic understanding of population health dynamics and informs the development of targeted interventions to address the complex interplay between diseases and social determinants. Within the COVID-19 context, this framework describes the interaction between the pandemic and non-communicable diseases, such as cancer. This relationship has led to significant shifts in various aspects of non-communicable disease management, including physical activity, mental health, and access to healthcare services and medication (27). Applying the syndemic framework to cancer research in low- and middle-income countries, themselves approximately equivalent in terms of their economies to Puerto Rico, involves examining how various social determinants of health, infectious diseases, and non-communicable diseases interact within vulnerable populations. Applying the syndemic framework (focusing on cancer) in Puerto Rico can help in the identification of the specific social and medical factors and the social and structural inequities that may contribute

to disease clustering and adverse health outcomes and hinder effective healthcare delivery (27,28).

Data analyses

Descriptive statistical analyses (frequencies and percentages) were conducted (using IBM SPSS, Version 29) to describe the sample’s sociodemographic and clinical characteristics and assess the changes of health-related behaviors during the COVID-19 pandemic lockdown. This approach allowed for a detailed examination of the shifts in health-related behaviors within the context of the pandemic-induced restrictions. The nonparametric Spearman correlation (29) was then performed to determine the relationships between sociodemographic variables (such as age, academic level, and household income) and clinical variables (including cancer metastasis, stage of cancer), remission [when present], and absence of cancer treatment) with COVID-19-induced social and work-related changes.

Results

Sociodemographic and Clinical characteristics of the Sample

The sample consisted of 75 individuals with an average age of 59.2 (SD: 11.4) years; the majority (72; 97.3%) identified as female. Moreover, a significant proportion of the participants reported being married (29; 38.7%), and 15 individuals (20%) were employed at the time of the survey. Notably, more than half of the respondents disclosed having an annual income below \$19,000 (68; 91.9%), contributing to the understanding that a majority of the sample (49; 65.3%) perceived their incomes as insufficient to cover their needs and expenses. Education-wise, the overwhelming majority had attained at least a high school education (68; 91.9%).

Regarding the prevalent diagnosis, a notable majority of the participants were women diagnosed with breast cancer (58; 81.2%). In terms of treatment, the predominant interventions were surgical procedures (63; 77.8%), followed by chemotherapy (56; 77.8%) and radiotherapy (41; 60.3%). A detailed overview of the sociodemographic and clinical characteristics of the study cohort is provided in Table 1.

Frequencies and changes in Psychosocial and Health-related behaviors during the Lockdown

Table 2 presents the frequency and percentage changes in various psychosocial and health-related behaviors within our study cohort. The data revealed that a significant proportion of participants (42; 60%) reported alterations in their religious practices, followed by a considerable number of participants (37; 58.4%) who experienced changes in physical activity levels. Half of the participants (35; 50%) reported increased social media use and sedentary behavior. Additionally, 44.3% of the participants (31) observed changes in their consumption of tailored news. A considerable number of participants (22; 31.4%) experienced

Table 1. Sociodemographic and clinical characteristics

Variable	Patients, n = 75 Mean (SD)/f (%)
<i>Sociodemographic characteristic</i>	
Age	59.2 (11.4)
Sex (female)	72 (97.3%)
Civil status (married)	29 (38.7%)
Employment status (employed)	19 (25.3%)
Income (\$12,000 – \$19,000)	49 (67.1%)
Education level (high school or higher)	68 (91.9%)
<i>Clinical characteristic</i>	
Type of cancer	
Breast	58 (81.2%)
Colon	3 (4.2%)
Lymphoma	3 (4.2%)
Ovaries	2 (2.8%)
Stomach	2 (2.8%)
Other	5 (7.0%)
Metastasis (yes)	14 (20.6%)
Cancer treatment	
Radiation therapy	42 (58.3%)
Chemotherapy	57 (79.2%)
Surgery	65 (90.3%)
Hormone therapy	13 (18.6%)
Family history of cancer (yes)	59 (88.1%)

changes in their eating habits and alterations in their sleeping patterns. Moreover, 28.6% of the participants (20) noted changes in their binge-watching habits, similar to the 28.4% of individuals (20) reporting changes in their consumption of mainstream news. Finally, regarding food insecurity, 20% of the participants (14) reported negative changes in their access to food.

