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ARMED CONFLICTS

Armed Conflicts

In parts of the world where our closest ties to armed conflict are only the death tolls and images we see online, how many of us fully understand the impact on those affected? Hundreds of thousands of migrants have attempted the treacherous journey across the Mediterranean Sea, risking death in hopes of better lives. Médecins Sans Frontières hospitals in Syria and Afghanistan have been demolished by airstrikes and bombings, forcing MSF to pull out of dangerous zones. While politicians worldwide debate the consequences of admitting refugees, international medical aid continues to be targeted and thwarted in war-torn regions, leaving people without aid. How do victims of armed conflicts access necessary healthcare when those dedicated to impartial humanitarian assistance have no choice but to withdraw from the most hazardous regions?

The aftershocks of armed conflicts such as the Syrian civil war and wars in Afghanistan and Iraq will undoubtedly be felt all over the world long after they end. For Volume VI Issue II of The Journal of Global Health, we examine the repercussions of such conflict in the context of healthcare. Flip through the pages of this issue to see how countries with well-established healthcare systems struggle to meet the medical needs of migrants and refugees and how prejudices and politics complicate the already challenging medical response. As students of global health, we should strive to understand the physical, mental and emotional needs of those affected by armed conflicts and to remember that there remain lasting effects even after conflict has ended. This understanding precludes the development of useful and viable solutions such as improving public health infrastructure, addressing mental health issues and implementing policies beneficial for the greater public.

This issue marks The Journal of Global Health's fifth year of leading impactful student global health discussions around the world. We are proud to present our first issue as co-editors-in-chief and the culmination of months of hard work of the JGH board members and authors featured in this issue. There remains much more research to be done and many more stories to be told. The JGH team continues our mission to promote global health dialogue and impactful research in the form of our physical journal, global health podcasts, and regularly updated content on our website, ghjournal.com.

Kristy Choi
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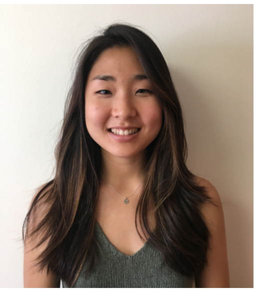
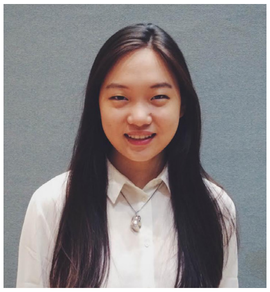
Editors-in-Chief





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Effects of Conflict Zones on Two Western Healthcare Systems: Italy and Israel

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In the last decade, and especially since recent events in the Middle East and ensuing wars, armed and military conflicts have risen to levels not witnessed in the past. Now, in nearly 50 geographic areas, civil wars, sectarian violence, famine, religious persecutions and genocide have caused significant population migration across borders, indirectly impacting medical care in neighboring recipient countries and continents.[1,2,3,4] The United Nations, Council of European Union, and the World Health Organization have treaties, policies and articles addressing and outlining health delivery for migrants and refugees around the world. These policies serve as a legal framework for recipient countries to address this issue as part of their obligation to administer medical care. How these policies are translated into practice and the effects these policies have on healthcare delivery vary from one country to another, from one municipality to another, and from one hospital to another. [5,6] Yet, overall, delivery of care is upheld and in line with the above mentioned policies. This qualitative study addresses how conflicts in North Africa and Syria impact hospitals and refugee sites in Florence, Italy and Nahariyya, Israel. It is based on direct participant observation, literature review and interviews with physicians, nurses and hospital administrators. The paper aims to outline how hospitals in these particular locations apply international laws, such as United Nations High Commission for Refugees (UNHCR), International Covenant on Economic, Social, and Cultural Rights (ICESCR) and UN Resolution 18/2816 and describes the challenges for staff, institutions and organizations providing care for patients affected by conflicts who are unable to access medical care in their native country.

Background

UN treaty provisions addressing migrants faced with health issues are outlined in the International Covenant on Economic, Social, and Cultural Rights (ICESCR) adopted on December 16, 1966. The treaty defines the provision of emergency care as a basic human right and establishes the "right to the highest attainable standard of health."[7] Articles by the Council of Europe addressing the Right to Protection of Health closely mirror the above mentioned Article of UN ICESCR treaty on the right to healthcare for undocumented migrants as well as asylum seekers.[8,9] The UN ICESCR treaty emphasizes that the "member states are under obligations to ensure" basic and fundamental elements such as non-discriminatory provision of health; available, accessible, acceptable and of quality (AAAQ) health services, a set of basic essentials such as medications, maternal and child health care and immunizations, must be provided. [7,9] Navigating an already complex bureaucratic health delivery system, governmental organizations and healthcare delivery systems that absorb refugees are faced with a unique task of applying international laws to treat migrant patients in accordance with the humanitarian treaties of both the United Nations (UN) and the Council of Europe.[7] In most cases providing medical care is a challenge for localities that are not metropolis settings, as small communities on frontiers operate with limited resources on a constrained budget. [6] Each hospital in this study has its unique difficulties and challenges but continues to respect human rights and international laws. This study focuses on Italy and Israel because of both countries' geographic proximity to two conflict zones, North Africa and Syria, that caused astonishing numbers of refugees in the world when this study took place from 2014 through 2015.[2] These two regions were undergoing unseen armed conflicts, as well as ignored humanitarian rights as a consequence of the conflicts, and thus, refugees were forced to seek humane relief elsewhere. According to CNN, 250,000 migrants reached Mediterranean Europe in the first half of 2015.[3] Some landed on the small island of Lampedusa or further in Sicily, Italy. During the same time period, hundreds of Syrians have been treated in Israeli hospitals since 2013 due to the Syrian Civil War. Syrians in need of medical care in hostile regions sought immediate assistance at the armistice line. Hospitals in the area provided humanitarian aid free of charge in line with medical ethics and the mission of Israeli healthcare providers.[10] In response to the consequences of armed conflicts and border proximity, this study focuses on the aid provided by Italy and Israel to refugees seeking care. Prior to the study, emails were sent to Hospital Administrations in Catania and Palermo (Sicily), Reggio Calabria, Rome and Florence (continental Italy). Of the seven hospitals contacted in Italy, St. Giovanni di Dio (a major municipal hospital) and Careggi University Hospital, both located in Florence, responded. Compared to hospitals in smaller regions of Italy, where most North African refugees initially land, these major hospitals have bigger resources, from social workers to translation services to infrastructures, and thus are overall better equipped to absorb large numbers of refugees. Visiting smaller border hospitals would have provided insight into refugee conditions upon landing, however access to these sites was not granted by hospital administrators for undisclosed reasons. In Israel, Western Galilee Hospital, one of the most refugee-populated hospitals in Israel because of its proximity to both the Lebanese and Syrian borders, was chosen as a subject. Assuta Hospital in inland Israel was chosen as a subject as well. While Assuta Hospital does not treat refugees, it focuses on medical tourism, providing a glimpse into an existing framework that accommodates the needs of foreigners such as language, accommodations and follow-ups. In total, two hospitals, Western Galilee Hospital and Assuta Hospital, were the only subjects visited in Israel. No other countries were chosen, as they were either not targeted destinations for migrants at the time of this study (from late 2014 to mid 2015) or unsafe to visit due to surrounding armed conflicts. After granting access to the aforementioned hospitals, St. Giovanni di Dio and Careggi University Hospital preferred direct contact and allowed interviews with physicians and other medical personnel, whereas Western Galilee Hospital and Assuta Hospital allowed both scheduled times to speak and interviewing hospital officials.

Italy

Due to the European Union's (E.U.) geographic proximity to conflict zones and the allure of socioeconomic stability, it is no surprise that most African and Middle Eastern migrants seek refuge in E.U. countries when displaced by famine, civil wars and religious persecution. Migrants often landed on the small southern island of Lampedusa or further in Sicily, Italy, where communities are small and major hospitals are often many miles away. Lampedusa is one of the closest southern coasts of Western Europe located in proximity to the conflict zones of Northern Africa. Most of the initial medical assessment is provided by Non-Governmental Organizations (NGOs) and local churches.

In addition to challenges arising from long, dangerous and arduous journeys, undocumented migrants also face language barriers, cultural barriers and fear of deportation. In many countries, including Italy, where this study partly took place, physicians and hospital staff are prohibited from reporting undocumented migrants to authorities.[7] Hospitals and clinics often address the issues of language and cultural barriers and an inability to co-pay for services at the hospital's own expense. In addition, many hospitals and clinics attempt to provide translation services, training to increase cultural awareness and also provide in-service training on legal and ethical aspects of treatment. Italy already has minimal financial resources for healthcare, sparking debate about the appropriation and allocation of aid to refugees. According to The World Bank Data, Italy spends only 9.1% of GDP on healthcare as compared to other western countries such as France (11.7%), Germany (11.3%) and USA (17.1%).[11] The percentage of GDP spent on a refugee versus a native Italian towards healthcare has yet to be directly calculated. However, according to a Center of Immigration Studies report in 2015, an estimated equivalent of 63,000 US dollars is spent on a refugee for five years in Italy. The percentage of this that is allocated to healthcare is unknown. Therefore, the direct cost of healthcare spent on each refugee is for now too early to estimate.[12]

Germany received 37% of refugees by mid 2015, mainly from Syria, while Italy received 7%, signifying a varied allocation of resources.[13] As European countries have become further divided on the issues of how the EU should share the financial burden of medical care for refugees, inevitable differences exist from one institution to another that stem from resources available to municipalities. In the media, these and other issues, such as cultural compatibility, often become publicly debated and highly politicized.[6] Currently, the gap in delivering care is often filled by Non-Governmental Organizations (NGOs), charitable health care providers (Caritas), church groups, etc. [9] While advocacy for human rights in healthcare is very prominent in the EU and other socialized countries where universal healthcare is viewed as a right rather than a market commodity, the tradition of charity care by hospitals, physicians, and community healthcare centers is less prominent than it is in the U.S. [9] The European social model of universal healthcare requires less charity sector assistance as compared to the current system employed by the U.S.[9] Therefore, in the EU the gap in healthcare provision for non-citizens is harder to fill on short notice and with an unexpected influx of refugees.

The services covered and the funds available for providing medical care under legal conventions adopted by the European Union for undocumented migrants, asylum seekers and refugees are based on fiscal impact, humanitarian/ethical issues and public health issues, which ultimately protect the native citizens of the recipient country and limit access to those eligible who may be faulting the provided resources.[1] While quantitative data specific to Italy is unavailable, figures from similar western countries, such as the United Kingdom (UK), are representative due to policies outlined by the UN and WHO that influence healthcare spending. 8 According to home office figures in the UK, each migrant costs the taxpayer up to £8,350 (approximately US $12,500 in 2014) a year on public services such as healthcare, education and benefits bills.[14]

Israel

Due to a Lebanese civil war conflict in the 1970s and 1980s and an almost 100 mile border that Israel shares with northern Arab States, it was inevitable for Israel to establish a Good Fence Policy in 1978 that aimed to provide humanitarian aid to Lebanese refugees.[15,16] The Good Fence Policy held that while Lebanon was suffering through its civil war in 1978, Israel would allow its own borders to open in order to provide medical assistance and access to Israeli healthcare services and hospitals for Lebanese citizens. The fundamentals of the Good Fence Policy resembled those of Resolution 2816 (XXVI) of December 14, 1971 of the United Nations General Assembly, which establishes the "effective coordination system of humanitarian assistance."[15,16,17]

The Syrian conflict began in 2011 in response to political turmoil and has since displaced countless numbers of refugees fleeing for safety from the armed civil war. In regards to refugees from southern Syria, which borders northern Israel, given decades of conflict between the two enemy states, the logistics of providing healthcare is a delicate balance among medical care, public health, ethics, politics, budget and national security.[18] Syria and Israel share a border with a heavy military presence on each side, complicating access to medical care for Syrian citizens.