Frequencies and changes in Social practices during the Lockdown

Table 3 provides an overview of the frequencies and percentages reflecting social and work-related changes attributed to the

Table 2. Frequencies and percentage of changes in Psychosocial and Health-Related Behaviors

Psychosocial behavior	No change	Change	More	Less
1. Sleep	48 (68.6%)	22 (31.4%)	5 (22.7%)	17 (77.3%)
2. Eating a healthy or well-balanced diet	48 (68.6%)	22 (31.4%)	11 (50%)	11 (50%)
3. Physical activity	32 (45.6%)	37 (58.4%)	14 (36.8%)	24 (63.1%)
4. Smoking	67 (97%)	3 (3%)	3 (100%)	-
5. Cannabis use	69 (98.6%)	1 (1.4%)	1 (100%)	-
6. Drinking alcohol	66 (94.3%)	4 (5.7%)	3 (75%)	1 (25%)
7. Mainstream news	49 (71.6%)	20 (28.4%)	16 (80%)	4 (20%)
8. Tailored news	39 (55.7%)	31 (44.3%)	22 (71%)	9 (29.1%)
9. Binge watching	50 (71.4%)	20 (28.6%)	17 (85%)	3 (15%)
10. Use of social media	35 (50%)	35 (50%)	31 (88.6%)	4 (11.5%)
11. Being sedentary	35 (50%)	35 (50%)	35 (100%)	-
12. Food insecurity	56 (80%)	14 (20%)	14 (100%)	-
13. Religious practices	28 (40%)	42 (60%)	12 (28.6%)	30 (71.4%)

COVID-19 lockdown measures. The data show that nearly all the participants (65; 95.6%) agreed that the government's isolation measures were appropriate. Moreover, a significant majority of individuals (59; 85.5%) found ways to stay connected with family members, primarily relying on phone calls (47; 78.2%) to do so. Additionally, a substantial proportion of participants (48; 69.6%) reported experiencing changes in their family dynamics while adhering to preventive measures (27; 56.7%). Lastly, 17.6% of the participants (12) indicated changes in the workplace.

Correlation analyses of Sociodemographic and Clinical variables

A significant moderate negative correlation emerged between perceiving isolation measures as appropriate and undergoing cancer treatment ($r = -0.324; P = .010$). This suggests that individuals not undergoing cancer treatment were more inclined to view isolation measures as fitting compared to those actively receiving treatment. Secondly, a weak negative correlation was found between changes in work-related situations since the start of the pandemic and age ($r = -0.288; P = .017$), indicating that younger patients experienced more changes in their work circumstances than did older individuals. Additionally, a weak negative correlation was observed between age and perceiving isolation measures as appropriate ($r = -0.293; P = .011$), signifying that younger patients were more prone to perceiving isolation measures as less appropriate than were their older counterparts.

Discussion

The objective of this manuscript is to describe the changes in health-related behavior and social dynamics and analyze the relationships between a number of clinical characteristics and sociodemographic information in Hispanic cancer patients living in Puerto Rico during the government-mandated lockdown that was initiated because of the COVID-19 pandemic. Descriptive analyses indicate that most Hispanic cancer patients living in Puerto Rico experienced health-related changes in their physical activity levels, sedentary behavior, and religious practices. Furthermore, most of the participants used alternative measures to communicate with family members and experienced changes in family dynamics. The alternative communication measures highlight the importance of family dynamics in this study's sample. Hispanics value *D*, a cultural value that underscores the importance of and loyalty to family and of prioritizing family over individual interests (30). This cultural value serves as a protective factor (31), which might explain why most participants maintained close communication with family members. The well-being of a person's family influences that individual's health habits (32); however, the COVID-19 pandemic has altered family dynamics and well-being

Table 3. Frequencies and percentages of Social and Work-Related Changes due to COVID-19 Lockdown measures