As the Civil War in Lebanon ended in 1990, the Good Fence Policy slowly became obsolete by 2000. However, the practice of providing medical assistance to refugees was adapted from the Good Fence Policy and serves as a basic framework that provides humanitarian aid to Syrian citizens who live in southern villages close to the northern border of Israel. While there is no legal protocol, Israel maintains the practice set forth by the Good Fence Policy out of the good will of international relations. Syrian refugees are unable to access quality medical care in Syrian cities due to the ongoing Syrian Civil War. [15,19]

In accordance with international conventions, Israel takes refugees, and at a field hospital in Golan Heights by the armistice line fence, the Israeli military has been treating wounded Syrians who require medical aid. [18] Those with more serious conditions are transferred to hospitals inside Israel. [20] Hundreds of Syrians have been treated in Israeli hospitals since 2013, as they provide humanitarian aid free of charge in line with medical ethics and the mission of Israeli healthcare providers. [10,19,21]

The refugees from various Syrian conflict zones either arrive in Israel seeking medical care voluntarily or are brought in fragile medical conditions. Due to a long history of violence and political disagreements, Syrian refugees are distrustful of the help provided by their enemy state of Israel. Yet, Israel has a very favorable reputation of being on the cutting edge in the medical field and of being well equipped and organized to address disasters and provide humanitarian aid as was portrayed during the earthquakes in both Haiti and Nepal. [22] According to Sara Paperin, international liaison at Western Galilee Hospital and head of development and foreign media at Western Galilee Hospital, as of June 2015, 700 Syrians have been treated in Israeli hospitals since the Syrian Civil War.

Israeli Physicians for Human Rights, an NGO comprised of healthcare professionals and social activists with the goal of achieving a more inclusive society, affirms that Israel is bound by the United Nations High Commission for Refugees (UNHCR) to provide humanitarian aid for those seeking asylum. 19 Humanitarian aid consists of assistance in response to human crises. Its primary objective is to save lives, alleviate suffering and maintain human dignity in accordance with General Assembly Resolution 46/182 and the UN Office for the Coordination of Humanitarian Affairs (OCHA), guaranteeing coordinated efforts in reaction to humanitarian emergencies. [21]

In addition to the international human rights declarations and treaties mentioned above that focus on defining individual rights to health care, medical ethics provide a professional set of codes and duties for health care providers towards their patients. [23] As members of the World Health Organization (WHO), both Italy and Israel are under international obligation to abide by those values. [24,25] Both countries have practices and legal policies to adapt to an influx of migrant populations and to ensure that each individual receives appropriate and equitable care. For Italy, the Straniero temporaneamente presente card (STP) ensures access to medical care and entitles the holder to the same medical care as a native under the national health coverage (see Appendix A), including doctor visits, consultations and medication. Upon arrival to any hospital in Italy, the patient receives a form (Appendix B) that upon completion serves as the STP card. In Israel, the Good Fence Policy remains an informal practice to ensure medical care to migrants out of international good will.

Methods

In order to assess how the UN, WHO and EU policies for the right to protection of health are translated and applied in practice, two countries were sought for this study based on geographic proximity to conflict zones. To represent North African migrants seeking asylum in Italy, hospitals across the country were contacted via email. Two healthcare facilities from Florence responded: St. Giovanni di Dio and Careggi University Hospital. Remaining hospitals failed to respond to email outreach. A geriatrician, two residents and one hospital administrator in charge of the residency program were interviewed at Careggi University Hospital. While at the hospital, the geriatrician offered a visit to two additional sites, one of which was an unauthorized makeshift refugee camp on the outskirts of Florence located in an abandoned department store. The second location was Casa Stenone, a pastoral residence with 12 available patient beds as part of a project of continuity of care hospital-territory for the population not enrolled in the National Health Service. The project was founded in collaboration with the Tuscany Region and the City of Florence, along with the Azienda Sanitaria Locale (ASL) of Florence (a local health agency), the Careggi University Hospital and the Florence Society of Health in collaboration with Caritas of Florence. Casa Stenone provides care for individuals without National Health Service and non-residents, hospitalized and in need of continuity of care once discharged. At this location, a volunteer physician and one patient were interviewed. Due to limited resources, language barriers and unwillingness of migrants to discuss their status, no other patients were interviewed.

To represent Syrians affected by civil war, Western Galilee Hospital, a major teaching medical institution in northern Israel located on the southern border of Lebanon and the largest near the Syrian border was chosen for this study. As a result of its geographic location and literature review, one can assume that this hospital would receive many patients directly affected by conflict and seeking medical care as outlined and adapted from the pre-existing Good Fence Policy.[10,18] Another site for this study was Assuta Hospital in Tel Aviv. This particular hospital was chosen due to its intensive advertisement of medical tourism on its website. As opposed to refugees seeking medical treatment, those seeking care as medical tourists are often opting for elective procedures in hospitals or countries where the care may be of higher quality or lower cost. Thus, the hospital serves as an appropriate template for dealing with foreign nationals, as it is skilled at addressing language and cultural barriers. In dealing with patients seeking elective care from various parts of the world, the experiential training of these physicians equips them with the expertise to navigate language and cultural barriers and in doing so serves as a platform for other hospitals to deal with foreign patients.

In order to be granted access to these facilities, extensive email correspondence explaining the purpose of this study was exchanged. In addition, all locations required proof of identification such as passport, student I.D., proof of enrollment in university, proof of immunization against communicable disease and an application through the hospital departments as a clinical observer. All together three weeks were spent among various hospitals: one week in Florence, Italy, 12 days in Nahariyya, Northern Israel and two days in Tel Aviv, Israel, based on access granted by the individual facilities.

To assess how the aforementioned policies are applied and translated from theoretical to practical, an employee-friendly "7 Category Question Tool" was independently developed. While this question tool was not tested before the study, as testing would have involved a considerate sample not attainable due to constraints of access to hospital staff, it accurately reflects and mirrors the UN ICESCR treaty of 1966. While some questions are specific to the EU and others to Israel, basic questions focused around access, acceptability and quality of healthcare (Appendix C). The interview tool was used with both healthcare providers and administrators to obtain a broad perspective. Patients in hospitals were not interviewed based on the content of the "7 Category Question Tool." The answers provided by nurses, physicians and hospital administrators paralleled similar themes of treaty provisions being upheld.

In order to understand the challenges countries and institutions face when there is a sudden influx of a foreign population in need of humanitarian health care, it is important to understand the myriad of dimensions from fiscal to sanitary structure, budget to resources, historical background to logistics and cultural differences.

Study Site Description

Italy

Italian healthcare is a National Health Service (Servizio Sanitario Nazionale—SSN), encompassing free access to care for all and funded by the government and tax payers. However, some form of a co-pay equivalent to $35-50 exists and is typically paid in non-urgent cases, according to the triage nurse at San Giovanni di Dio. Italian healthcare was 9.0% of Italy's GDP in 2006 and was overall regarded, by WHO rankings, as the 2nd best in the world in 2000.[26] As per Bloomberg's healthcare efficiency ranking, Italy was third most efficient healthcare in 2014.[27]

Overall, the day-to-day structure and operation of hospitals is similar to those in other western countries. When care is needed, patients gain access to institutions via emergency rooms, in-patient services, or out-patient clinics. In Italy, the traditional family does not appear to require much social-work intervention and is visibly homogeneous. Most of the clinicians speak only Italian, and as compared to the U.S. multicultural society, it is harder to find multilingual employees, such as those that speak English, which would be of great assistance to refugees. According to Baraldi and Gavioli, interpretation services are poor in Italy in both small and large cities.[28] Medical tourism, as compared to other EU countries, like Germany, is not popular and, according to Dr. Giuseppe Spatoliatore, a nephrologist at St. Giovanni di Dio in Florence, services such as translation and diversity sensitivity training workshops have traditionally been excluded from the medical training landscape.[29] Diversity training, specifically for hospitals, deals with educating professional staff on appropriate measures to take with patients of varying backgrounds. By teaching skills such as understanding of how different cultures express pain verbally and through gestures, such training helps to overcome language as well as cultural barriers.

NGOs, specifically one called MEDU (Medici per i Dritti Umani – Doctors for Human Rights), observe the efficacy of their efforts when dealing with issues of disparity of healthcare to refugees. This organization attends refugee sites, such as those previously mentioned, and connects migrants with medical resources such as treatment plans and temporary medication supplies. These organizations attempt to fill the existing gap of access to medical care.[30,31]

Israel

Western Galilee Hospital, Nahariyya's primary hospital, is located a little over six miles from the Israel-Lebanese border and is one of the best-equipped hospitals in proximity to the Israel-Syrian border in terms of technological resources. As such, it follows protocols as outlined in the Good Fence Policy that was founded with the goal of providing humanitarian aid to Lebanese refugees and serves as a framework to provide aid to those seeking care in Israel from Syria in the aftermath of a civil war that started almost five years ago.[15,16]

In expressing support of his hospital's efforts to provide this aid, the general director of Western Galilee Hospital, Dr. Massad Barhoum stated, "Every patient that comes through the hospital doors is first and foremost a person in need of lifesaving medical care. In the eyes of our staff, treating Syrians is a moral obligation, as well as a professional and humane honor."[32]

In order to sustain the provided aid, some financial funding for the treatment of refugees is provided by community organizations, specifically local mosques, as noted by a nurse in the ophthalmology department of Western Galilee hospital. Many provide monetary assistance for the cost of medication and prosthetics or collect community donations for items such as wheelchairs. Ultimately, most of the expenses are covered by the State of Israel and tax payers.

Discussion

Italy

Using participant observation and following the "7 Category Question Tool" (see Appendix C) to interview doctors at St. Giovanni di Dio and Careggi University Hospital, and a resident who also volunteers with MEDU at refugee camps, revealed that foreigners arriving in Italy, who seek medical treatment vary in multiple ways, such as proficiency in language, complexity of medical illness, and knowledge of the Italian healthcare system.

Regardless of the challenges and lack of infrastructure that deals with a sudden influx of foreign patients, basic international laws and human rights are preserved and align with medical ethics. Foreigners are eligible to receive medical care by completing a form that includes two sections: one for those with SSN coverage for documented migrants, either EU citizens or those legally in Italy (Appendix B), and another for undocumented migrants. The latter is provided by obtaining an Straniero temporaneamente presente (STP) card. Those completing the latter are entitled to receiving free care granted by STP. This card entitles the holder to a variety of healthcare treatments including access to hospital visits, long-term care such as dialysis and chemotherapy, and medication for at least six months, at which point the holder may renew the card for another six-month period.[32,33] STP access is traditionally granted to those staying temporarily in Italy, but require necessary medical attention in the near future.

The collaboration between the Tuscany Region and the City of Florence, along with the Azienda Sanitaria Locale (ASL) of Florence (a regional healthcare agency), the Careggi University Hospital, and the Society of Health Florence in collaboration with Caritas of Florence, provides care for individuals without National Health Service and non-residents, hospitalized and in need of continuity of care once discharged. Continuity of care is guaranteed by a "multi-professional team that prepares a personalized care plan identifying paths of adequate health and social care, to reduce the costs arising from inappropriate admissions."[34] The service is directed towards patients admitted to the hospital and discharged, but with an urgent need for continuity of care including: undocumented Italian citizens, non-resident or domiciled, or homeless, who may not have health registration, non-EU citizens equipped with the STP card (Appendix A) entitling temporary migrants access to medical care and EU citizens equipped with STP.

Another route popular among refugees is to obtain medical care from NGOs that visit the refugee camps. This approach is favored by those who prefer to keep their location a secret from the Italian government. This secrecy is due to the fact that many refugees seeking asylum in Italy do not intend for Italy to be their final destination. An undocumented Somalian migrant encountered at the refugee camp in Florence arrived in Italy three weeks earlier but expressed plans to move to Norway very shortly because "the living and working conditions there are much more favorable." The Dublin Regulation aims to determine the member state responsible for an asylum claim and prevents a single asylum seeker from applying for refugee status in more than one European Union state.[35] Therefore, when asked why the refugee did not apply for STP, the answer consisted of avoiding registering with the Italian Authority, a country not intended as his final destination. In contrast, another location visited, Casa Stenone, houses transient patients requiring continuity of care, many of whom partake in the STP program and are in Italy with the knowledge of the Italian government.

In either case, migrants receive the same medical treatment as EU citizens, including access to a general practitioner and long-term critical medical care, such as dialysis and chemotherapy. In some cases of migrants requiring continued medical care, the assistance of a social worker is needed to help secure services from housing to stipends, which are financed by the Italian government.[36,37]

In Florence, Tuscany, while diversity training is not yet part of a medical school curriculum, some extracurricular activity and collaboration exists within the Department of Social Services to address these aspects. During an interview with Dr. Giuseppe Spatoliatore, he explained that Ethnic Cultural Mediators (Mediatori Culturali Etnici - MCE) are state employees and can be contacted via phone to provide translational services. In addition, these individuals can come to the hospital and be at the disposition of the healthcare providers to assist with language and/or cultural aspects of care, states Dr. Spatoliatore. These initiatives exist only in major cities of Italy and the infrastructure to absorb an influx of foreigners with cultural incompatibility is not widely available to accommodate the extensive influx of migrants.

In general, bureaucracy is an issue, and many Italian citizens wait weeks and months for out-patient appointments. Displaced migrants often come without the prospects or means of obtaining a private Primary Care Provider. Dr. Spatoliatore also commented that the addition of migrants seeking medical care granted by an STP card further saturates an already burdened system forcing some native Italians to seek other treatment alternatives and opt for the "free market" option, provided by private clinics, which is paid completely out-of-pocket.[33]

Israel

The Healthcare System in Israel is similar to other socialist countries in that it provides universal coverage.[38] In the last four decades, Israel has witnessed immigration from other countries, mainly from Eastern Europe and some Arab states.[39] As such, it is easy to find employees and medical providers who speak at least one other language in addition to Hebrew with English being most common. On one occasion, while the author was observing ophthalmologist Dr. Ron Chanany at Western Galilee Hospital, out of 13 patients examined, eight preferred to dialogue in Russian, three in Arabic and two in Hebrew, signifying the multilingual patient population that exists in Israel, making issues of cultural compatibility more important to deal with in Israeli hospitals.

According to Ms. Paperin, refugees are brought from the borders of neighboring conflict areas by military transport. Military field hospitals located along the Israeli border primarily receive patients at odd hours of the night, attempting to perform secret emergency care without the knowledge of their native country for fear of being accused of political treason or risking repercussions. When it comes to refugees from Syria, given decades of conflict between the two enemy states, the logistics of providing health care is a delicate balance of ethics, border control and a dedication to providing humanitarian aid. Little is revealed about how Syrian patients arrive in Israeli hospitals, other than the fact that the Israeli military runs the technical side of the operation. This secrecy is due to the fact that injured patients, upon reaching the armistice fence line, are the responsibility of the State of Israel and must be handled delicately by the Israeli Defense Forces in order to protect the identities of the Syrian patients. One conclusion that could be made from these parameters is that when injured patients make it across the border, they are seen at a military medic unit on the armistice fence line. If additional care is required, they are transported via military jeep and soldiers to the nearest hospital. Upon discharge, the hospital calls the army to transport the patients back to the border of their native country. The identity of these patients is closely guarded in order to protect them from possible threats and prying journalists upon return to their home countries.[20] After treatment, a copy of the hospitalization history and a supply of medications are given, and patients are returned to their home countries, hopefully with as much secrecy as they arrived to Israel.

Focusing on the care provided to non-citizens, from an enemy territory and applying the "7 Category Question Tool" by interacting with staff at the Western Galilee Hospital, this study reveals that there are hospitals that indeed uphold international laws concerning humanitarian aid. This is, however, very challenging due to issues concerning refugees from enemy countries, the financial impact they have, and medical ethics. Furthermore, a poor baseline medical condition, returning back across the border prior to completion of treatment, or failure to follow-up provide additional challenges.

Patients were not interviewed due to language barriers and patient confidentiality medical laws. However, interactions with nurses, physicians, and hospital administrators produced some insight about the conditions Syrian refugees most commonly present. Some suffer from extreme battle wounds and fragile medical health neglected due to lack of access in their native country. This is compounded by the often poor medical treatment they receive prior to arrival. In addition, the lack of past medical history further complicates medical treatment for the healthcare provider.

Some patients are either severely injured or in poor health, and many are unable to make informed decisions concerning whether or not to accept treatment in Israel. In an interview with Ms. Paperin, officials recognize that patients are not "enemies of Israel" simply because they refuse to accept Israel as a state. Syrian propaganda unfavorably depicts Israel and its citizens, which in turn hinders Syrian patients' abilities to make informed medical decisions in the context of the healthcare Israel can provide.[20,22,32] In some cases, patients would have refused care if not for the critical and urgent nature of their wounds. Patients arriving in Israel from Syria are rarely within the Israeli border by choice and often fear persecution from their native country. For this reason, Ms. Paperin explained, many patients refuse continued medical care and, against the recommendations of Israeli doctors, return to their home country before treatment is complete. In the particularly fragile condition of these refugee patients, continued care and frequent follow-ups are often ignored necessities. Ms. Paperin further noted that Syria has an extensive and unregulated black-market for antibiotics and other medicaftions, which can lead to resistance, adverse interactions, and incompatibility with medications available in Israel.

Ms. Paperin recounted a story of a pregnant Syrian woman who was shot in the head and rushed to Western Galilee Hospital. While the woman was in a coma, her baby was safely delivered, though nearly two months premature, via cesarean section and was being closely monitored in an incubator. When the woman awoke and realized she was in Israel, she demanded to be released with her baby immediately. When the physicians warned her about the dangers this posed for both her and her baby, she answered that she would rather have died trying to return home to Syria and deliver her child there than bring an Israeli-born baby back into her home country.

Conclusion

As portrayed in the media, access to medical care for refugees and migrants is a very relevant topic that should be openly discussed. The main results of this qualitative study reveal that regardless of language barriers, cultural differences, inability to afford medical care and even absence of diplomatic relations, refugees in need of medical attention were provided care, and UN, EU and WHO policies are upheld. This was determined through interviews with nurses, physicians and hospital administrators.

One limitation of this study is the focus on two western, developed countries, Italy and Israel. While these sites were chosen strategically as outlined above, inconsistencies may have arose from such a narrow concentration. For example, both Italy and Israel are considered western countries equipped with modern technologies. Therefore, the finding that international policies were upheld in both countries may not hold true for less developed countries, leading to more migration to areas with favorable welfare benefits. To address this limitation, further research could concentrate on the comparison in the appropriation of health care to migrants seeking aid in developed and less-developed countries. Another limitation of this study is its qualitative nature. All interviews with physicians, nurses and hospital administrators provided narratives that served to build upon a literature review. Had quantitative data been available, statistics may have supported the literature. That being said, a qualitative study focusing on the small-scale serves as an appropriate pilot project to be built upon in the future. Finally, as no patients were interacted with due to language barriers and patient confidentiality medical laws, this may have impacted results by limiting insight to the provider's point of view. As an implication for further research, the future investigator would have to gain approval in accordance with Institutional Review Board regulation as well as with patients allowing for their inputs to be included.

> "The main results of this qualitative study reveal that regardless of language barriers, cultural differences, inability to afford medical care and even absence of diplomatic relations, refugees in need of medical attention were provided care and UN, EU and WHO policies are upheld."

Many physicians in Italy agree with the theory of universal healthcare, even for those temporarily staying in Italy, but do not believe that the policy is economically or sociologically sustainable. With the introduction of an increasing migrant population in Italy, barriers to medical care will continue to grow and force native citizens who can afford it to seek privatized healthcare. It may be perceived that there is a significant incompatibility, based on socioeconomic differences, with a mixed migrant population in a very homogeneous, educated culture.

However politicized the issue of illegal and undocumented migration is, the medical community obeys international laws and in doing so treats patients based on medical ethics and adapts to the needs of migrants by providing temporary health care insurance and supplying translation services when and where possible. These factors may have caused the recent paradigm shift to enlist a previously absent sensitivity to cultural diversity. Although the majority of the finances are provided by the government of Italy as a result of a tax-based National Health Service that grants universal coverage, at a uniform level of care, throughout the country, some gaps are filled by NGOs such as Caritas, voluntary physicians, nurses, and activists.[9] One strength of Italy's performance in treating migrants is the multiple avenues through which Italy provides medical aid in conjunction with international policies. For temporary residents, they can apply for an STP card, mentioned above, granting them access to medical care and medication supplies for six months. However, a weakness of the country's performance is the relative inexperience with treating migrants. Italy is a very homogeneous population, which complicates the navigation around language barriers and cultural differences. To overcome this, Italy could potentially introduce cultural sensitivity training within their hospitals to lessen the burden.

As opposed to Italy's homogeneous society, the cultural diversity of Israel from Jewish immigration, medical tourism, decades of armed conflict with neighboring countries and the Good Fence Policy helps to prepare Israel to absorb the influx of migrant patients. Although the patients are from various enemy territories, which creates financial burden and issues of national security, the basic international laws with regards to human rights and medical ethics are preserved and carried out under the watchful eye of the government (and logistically by the Israeli Defense Forces), Physicians for Human Rights, and hospital administration. The common sentiment of physicians encountered at Western Galilee Hospital is expressed frustration that they are not able to properly care for many of the refugees as some return before the safe conclusion of their medical treatment, or simply are unable to return for follow-up visits. The humanitarian efforts of these physicians are often complicated by a politically charged atmosphere, which many healthcare professionals feel should not exist within the walls of a hospital.