Social practice	f (%)		Response (n = 72)
	No	Yes	
Use of alternative methods to maintain communication with family members	10 (14.5%)	59 (85.5%)	Phone call: 47 (78.2%) Video call: 16 (27.2%) Social media: 7 (11.9%) Safety measures: 4 (6.8%) Messaging: 3 (5.1%) Letter: 1 (1.7%) Getting together: 1 (1.7%)
A change in family dynamics	21 (30.4%)	48 (69.6%)	Social distancing and preventative measures: 27 (56.7%) Decrease in communication and increase in separation: 16 (33.6%) More communication/togetherness: 6 (12.6%)
A change in work situation	56 (82.4%)	12 (17.6%)	Job loss: 8 (66.4%) Change within job: 2 (16.6%) Retirement: 1 (8.3%) More work: 1 (8.3%)
Isolation measures were appropriate	3 (4.4%)	65 (95.6%)	—

(33), potentially contributing to some adverse changes in health-related behaviors, as was seen in our sample.

The patients also reported a reduction in the time devoted to practicing their religious beliefs, a finding that aligns with those of various studies observed across diverse religious affiliations, in which studies there were noticeable declines in time spent on religious practices (34,35). Religiosity serves as a fundamental individual and social/cultural component within the Hispanic community (36), and its modification represents a significant shift within the cultural identity of the members of that community. Religion serves as a crucial cultural element, shaping the thoughts, behaviors, and lifestyles of those individuals who are religious. Its influence can be beneficial, steering people towards developing healthy habits and positively impacting their lives (37). Furthermore, taking a syndemic approach and effectively integrating cultural elements and resources within the Hispanic community could potentially result in significant enhancements to wellness and in various health-related domains (38,39).

Our results show decreased levels of physical activity during the lockdown, likely due to strict restrictions on leaving their home (24,29). This aligns with reports from surveyed (19) and breast cancer patients (40) indicating reduced activity levels (40). Similarly, some cancer patients experienced increased sedentary behavior, consistent with prior COVID-19 studies (40). While most patients did not report changes in sleep, those who did experience a decline, comparable with findings detailing increased numbers of sleeping disorders (21).

A small number of patients reported changes in their smoking and drinking habits. These results are inconsistent with those of other studies that indicate increased alcohol consumption (41) and smoking (42). This could be attributed to a given patient's diagnosis; many possibly chose to follow doctors' orders to stop

drinking and smoking, completely, which posed a protective factor among our participants (43). In terms of social practices related to family dynamics, many used alternative ways to maintain communication with family members. This is consistent with another study in which family members were found to have used text, voice, and video calls to communicate during the pandemic (44). According to the results, many of our participants experienced changes in familial interactions and dynamics. Our results are consistent with those of other studies reporting on changes in routine and family dynamics (45).

In our sample, a relationship was established between age and the perceived appropriateness of isolation measures, with younger patients being inclined to consider these measures as being less appropriate. This might be because older individuals tend to show a more favorable attitude toward COVID-19 measures and better compliance with the rules (46). Moreover, younger patients experienced more changes in their job situations, which could have contributed to their opinions regarding the appropriateness of the measures. However, our sample was composed mostly of older adults, who were more affected and experienced greater changes in employment compared to their younger counterparts (47,48). Finally, most of our sample reported experiencing no changes in their work situations. However, 80.6% of the participants reported being unemployed. Of those who reported experiencing changes in their work situations, 66.6% reported losing their jobs, consistent with the literature, which describes widespread job loss and work-related changes, the latter including having to work remotely and having one's position changed. (18).

Our results emphasize the importance of fully understanding how the mandatory lockdown that was implemented during the COVID-19 pandemic affected the clinical and health outcomes of Hispanic cancer patients in Puerto Rico. Additionally, the syndemic framework, which emphasizes the co-occurrence and interaction of multiple epidemics, including COVID-19 and cancer, offers a valuable perspective for analyzing the interplay of these health challenges and their influence on health-related habits and social practices. The observed changes—including the decrease in physical activity levels during the lockdown period, possibly due to stringent restrictions—indicate a potential deterioration in the physical well-being of the participants. Similarly, the reported decline in sleep among certain individuals suggests the adverse effects of the lockdown on the participants' mental health and sleep patterns, necessitating targeted interventions to address potential sleep disturbances. These alterations in lifestyle behaviors may have implications for oncologic treatment outcomes (49).