Despite the assistance of local governments, charity and communities in both locations, it is imperative that the funding and delivery of humanitarian aid is a global effort, which will make large-scale healthcare appropriation faster, more responsive, and more effective.[30] Although the healthcare system that exists in EU countries such as Italy is a national health service nearly entirely funded by the government (and taxpayers), local charities still play a role in funding especially as it relates to care for migrants. Nevertheless, partnerships between the public and private sector exist also in EU countries. NGOs step in and alleviate some of the pressure from hospitals and facilitate patient access to healthcare that they may otherwise avoid due to language barriers, inadequate understandings of their rights or risks involved such as deportation or repercussions. NGOs do not operate independently.[40] During the past decade the humanitarian community has implemented a number of initiatives to improve accountability, quality and performance. Some of the most widely known initiatives are the Active Learning Network for Accountability and Performance in Humanitarian Action and the Humanitarian Accountability Partnership.[40] Representatives of these initiatives meet on a regular basis in order to share common issues.

Overall, healthcare providers remain true to their professional Code of Ethics and Hippocrates Oath to render care to all regardless their origins or beliefs. Personal bias is discouraged and superseded by International and local government laws. However, the sudden and the overwhelming number of refugees creates a financial burden on healthcare infrastructure and forces creating services that were not previously provided such as translation services, an expansion of outpatient clinics, creation of additional NGOs, etc. The platform to assist with such endeavors may be provided by United Nations OCHA that coordinates the international humanitarian response to a crisis or emergency pursuant to Resolution 46/182 of the UN General Assembly.[21,41]

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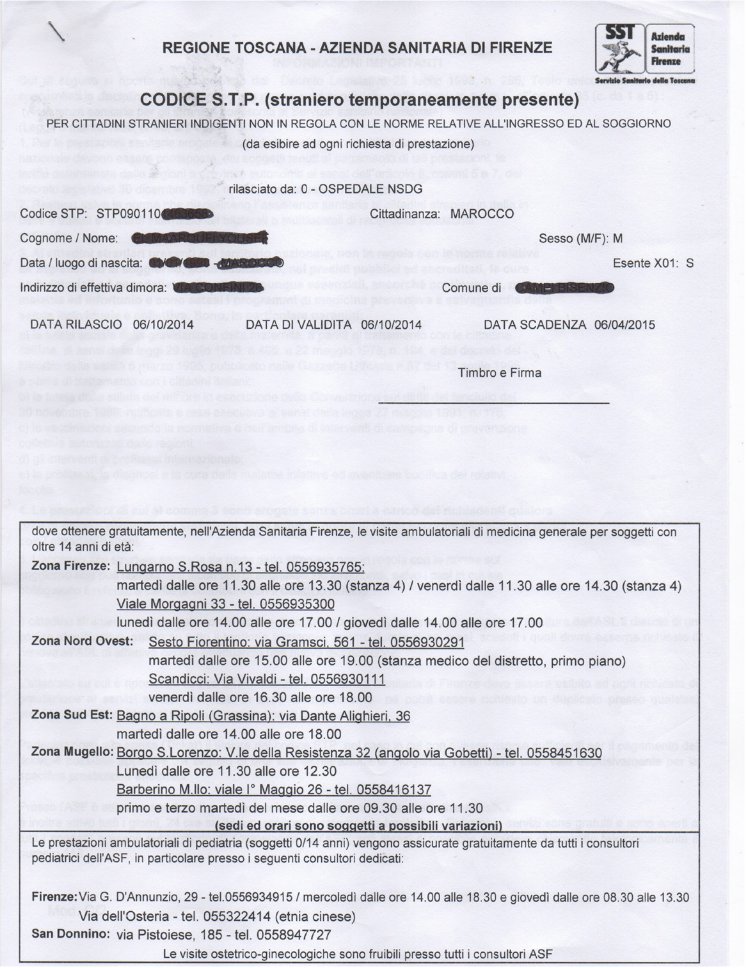


REGIONE TOSCANA - AZIENDA SANITARIA DI FIRENZE

SST Azienda Sanitaria Firenze
Servizio Sanitario della Toscana

CODICE S.T.P. (straniero temporaneamente presente)

PER CITTADINI STRANIERI INDIGENTI NON IN REGOLA CON LE NORME RELATIVE ALL'INGRESSO ED AL SOGGIORNO

(da esibire ad ogni richiesta di prestazione)

rilasciato da: 0 - OSPEDALE NSDG

Codice STP: STP090110[redacted] Cittadinanza: MAROCCO
Cognome / Nome: [redacted] Sesso (M/F): M
Data / luogo di nascita: [redacted] Esente X01: S
Indirizzo di effettiva dimora: [redacted] Comune di [redacted]

DATA RILASCIO 06/10/2014 DATA DI VALIDITA 06/10/2014 DATA SCADENZA 06/04/2015

Timbro e Firma

dove ottenere gratuitamente, nell'Azienda Sanitaria Firenze, le visite ambulatoriali di medicina generale per soggetti con oltre 14 anni di età:

Zona Firenze: Lungarno S.Rosa n.13 - tel. 0556935765:
martedì dalle ore 11.30 alle ore 13.30 (stanza 4) / venerdì dalle 11.30 alle ore 14.30 (stanza 4)
Viale Morgagni 33 - tel. 0556935300
lunedì dalle ore 14.00 alle ore 17.00 / giovedì dalle 14.00 alle ore 17.00

Zona Nord Ovest: Sesto Fiorentino: via Gramsci, 561 - tel. 0556930291
martedì dalle ore 15.00 alle ore 19.00 (stanza medico del distretto, primo piano)
Scandicci: Via Vivaldi - tel. 0556930111
venerdì dalle ore 16.30 alle ore 18.00

Zona Sud Est: Bagno a Ripoli (Grassina): via Dante Alighieri, 36
martedì dalle ore 14.00 alle ore 18.00

Zona Mugello: Borgo S.Lorenzo: V.le della Resistenza 32 (angolo via Gobetti) - tel. 0558451630
Lunedì dalle ore 11.30 alle ore 12.30
Barberino M.llo: viale I° Maggio 26 - tel. 0558416137
primo e terzo martedì del mese dalle ore 09.30 alle ore 11.30

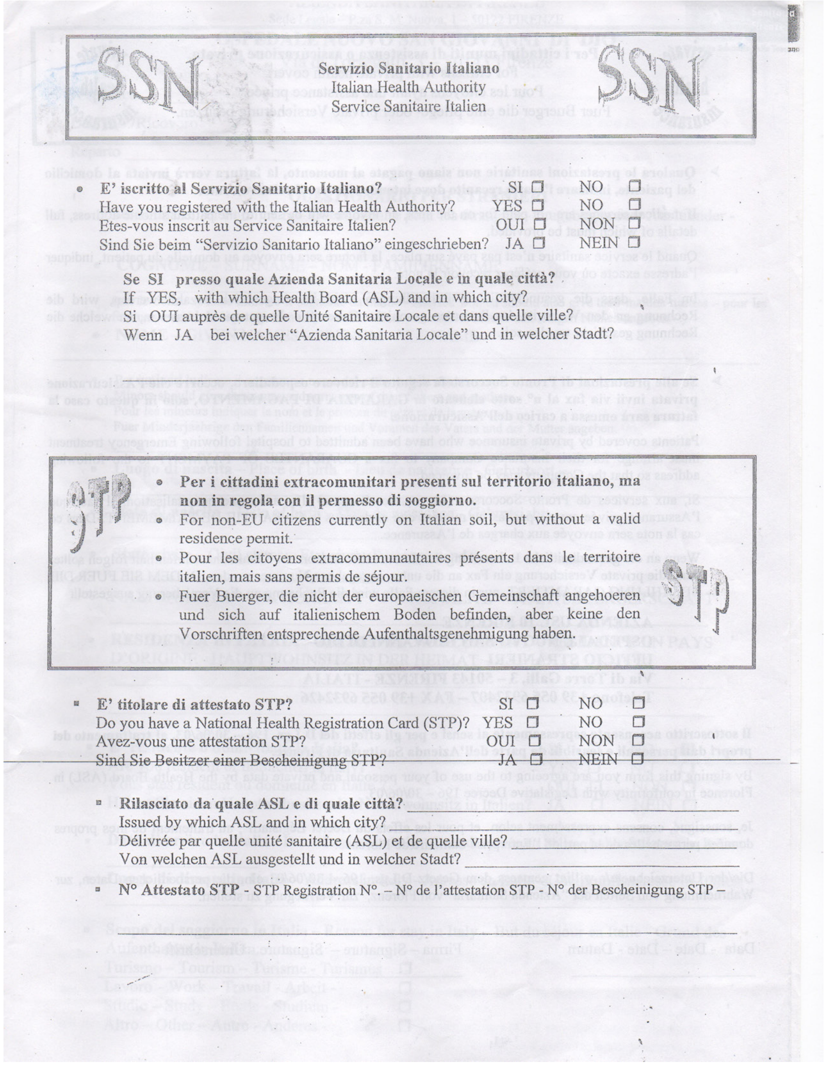
(sedi ed orari sono soggetti a possibili variazioni)

Le prestazioni ambulatoriali di pediatria (soggetti 0/14 anni) vengono assicurate gratuitamente da tutti i consultori pediatrici dell'ASF, in particolare presso i seguenti consultori dedicati:

Firenze: Via G. D'Annunzio, 29 - tel.0556934915 / mercoledì dalle ore 14.00 alle 18.30 e giovedì dalle ore 08.30 alle 13.30
Via dell'Osteria - tel. 055322414 (etnia cinese)
San Donnino: via Pistoiese, 185 - tel. 0558947727

Le visite ostetrico-ginecologiche sono fruibili presso tutti i consultori ASF

Appendix A: STP Card
This card entitles the holder to a variety of healthcare treatments including doctor visits, consultations, and medication for at least six months, at which point the holder may renew the card for another six-month period.



SSN Servizio Sanitario Italiano
Italian Health Authority
Service Sanitaire Italien SSN

- **E' iscritto al Servizio Sanitario Italiano?** SI ☐ NO ☐
  Have you registered with the Italian Health Authority? YES ☐ NO ☐
  Etes-vous inscrit au Service Sanitaire Italien? OUI ☐ NON ☐
  Sind Sie beim "Servizio Sanitario Italiano" eingeschrieben? JA ☐ NEIN ☐

Se SI presso quale Azienda Sanitaria Locale e in quale città?
If YES, with which Health Board (ASL) and in which city?
Si OUI auprès de quelle Unité Sanitaire Locale et dans quelle ville?
Wenn JA bei welcher "Azienda Sanitaria Locale" und in welcher Stadt?

STP

- **Per i cittadini extracomunitari presenti sul territorio italiano, ma non in regola con il permesso di soggiorno.**
- For non-EU citizens currently on Italian soil, but without a valid residence permit.
- Pour les citoyens extracommunautaires présents dans le territoire italien, mais sans permis de séjour.
- Fuer Buerger, die nicht der europaeischen Gemeinschaft angehoeren und sich auf italienischem Boden befinden, aber keine den Vorschriften entsprechende Aufenthaltsgenehmigung haben.

STP

- **E' titolare di attestato STP?** SI ☐ NO ☐
  Do you have a National Health Registration Card (STP)? YES ☐ NO ☐
  Avez-vous une attestation STP? OUI ☐ NON ☐
  Sind Sie Besitzer einer Bescheinigung STP? JA ☐ NEIN ☐

- **Rilasciato da quale ASL e di quale città?** ____________
  Issued by which ASL and in which city? ____________
  Délivrée par quelle unité sanitaire (ASL) et de quelle ville? ____________
  Von welchen ASL ausgestellt und in welcher Stadt? ____________

- **N° Attestato STP** - STP Registration N°. – N° de l'attestation STP - N° der Bescheinigung STP –

Appendix B: SSN form filled out by visitors to the Emergency Room
Provides medical coverage for documented migrants, either E.U. citizens or those legally in Italy.

1. Who sponsors HealthCare Coverage (Access)	• Is it through Universal HealthCare access • Does it cover Emergency only or also referrals • If / when Undocumented Migrant is discharged, assuming s/he has no money to purchase medications, does the hospital pharmacy supplies those medications • Is it in EU interest to provide medical care and prevent transmission of communicable diseases (TB, Hepatitis, HIV, STD, Vaccinations) • Do hospitals ask for co-pay
2. Is the HealthCare Coverage Different for Different groups	• Legal aliens (they work, pay taxes) • Illegal Aliens (undocumented migratory) • Coverage it offers (only emergencies vs limited coverage) • Does coverage vary from one town to another or one country from another (UK and Scandinavian countries vs Italy)due to resources available
3. Interpretation Services in the Hospital (Access/ Acceptability)	• How is the communication between MD / RN and patient takes place, i.e. who translates • Do you witness secondary gain pretending sickness to avoid deportation
4. Are there Cultural Diversity trainings (Acceptability)	• How cultural barriers are overcome • Are there conflicts among healthcare providers in delivering care that stems from their values
5. Is there a discriminatory attitude among healthcare workers (Acceptability)	• If local agencies are unable to deliver the UN, WHO and Council of Europe mandate, is it at odds with Medical Ethics, Public Health, Politics, National and International Laws
6. What happens when patient is discharged (Quality)	• When the patient is a minor, an adult family member is generally allowed to stay with them in the hospital (Israel). • Are there Social Workers to help with TIC (Transition in Care)
7. Does Quality of care varies (Quality)	• Do refugees/asylum seekers get same care as citizens of recipient country •Is there follow-up care delayed (late appointment to out-patient clinic) •How providers deal with personal bias

Appendix C: 7 Category Question tool to determine if Access to healthcare and Quality are met as dictated by international laws.

A Survey of Dietary Habits in Children Younger than Four in Informal settlements in Nairobi, Kenya

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Currently 195 million children under five years of age are affected by malnutrition globally; 90% of these children live in South Asia and sub-Saharan Africa. Additionally, malnutrition contributes to more than one-third of all childhood deaths in children under five years of age globally. There is limited data addressing the effect poor nutrition could have on growth and stature of children under five years of age living in informal settlements in Nairobi, Kenya. The purpose of this pilot study is to describe the differences in nutritional habits of children under four years of age living in informal settlements in Nairobi, Kenya, and determine if there is a relationship to their growth and development.

This survey was conducted between April 28 and May 5, 2014, in the Baba Dogo and Korogocho districts of Nairobi, Kenya, which are communities characterized by low-income and minimal resources. All children less than four years old presenting to the medical clinics, organized by Ross University School of Medicine were evaluated. Using a standard procedure, height and head circumference were recorded as well as caregiver's responses to questions regarding feeding practices.

69 children participated in this survey. The majority were male (57%), the median age of the participants was 18 months, the median height was 77cm, and the median age-adjusted height percentile was 10%. 76.6% of females and 74.3% of males were categorized in less than the 50th percentile of height. These children tended to be older, were weaned at an average older age, but were breastfed at about the same age compared to the average age.

Children living in the informal settlements of Baba Dogo and Korogocho districts were more likely to fall below the 50th percentile for height. No conclusions could be made about how protein intake and breastfeeding habits affected height, however the high numbers of children falling below the 50% percentile could suggest that living and environmental conditions as well as malnutrition could play a role in a child's growth and development. Confronting malnutrition in the informal settlements should be a focus of government programs for nutritional assistance and supplementation.

Introduction

Malnutrition is a medical condition characterized by a deficiency of energy, essential proteins, fats, vitamins and minerals in a diet. Malnutrition in low and middle income countries has been and continues to be a major public health problem affecting millions of children worldwide contributing to more than one-third of all deaths in children under age five globally.[1,2] There are currently 195 million children under five years of age affected by malnutrition, of whom 90% live in South Asia and sub-Saharan Africa.[2]

Sub-Saharan Africa has the highest mortality rate for children under five years of age, of 92 deaths per 1,000 live births. Although Sub-Saharan Africa has seen a continuous decline in the mortality rate for children under five years of age, the region still has a mortality rate of 7 deaths per 1,000 live births, more than 15 times the average for high income countries.[3] It is estimated that by 2050, close to 40% of all births globally will take place in sub-Saharan Africa, and 37% of children under five years of age will live in this region. As a result, the observed decrease in deaths in under-five children could stagnate or even increase without more progress in the region.[3]

To address child mortality rates The United Nations World Summit for Children composed of 71 heads of State and Government and 88 other senior delegates met at the United Nations in 1990 and established 27 specific goals related to children's survival, nutrition, health, education, and protection. Additionally, they aimed to decrease child mortality to less than 70 deaths per 1000 livebirths.[3] While this goal was difficult to achieve in the 1990s, the number of children under five years old dying worldwide declined from 12.7 million in 1990 to 6.3 million in 2013, translating to approximately 17,000 fewer children dying each day in 2013 compared to 1990;[3] Nevertheless, thousands of under-five children today, still die daily due to a lack of proper nutrition.

Proper nutrition is essential in the early phases of infant growth and development. To ensure proper nutrition during this time period, infants zero to six months of age should ingest 60g/day of carbohydrates, 9.1g/day of protein and 31g/day of fat as well as a variety of Vitamins including: Vitamin A, B12, C, D, E, K, Folate, Calcium and Iron.[4] Infants 7-12 months old should ingest 95g/day of carbohydrates 11g/day of protein and 30g/day of fat as well as vitamins A, B12, C, D, E, K, Folate, Calcium and Iron.[4] Without these essential dietary components in the first 1000 days of an infant's life, which are characterized by important phases of brain growth and development, various adverse health outcomes can occur.[4,5]

Nutritional requirements are important not only for growth of the brain, but also for stature. When determining nutritional requirements in a child, it is important to determine their net nutrition. Net nutrition is the difference between food intake and losses to both activity and disease——most obviously diarrheal disease, although fevers or respiratory infections also carry a nutritive tax. The most important nutrients in childhood that affect final adult height are protein, calcium and vitamins A and D.[8] Empirical evidence suggests that race and ethnicity do not affect the distribution of healthy height

Table 1. Descriptive Statistics for Children Less than Four Classified as in the Greater than or Equal to the 50th Height Percentile and Less than the 50th Percentile in Baba Dogo and Korogocho Clinics, Nairobi, Kenya 28 April 2014 to 5 May 2014

	Median(IQR)		**Mean(SE)**		
	≥ 50%	**<50%**	**≥ 50%**	**<50%**	***P* value***
Female†	7(41)	23(44)			1.000
Male†	10(59)	29(56)			
Age‡	12(11)	19(19)	16(3.36)	20(1.65)	.1567
Breast Fed†	6(35)	13(25)			.6086
Age of weaning breast milk‡	6(0.75)	6(0)	5.9(.67)	6.2(0.25)	.6114
Age Fully Stopped Breast Feeding‡	18(15.75)	19(12)	20.3(6.17)	19.3(1.48)	.9174
Receives protein (Yes/No) †	7(41)	16(31)			.6214

*-Chi-square test for categorical variables and Wilcoxon Two-sample (Mann-Whitney U) Test for continuous variables
†-Frequency and percentage
‡-months

for the first five years of life, and any variation between populations or ethnic groups below five years of age could result from various factors other than genetic predisposition.[6–8] Consequently, adult height has been interpreted by some studies to be an indicator of both economics of and the amount of disease present in the child's environment.[9] Early linear growth retardation can lead to reduced economic productivity in adulthood, unfavorable maternal reproductive outcomes and increased risk of development of non-communicable diseases.[10,11]

Stunted growth is largely multifactorial and influenced by the context in which a child is born.[12] Stewart et al mentioned that stunted growth and development are manifestations of malnutrition with long and short-term consequences and are attributable to a combination of household and family factors, inadequate complementary feeding, inadequate breastfeeding practices, and infection.[12,13] Complementary feeding for infants refers to the timely introduction of safe and nutritionally rich foods in addition to breast-feeding at about six months of age and is typically provided from six to 23 months of age.[14] Stunted growth is also a result of the political economy, the health and health care system, education, society and culture, agriculture and food systems, water and sanitation and the environment.[5]

Growth differences can also vary as a function of gender.[15] At birth, the skeletal maturation of females is four to six weeks more advanced than that of males—this discrepancy continues throughout childhood and adolescence.[15] Female growth velocity is slightly slower in birth compared to males, becoming equal to that of males at around seven months of age. From seven months of age to four years, female growth velocity becomes slightly faster than that of males.[15] At four years of age, children of both sexes grow at approximately the same rate until the adolescent growth spurt.[16,17] Black infants tend to be smaller at birth but experience an acceleration of linear growth resulting in a greater height than white children during the first few years of life.[15]

There is limited research regarding infant and childhood growth rates and whether there is a difference in these rates between males and females living in informal settlements of Kenya. It has been recognized that nationally, Kenya houses 35% of under-five children who are stunted, 16% who are underweight and 7% who are wasted.18 The prevalence of malnutrition is particularly high in urban slums, or informal settlements, where stunting rates among children under five years old is greater than 40%.[19]

Informal settlements are defined by the UN Habitat Programme as residential areas where a group of housing units have been constructed on land to which occupants have no legal claim, or which they occupy illegally. Frequently, informal settlements can be tremendously overcrowded with substandard housing, unclean and insufficient quantities of water and inadequate sanitation. More than 60% of Nairobi residents live in informal settlements where poverty combined with infections, food insecurity, poor maternal nutrition and poor child feeding practices are readily apparent.[20] Thus this pilot study aims to describe differences in demographic and nutritional factors of children under five years of age living in informal settlements in Nairobi, Kenya and determine if there is a relationship to their growth and development.

Method

The survey was conducted in the informal settlements of Baba Dogo and Korogocho districts of Nairobi, Kenya between April 28 and May 5, 2014. Low-income residents with minimal resources characterize these sections of Nairobi. All children less than four years old seen at the Baba Dogo and Korogocho clinics were evaluated regardless of reason for visit. A one-hour training session to standardize methods of measuring height and head circumference was held. Using a standard tape measure, MABIS, height and head circumference were recorded to the nearest inch and then plotted on either the WHO or CDC height for age growth chart. Head circumference was measured in addition to height for age to more thoroughly assess malnutrition, and because both are commonly used to assess malnutrition. The WHO height for age growth chart was used for male and female infants and children zero to two years of age. The CDC height for age growth chart was used for male and female children two years of age and older. Additionally, a list of questions regarding feeding practices, which were to be asked of all participants' caregivers, was distributed to medical students assisting with the project. Written consent for the project was obtained from our local NGO collaborator. Each parent gave verbal consent. The Ross University School of Medicine IRB approved the investigation, and it was conducted in accordance with the Belmont Report and the tenets put forth in the Declaration of Helsinki. The Belmont Report identifies basic ethical principles that should underlie biomedical and behavioral research involving human subjects and provides guidelines, which assures that research is conducted in accordance with those principles.[21] The Declaration of Helsinki is a set of ethical principles regarding human experimentation developed for the medical community by the World Medical Association and is regarded as the cornerstone document on human research ethics.[22]

Independent Variable

There are five independent variables for this investigation: age (months), whether the child was breastfed, age at weaning of breast milk (months), age fully stopped breast-feeding (months), whether the child received protein from their daily diet and if so, how often. Using weaning of breast milk as a variable could present a problem in the accuracy of results because weaning periods vary between individuals and could take place over a short period of less than one month or over several months. The ratio of solid foods to breast milk could vary widely among the study population.