The syndemic nature of COVID-19 and cancer highlights the complexity of managing cancer care during a pandemic, requiring an approach that considers the interdependencies between infectious diseases and chronic conditions. Furthermore, the notable changes in smoking and drinking habits observed within the sample, which changes were possibly influenced by the protective factor of adhering to doctors' orders following a cancer diagnosis, highlight the significance of healthcare guidance in terms of shaping healthier behaviors during challenging circumstances. Considering these findings, it is imperative to prioritize tailored measures, such as implementing remote healthcare services,

establishing virtual support groups, and providing easy access to mental health resources, to mitigate the detrimental effects of a lockdown (50) on the physical and mental well-being of Hispanic cancer patients in Puerto Rico. By integrating these measures, healthcare providers can offer comprehensive support and resources to alleviate the unique challenges faced by this vulnerable population during any similar crisis situations as may occur.

Study limitations

One limitation encountered was the lack of literature regarding changes in cancer patients' health-related behaviors; this lack made many comparisons with other communities impossible. However, we believe our study contributes essential information concerning health-related behavior changes that occurred during the pandemic in cancer patients in Puerto Rico. To our team's knowledge, there is no published manuscript on this topic. This manuscript provides valuable information on how cancer patients in Puerto Rico managed their health-related behaviors during the worldwide emergency.

Conclusion

The study's findings highlight shifts in the health behaviors and social practices of Hispanic cancer patients during mandated pandemic-related lockdowns. The participants reported decreased physical activity levels, increased sedentary behavior, altered sleep patterns, changes in family dynamics, and shifts in communication strategies. Additionally, for the patients, there was a correlation between not receiving treatment and the tendency to perceive isolation measures as suitable. Younger patients experienced greater alterations in work situations and were less inclined to view isolation measures as appropriate compared to older patients. These results offer valuable insights into the experiences of a vulnerable population, highlighting potential impacts on their daily lives and relationships with sociodemographic and clinical characteristics. Future research could delve into the specific implications of these changes for Puerto Rican and Hispanic cancer patients.

Resumen

Objetivo: El estudio buscó explorar cambios en conductas de salud y prácticas sociales en pacientes hispanos con cáncer durante un cierre gubernamental, relacionándolos con características sociodemográficas y clínicas. **Métodos:** Se realizaron análisis secundarios de un estudio longitudinal de cohortes de casos que buscaba describir las necesidades insatisfechas entre pacientes hispanos con cáncer expuestos al huracán María del 2017, los temblores en el 2020 y el COVID-19. Sin embargo, los datos de este estudio hacen referencia únicamente al periodo de la pandemia de COVID-19. **Resultados:** La mayoría de los participantes eran mujeres (n = 72) con cáncer de mama (81.2%). Se observaron cambios en prácticas religiosas (60%), actividad física (58.4%) y comportamiento sedentario (50%). Un 1.4% cambió hábitos alimenticios y de sueño. Mantener contacto familiar (85.5%) vía llamadas (78.2%) y reportar cambios

familiares (69.6%) fueron respuestas comunes. La mayoría apoyó medidas de aislamiento (95.6%). Pacientes sin tratamiento eran más propensos ($r = -0.324$, $p = 0.010$) a ver apropiado el aislamiento. Los jóvenes experimentaron más cambios laborales ($r = -0.288$, $p = 0.017$) y menos aceptación del aislamiento ($r = -0.293$, $p = 0.011$). Conclusión: Este análisis presenta los cambios en los hábitos de salud y prácticas sociales experimentados por los pacientes con cáncer debido al cierre obligatorio. Estos hallazgos aportan a la comprensión de la experiencia de los pacientes con cáncer durante la pandemia del COVID-19, especialmente entre los hispanos.

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