Dependent Variable

The dependent variable for the investigation was growth percentile. Measurements were taken of all children presenting to the clinics. Growth chart percentile was calculated using WHO or CDC height for age growth percentile charts.23 Percentile was categorized as less than 50th percentile (coded as 1) or equal to or greater than 50th percentile (coded as 0).

Analysis

Descriptive statistics (median, interquartile range, mean, standard error for quantitative variables, and frequency and percentage for qualitative variables) were calculated for all independent variables. Two-sample Wilcoxon rank sum tests were used to test for significant differences

Table 2. Frequency Distribution of Proteins Eaten for Children Less than Four Classified as in the Greater than or Equal to the 50th Height Percentile and Less than the 50th Percentile in Baba Dogo and Korogocho Clinics, Nairobi, Kenya April 28, 2014 to May 5, 2014

Protein Eaten	≥50%	<50%
Three Times a Day	0(0)	4(100)
Twice a Day	0(0)	6(100)
Once a Day	7(50)	7(50)
Rare Intake	0(0)	1(100)
Mainly Breast Milk	6(32)	13 (68)
No Daily Intake	2(40)	3(60)
Unknown	2(10)	18(90)

for each continuous independent variable between height percentile less than 50 percent and height percentile equal to or greater than 50 percent. Chi-square tests were used to test for significant differences in categorical independent variables between height percentile less than 50 percent and height percentile equal to or greater than 50 percent. An a priori alpha level of .05 was used to test for significant differences.

When examining relationships of continuous variables and assessing prediction, linear regression is the preferred methodology.[24] Partial F testing was used to test if variables were significant predictors of height in centimeters using an a priori alpha level of .^{20} for model selection.[24] Significant predictors and interaction terms were entered into linear regression models. Height in centimeters was modeled in a linear fashion, and height percentile was modeled as a logit transformation of percentile.[25–27]

Results

There were a total of 69 children participating in this investigation. The majority of participants were male (n=39; 57%); the median age of participants was 18 months (IQR: 20 months); the median height was 77cm (IQR: 13cm); and the median age-adjusted height percentile was 10% (IQR: 47%). Participants were divided into those equal to or greater than the 50th percentile and those less than the 50th percentile (n=52; 75%) on the WHO and CDC height-for-age growth chart.

Descriptive statistics for the cohort can be seen in Table 1. The majority for males and for females were categorized as less than the 50th percentile of height. Those children in the less than 50th percentile group tended to be older, weaned at an average older age (although at the same median age), but stopped breast-feeding at about the same age. There were no significant differences between the groups. No statistically significant differences were detected between the independent variables for those in the 50th percentile or greater in height versus those in the less than 50th percentile.

The frequency of protein intake can be seen in Table 2. Ten participants consumed protein more than once a day, for three times daily and six twice daily, all falling in the less than 50th percentile group. Seven participants in each group consumed protein once a day. More children in the less than 50th percentile tended to have a rare intake of protein (less than seven times a week), have a diet consisting of mainly breast milk and have unidentified protein consumption. Children with no daily protein intake appeared to be equally divided.

A linear regression model was constructed to predict the height of participants based on the age at which each participant was weaned (months), the age at which each participant stopped breast-feeding (months), whether the participant received protein (reference: no), whether the participant was female (reference: male), the age of the participant (months), and a gender-age interaction term. Partial F testing was conducted and the following variables were not found to contribute significantly to the prediction of height in centimeters: age participant was weaned (months), age participant stopped breastfeeding (months), and whether the participant received protein (reference: no). Gender (reference: male) and age in months were significant predictors of height in centimeters. Another model was constructed using the same variables (age, gender and gender-age interaction) for a logit transformed model of height percentile. Results for both models can be seen in Table 3. All analyses were done using R software.[29]

Discussion

75% of children less than four years of age living in the informal settlements of Baba Dogo and Korogocho, Nairobi, Kenya, were found to be less than 50% on the WHO and CDC growth curve, height-for-age, supporting our hypothesis. 23 of 30 females (77%) and 29 of 39 (74%) males were in the less than 50th percentile for height-for-age. We know stature is part of a multi-factorial process including political atmosphere, water and sanitation, food and agriculture and education.[5] We were able to determine that more children in the less than 50% group had rare or unknown daily protein intake. This measurement was determined by our questionnaire leading to a subjective answer. Food security questions such as the availability and access to food, as well as availability and access to clean water were not addressed.

Those in the less than 50th percentile were weaned from the breast at an older age, but stopped breast-feeding at approximately the same age as those in the more than 50th percentile group. With the design of our study we were unable to demonstrate a link between malnutrition, little protein intake, and inappropriate breastfeeding and short stature. The only statistically significant predictors of height in our sample were age and age-for-gender interaction.

A similar study performed in an informal settlement community of Kibera, Kenya showed a majority of caregivers were experiencing a food shortage at the time of the survey. The study found the prevalence of stunting overall in children six to 59 months was 47% and increased to 58% in children aged 36 to 47 months with a similar distribution between genders: males having 51% and females having 49%.[18] During this time in the children's lives, they begin to feed themselves and eat their family's diet. As such, they become more susceptible to poor nutrition with decreased availability of solid food, protein and energy intake and poor weaning practices.[30]

Numerous other studies suggest that children in Kenya have short stature – a possible indicator of poor nutrition.[30] A study performed in another informal setting of Dagoretti, Nairobi, Kenya, showed that 25% of the children surveyed were stunted, 15% were underweight and 10% experienced wasting, which refers to inadequate nutrition over a shorter period of time. This study also found that there were more boys than girls who were stunted, similar to our findings. Additionally, the researchers found that breakfast contributed to 10% of the daily energy intake of children (adequate is 20-30%) and fewer children consumed foods from greater than four food groups.[31] Finally, it was shown that the incidence of diarrhea, colds and coughs increased the risk of stunting and being underweight.[31]

Another study performed in Uasin Gishu County, one of the 47 counties in Kenya, compared nutritional status of orphaned and separated children and adolescents living in households with extended family, children's charitable institutions, and on the streets found that 74% of study participants were stunted according to WHO standards.[32] This is in agreement with our findings of roughly 75% participants being less than the 50th percentile of height-for-age. Interestingly, the Uasin Gishu County study found those living in households with extended family to be two to three times more likely to be stunted than those in children's institutions.[32] Additionally the researchers determined that street youth were six times more likely to be stunted compared to the children living in children's institutions.[32] This study suggests that the children living in households with extended family or on the street were chronically under- or malnourished.[32] A potential reason why this study could be valid is because children living in households with an extended family with multiple people, could be consuming the left-over food instead of receiving an adequate portion. Additionally, kids living on the street are usually scrambling for food and will eat whatever they can find. Both of these situations could lead to under or malnutrition.

In a rural Uganda study, results showed that socioeconomic indicators, namely a mother's education, correlates with the inequalities in children's health and nutrition using growth stunting as the proxy for the inequalities. A mother's education was found to be a robust predictor for inequalities of child health and nutrition.[8] Another study performed throughout five countries in sub-Saharan Africa highlighted the need for education of parents and healthcare professionals in order to increase their knowledge of breast-feeding, vaccination programs and over- and under-nutrition.[33]

Table 3. Beta coefficients, standard errors, *P* values, and 95% confidence intervals for a linear regression model predicting height in centimeters and logit transformation of height percentile

	Linear Model				**Logit Transformed Percentile**			
Independent Variable	**β**	**SE(β)**	***P* value**	**95%CI**	**β**	**SE(β)**	***P* value**	**95%CI**
Intercept	58.19	1.58	<.0001	(55.04, 61.34)	-2.67	0.81	.0015	(-4.29, -1.06)
Female	1.42	2.39	.5543	(-3.36, 6.20)	1.85	1.23	.1353	(-0.59, 4.30)
Age	1.04	0.07	<.0001	(0.89, 1.19)	0.04	0.04	.2970	(-0.04, 0.12)
Female x Age	-0.27	0.10	.0103	(-0.48, -0.07)	-0.11	0.05	.0440	(-0.22, -0.01)
Adjusted R^2			0.8199				0.0252	

Conclusion

Undernutrition and malnutrition are major problems in the informal settlements of Baba Dogo and Korogocho districts of Nairobi, Kenya. 52 of the 69 participants in our study were classified as being in the less than 50th percentile for height based on the WHO and CDC growth chart for height-for-age which is suggestive of chronic malnutrition. These children were weaned from the breast at an older age and were classified as having rare protein intake. These findings could imply that these children are not being supplemented or fed proper nutrition. Unfortunately, we were unable to examine any relationship between protein intake and breastfeeding habits and short stature perhaps due to some of the limitations we faced.

The main limitation in our study was the relatively small sample size. The population was limited to those children who visited the clinics organized by the Ross University School of Medicine, since the medical students did not actively seek out participants. As such, this population could be biased since the children in our sample were actively seeking out medical care. The study could have been improved by actively seeking well children in the community and increasing the sample size. Similarly, with this possible predisposition to acute and chronic illness in our sample chief complaint, diagnosis, HIV status and mean parental height were not recorded during their clinic visit. Chronicling data of this sort would allow us to improve on cause or predisposition to short stature. To more accurately diagnose acute and chronic malnutrition, weight of each participant could have been measured to look at weight-for-age and weight-for-height. Additionally, the young age of participants in the study was a limitation. The young age of the participants limits the generalizability of the study. Further, by only examining the first few years of life this study could not obtain a complete picture of early childhood nutrition.

To adequately determine the prevalence of early childhood malnutrition, future investigators could conduct studies comparing children who live in informal settlements to children who live in an urban apartment/single family home. Questions regarding protein, fat and carbohydrate intake as well as the intake of daily vitamins could be addressed. Furthermore, the investigators could follow these two groups of children into adolescence, measuring their growth at various stages of development and compare their stature and nutritional habits. Additionally, future investigators could record the parental height of children living in informal settlements to those living in an urban apartment/single family home which may give some insight on the role nutrition versus genetics plays in linear development.

Future studies could also compare stature in breast fed infants to non-breastfed infants living in both informal settlements compared to an urban apartment/single family home to determine if breast milk has a role on linear childhood growth. This would be a fascinating study, since the majority of children included in this study were exclusively breastfed.

Key Messages

Future research in this discipline should focus on the difference between children under four living in the informal settlements of Baba Dogo and Korogocho and children under four living in an urban apartment/single family home. This could allow future investigators to determine if factors such as food insecurity, poverty, maternal malnutrition, overcrowding, poor access and availability to water and sanitation have an effect on growth and development.

Nutritional programs and supplementation in the informal settlements of Baba Dogo and Korogocho should be a focus of aid groups working in Eastern Africa, specifically Kenya, to confront this chronic issue of malnutrition. In an effort to address the burden of malnutrition, Kenya signed up to the Scaling up Nutrition (SUN) Movement in 2012, which combines governments, civil society, private sector, researchers, United Nations and donors to implement both nutrition-specific and nutrition-sensitive interventions and strategies to address malnutrition. Furthermore, Kenya has developed a national nutrition action plan for 2012 to 2017 that lists 11 strategic objectives combating malnutrition and over nutrition. These include improving the nutritional status of children under five years, which entails increasing exclusive breastfeeding practices, timely introduction of complementary feeding and micronutrient supplementation.

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Mental Health in Haiti: Beyond Disaster Relief

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Haiti, one of the poorest countries in the world, was devastated by an earthquake in 2010. The disaster uncovered the realities of a non-existent mental health care system with only ten psychiatrists nationwide. Attempts were made to assess the increased prevalence of mental illness, likely due to the trauma to which many were exposed. Several interventions were carried out with aims to integrate mental health into primary health care services. The interplay between socio-cultural beliefs and health (both mental and physical) in Haiti has been widely commented upon by both foreign aid and local caregivers. Observations frequently highlight barriers to the willingness of patients to seek care and to their acceptance of biomedicine over traditional Vodou beliefs. The perception of Haitian beliefs as barriers to the availability and acceptance of mental health care has intensified the difficulty in providing effective recommendations and interventions both before and after the earthquake. Argued in this review is the importance of considering the interactions between socio-cultural beliefs and mental health when developing models for the prevention, screening, classification and management of mental illness in Haiti. These interactions, especially relevant in mental health care and post-disaster contexts, need to be acknowledged in any healthcare setting. The successes and failures of Haiti's situation provide an example for global consideration.

Introduction

The United States Surgeon General's "Mental Health: Culture, Race, and Ethnicity" report outlines how the "culture of the patient influences many aspects of mental health, mental illness, and patterns of health care utilization."[1] These aspects encompass help-seeking behavior, including the form of care sought (i.e. local, traditional, Western), the social supports for mental illness, stigma attached to disease and the meanings people associate with their symptoms and illnesses. In Haiti, cultural, Vodou (also spelled Voodoo) and social beliefs help inform explanations of illness, especially mental illness, which is frequently attributed to supernatural forces such as spells, hexes or curses. This aligns with a cosmocentric perspective, in which the individual is a member of a larger universe comprised of Iwa (spirits), relationships and the natural world. This can be compared to an anthropocentric perspective, whereby an individual views oneself as central and in control of their existence, including on matters of health and disease.[2] For the purposes of this review, the broad category of "mental health" will include a wide spectrum of mental disorders such as depression and anxiety, drug and alcohol abuse, schizophrenia, bipolar disorder and other severe and disabling disorders. The World Health Organization (WHO) also identifies neurological conditions, such as Alzheimer's disease and epilepsy, as worthy of consideration alongside these mental disorders, as they share common healthcare resources, a feature that makes such conditions relevant within a discussion of Haiti's insufficiency of mental health resources.[3,4] As reported in the Global Burden of Disease (GBD) study, mental and behavioral disorders not including neurological conditions accounted for 7.4% of the global burden of disease in 2010, as demonstrated by disability-adjusted life years (DALYs).[4] This health gap measure extends beyond assessing the potential years of life lost to premature death, encompassing as well the years of healthy life lost in individuals in states of poor health or disability. Hence, one DALY can be thought of as one lost year of healthy life with the sum of DALYs across the population generating the total burden of disease.[4,5]

Since the 2010 earthquake, there has been increased international attention surrounding the mental health needs and the lack of pre-existing formal services available in Haiti.[6] Subsequent epidemiological studies have identified and evaluated the large mental health impact of the earthquake and have provided insight into methods to integrate mental health into the post-earthquake health response.[7] Knowing how exactly to deliver these services innovatively relied heavily upon the understanding of the current healthcare systems in place, including the traditional religious healing practices.[7] Efforts to improve mental health services, and to reduce the overall burden of mental illness and inequities, must account for the intricacies of the complex relationship between cultural beliefs and mental health, rather than view them as major obstacles. This consideration for delivering mental health care in a culturally competent manner can be applied beyond Haiti in the development of interventions in post-disaster circumstances and in low-income countries globally.

Background

Haiti is a country located on the island of Hispaniola in the Caribbean with a population of more than ten million people. Haiti was the most affluent French colony in the New World prior to its independence in 1804; however, in order to be recognized as an independent nation, France required a large indemnity to be paid, which crippled Haiti's economy.8 Political instability, mismanagement and corruption exacerbated by exploitation by foreign governments and investors have since left Haiti one of the poorest countries in the world with a per capita gross domestic product (GDP) of 846 in US dollars (USD$) in 2014.[8] According to the Human Development Report, Haiti has a rate of multidimensional poverty of 57%, whereas in Uruguay only 2% of the population are multidimensionally poor. The Multidimensional Poverty Index (MPI) replacing the Human Poverty Index (HPI) extends beyond standard monetary-based methods to also identify deprivations in health, education and standard of living.[9] Haiti is also plagued by severe economic disparity, with a Gini index of 60.8 as of 2012.[10] The Gini index is a measure of income inequality - the extent to which the distribution of income within an economy deviates from a perfectly equal distribution - with an index of 0 representing perfect equality and an index of 100 implying perfect inequality.10 For context, France (with which Haiti has a shared history) had a Gini index of 33.1 in 2012, and the Dominican Republic (which coexists with Haiti on Hispaniola) had a Gini index of 47.7 in 2013.[10] Haiti is vulnerable to natural hazards due to its location directly in a hurricane corridor, which makes it susceptible to hurricanes and tropical storms, and its tectonic position which gives it a higher seismic threat level.[11] Furthermore, high levels of deforestation and environmental degradation in Haiti worsen flooding and lead to mudslides. Over the years, these extreme weather events have led to the destruction of crops and infrastructure, internal displacement and the loss of many lives. Unfortunately, the extreme level of poverty, weak buildings and poor emergency response has made the population increasingly susceptible to and unable to cope with the devastating effects of these events.[7]

On the afternoon of January 12, 2010, Haiti experienced an earthquake measuring 7.0 on the Richter scale with 52 recorded aftershocks. Reports from the Haitian government along with the International Organization for Migration (IOM) and the United Nations Development Program (UNDP) estimated the death toll to be approximately 222,000 with over 300,000 people physically injured.12 Approximately 1.5 million people were reported as homeless following the earthquake and were forced to inhabit makeshift camps, delivered in large-scale by humanitarian assistance.[12] Within days, internally displaced person (IDP) settlements developed around the capital city of Port-au-Prince and at the peak of the crisis there were some 1,500 camps sheltering IDPs scattered across the capital and surrounding regions.[12] Many were still left without adequate access to food, water, healthcare, shelter or security due to the scale of the disaster and the large numbers of IDPs inhabiting the settlements.

To worsen the situation, in October of the same year the worst cholera outbreak in recent history killed approximately 7,700 people and infected over 620,000 by 2012.[7] It is of great significance, but beyond the scope of this paper, to discuss the details and implications of the controversy surrounding the cause of the disastrous outbreak; however whole genome sequencing traced the source of the epidemic to United Nations (UN) troops from Nepal stationed in Haiti.[13] The poor quality of sanitation and limited access to clean water caused by the earthquake facilitated the spread of infection, which poses additional challenges for ongoing earthquake relief efforts.[14] Furthermore, Haiti's already insufficient health care system was further crippled by the earthquake, rendering efforts to find and record cases and implementations of outbreak control, prevention and surveillance measures near impossible.

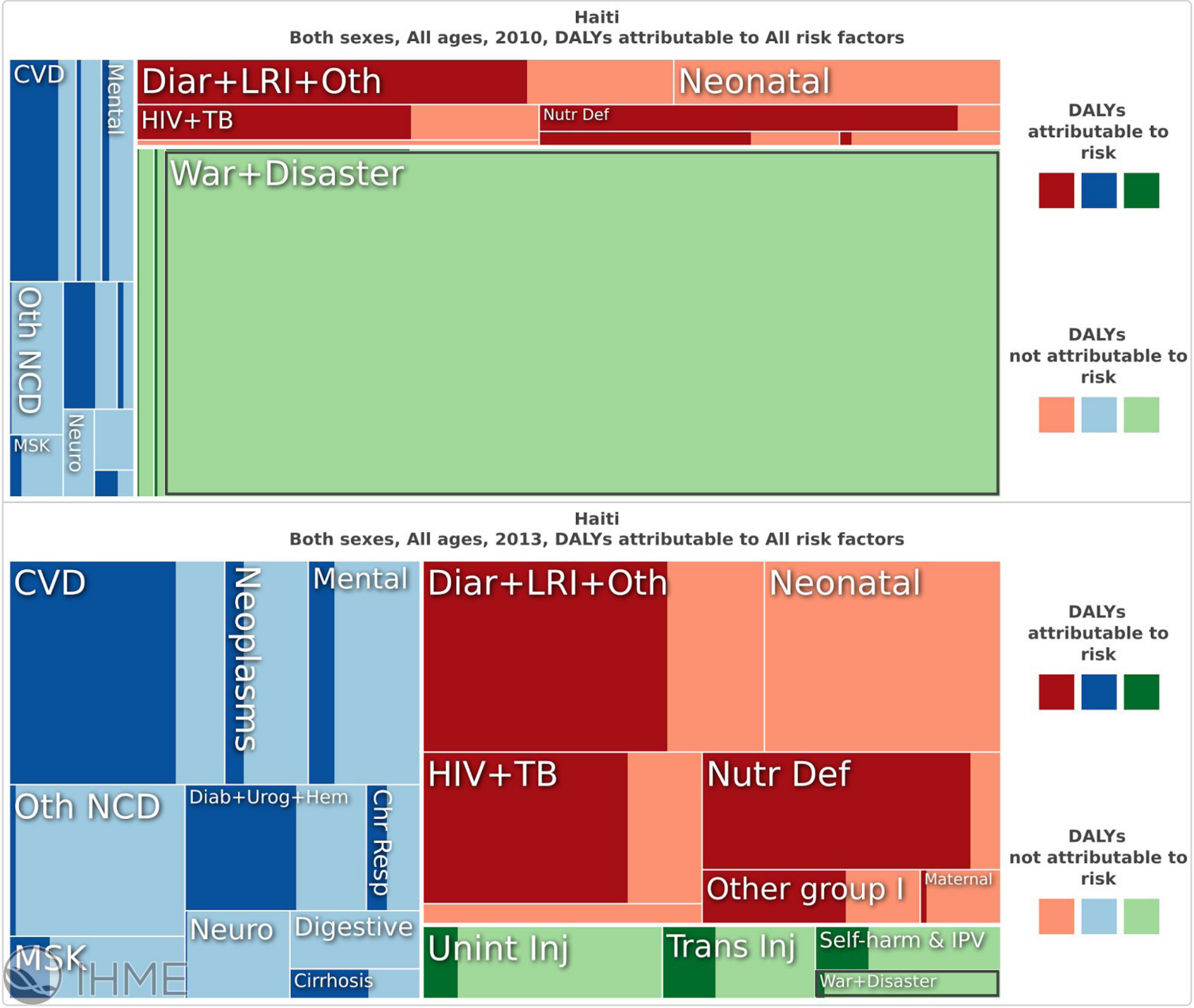
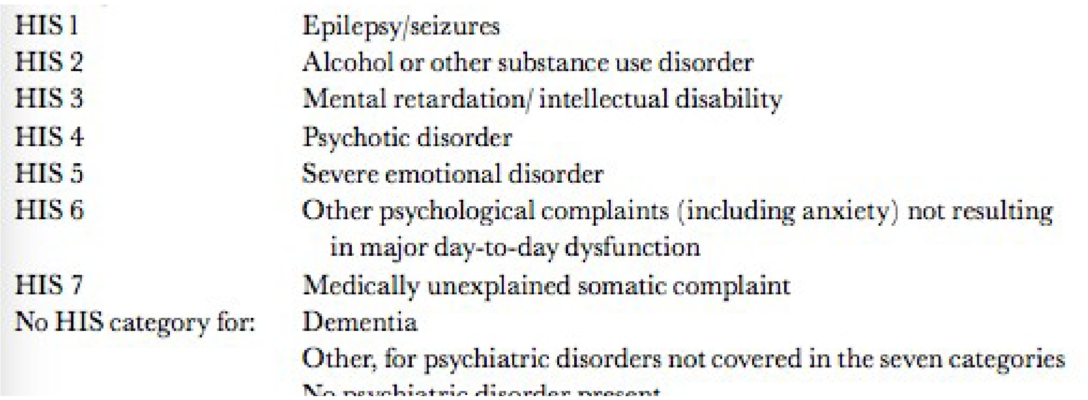


Figure 1: GBD Compare in Haiti in 2010 and 2013, both sexes, all ages, DALYs attributable to all risk factors. The top chart displays the risk factor of war and disaster in Haiti attributing to 66.65% of total DALYs and mental disorders attributed to 1.25% of total DALYs in 2010. In 2013 these figures change to 1.26% and 5.82% respectively, displayed in the bottom chart.[17]

There are four sectors in the Haitian health system that will be mentioned and discussed throughout this paper. The public sector is run by the government Ministry of Public Health and Population (MSPP) and holds 36% of the health facilities in Haiti in addition to community health units (CHU) at the local level.[15] Non-governmental organizations (NGOs) and the religious and traditional medical services constitute the private non-profit sector, while a small private for-profit sector is comprised of specialists in physician's offices or clinics mostly in the country's capital. In a mixed non-profit sector, the private sector manages the care; however, the staff are paid by the public sector.[15] The provision of mental health care before and after the earthquake by these various sectors will be analyzed as well as an evaluation of their collaborative efforts to deliver culturally competent care for the mentally ill.



HIS 1	Epilepsy/seizures
HIS 2	Alcohol or other substance use disorder
HIS 3	Mental retardation/ intellectual disability
HIS 4	Psychotic disorder
HIS 5	Severe emotional disorder
HIS 6	Other psychological complaints (including anxiety) not resulting in major day-to-day dysfunction
HIS 7	Medically unexplained somatic complaint
No HIS category for:	Dementia
	Other, for psychiatric disorders not covered in the seven categories
	No psychiatric disorder present

Figure 2: UNHCR Health Information System (HIS) for use in humanitarian settings: Mental Health Categories[24, 48]

Mental Healthcare Provision

After the Earthquake

With inadequate resources and many structural and cultural barriers to the provision of care for the mentally ill, the burden of mental illness is frequently unrecognized and poorly addressed in low-income countries (LICs).[16] The devastating earthquake in Haiti not only uncovered the extent of the burden of mental illness but also amplified it. Much of this was evident when foreign medical aid arrived in the acute aftermath of the disaster. NGOs providing acute care to those suffering from mental distress after the earthquake provided anecdotal evidence of this rising burden. However, due to the lack of reporting and monitoring systems, the full extent of the problem was not quantified.

The main causes of death in Haiti—those with the highest attributed DALYs—were infectious diseases affecting the gut or respiratory tract, HIV/AIDS and tuberculosis (TB), as well as malnutrition, maternal death and assault.[17] In 2010, however, it was recorded that natural disasters accounted for 66.65% of DALYs (55.11-81.32%).[17] To put this figure in context, however, this percentage of DALYs attributed to acute effects of natural disasters would drop to only 1.26% (0.5-2.91%) of DALYs in 2013[17] (Figure 1). Secondary outcomes arose as a consequence of exposure to forces of nature and disaster, but more chronic conditions such as depressive disorders and anxiety became the more significant causes of burden on the population in 2013. Comparing the percentages of total DALYs attributed to mental and substance use disorders reveals an increase in the mental health illness burden from 1.75% (0.95-2.59%) to 5.82% (4.45-7.3%) between the years of 2010 and 2013[17] (Figure 1). The distribution of various diagnoses observed in the psychiatric hospitals has been estimated by the WHO: schizophrenia (50%), bipolar disorder with mania (30%), other psychoses (15%) and epilepsy (5%).[18] Although these numbers are not uncommon within hospitalized patient populations in other countries, a team present in Haiti at this time observed that they do not accurately depict the true prevalence of these disorders in the general population due to the lack of reporting systems and of facilities themselves.[7,19]

It is well documented that after a traumatic event such as war or a natural disaster, one can experience serious adverse psychological effects.[20] Many Haitians were subjected to an immense amount of trauma and loss—loss of a loved one, their home, business, or livelihood—or were subjected to sexual assault and physical abuse upon displacement and increased social instability. With the addition of the cholera outbreak, many witnessed the deaths of loved ones. A study of 950 families found that 62.5% of respondents lost one family member during the earthquake.[21] The burden of all mental health disorders was poorly detailed before the earthquake, which makes estimating its relative increase in the general population in the aftermath difficult. However, to obtain a general view of the effects, a population-based survey conducted two to four months following the earthquake among 1,323 people affected found prevalence rates of 28.3% and 24.6% for major depressive disorder (MDD) and post-traumatic stress disorder (PTSD), respectively.[22] Another team administered a questionnaire to study the prevalence rates of PTSD and depressive symptoms in 1355 adults (660 women) 30 months following the earthquake. The rates of PTSD and depressive symptoms were found to be 36.75% and 25.98%, respectively.[23] A team of foreign psychiatrists from the International Medical Corps set up weekly mental health clinics in eight mobile clinics and a liaison service in the partly destroyed University Hospital, l'Hopital de l'Université d'État d'Haiti (HUEH). The most common mental health category, based upon the Health Information System (HIS) diagnostic categorization of mental health for use in humanitarian settings, was "other psychological complaints," which accounted for 55% of all patients seen (431 patients over the first 5 months).[24] The majority of these complaints were of anxiety, usually centered around buildings falling down, or of losing loved ones. Symptoms of grief were very common, although difficult to disentangle normal from aberrant reactions. Interestingly, results from the subsequent five months displayed a tenfold reduction in patients presenting with minor disorders as categorized in HIS 6, while severe emotional disorders (HIS 5) increased from 3% to 21%, and medically unexplained conditions (HIS 7) from 1% to 15%24 (Figure 2).

Case Reports

In the acute aftermath of the earthquake, the lack of resources and personnel pre-empted the implementation of a screening system, which limited the collection of data on those most affected by both the earthquake and various mental illnesses. Mental health problems were considered secondary to the basic needs of food, water, emergency medical care, shelter and security. However, the need for psychological first aid and psychiatric treatment was apparent to humanitarian assistance efforts.[25] Foreign psychiatrists traveled to Haiti to counsel patients and to help quickly train Haitian doctors. In the months following, those particularly at risk for mental health problems were survivors with physical injuries, IDPs, children in need of protection and those at risk of gender-based violence. Additionally, those with pre-existing or past mental illness were found to be more vulnerable to secondary mental health effects of the earthquake.[7] These foreign psychiatrists saw reactions to the trauma ranging from anxiety to psychosis. Dr. Lynne Jones, a child psychiatrist and disaster expert with the International Medical Corps, reported in Sontag's interview her common sighting of "earthquake shock," a persistent sensation that the earth is still shaking causing the heart to race and chest pain.[25] Furthermore, the rise in mental illness in the general population after the earthquake was noted to put a further strain on the availability of mental health sensation that the earth is still shaking causing the heart to race and chest pain.[25] Furthermore, the rise in mental illness in the general population after the earthquake was noted to put a further strain on the availability of mental health care resources for those already presenting with mental illness.[7]

A medical student relaying her personal account of volunteering in Haiti after the earthquake commented on the challenges she encountered.[26] Although she had initially intended to work with an internal medicine team, she was enlisted to help with the much-needed provision of mental health care due to her prior experience as a psychiatric resident. She cared for a woman who was suffering from phantom limb pain and panic attacks following an emergency amputation. The patient had divulged to a Haitian-American volunteer her suspicions and distrust of American doctors who had "taken" her leg unnecessarily. The medical student's first-hand experience illuminated for her the importance of training psychiatric residents in delivering mental health care in a culturally competent manner. Such an individual narrative was not unique; several reports conveyed misunderstandings and poor communication between patient and clinician in Haiti in the aftermath of the earthquake and emphasized the need for culturally competent mental health care.[1, 7, 27] Beyond the setting of Haiti and post-disaster mental health care, the impact of culture on what all people bring to the clinical setting has been widely discussed in medical literature.27,28 The challenges that foreign psychiatrists faced in the post-earthquake environment and in practicing transcultural psychiatry transcend beyond Haiti and have wider implications for improving mental health care services globally.

Exposing the Lack of a Mental Health System

A wide gap exists between the need for treatment for mental disorders and its global provision—76-85% of people with severe disorders failing to receive treatment in low- and middle-income countries.[3] Haiti's case perfectly exhibits the scarcity, inequitable distribution and inefficient allocation of resources for mental health seen around the world. With only about fifteen psychiatrists working in the public sector in all of Haiti before the earthquake, there was little support for those with mental illness.[25] Statistics from the WHO collected in 2014 quantify this lack of human resources at 0.07 psychiatrists and 0.29 nurses working in the mental health sector per 100,000 people. The global median number of mental health workers is 9 per 100,000, albeit with extreme variation between low-income and high-income countries. Only 30% of health facilities were public, and 70% of rural health services were provided by NGOs, with 40% of the rural population having no access to primary health care, given the concentration and so over-centralization of most services and hospitals in the capital.[5,8] The Mars and Kline Psychiatric Center in Port-au-Prince for acute mental illness and Défilé de Beudet in Croix-des-Bouquets, a hospital for the chronically mentally ill, are the two state-run psychiatric hospitals in the country. To further portray this lack of mental health service availability and compare it to a developed healthcare system, the number of beds in mental hospitals per 100,000 people in France was 89.65 while there were only 1.72 beds per 100,000 in 2014 in Haiti. Globally, there were 17.5 beds per 100,000 beds in 2014 in mental hospitals.[5] This over-centralized and under-resourced system in Haiti reflects its status as a low government priority in comparison with issues such as HIV/AIDS, tuberculosis, or maternal and child health which had limited, but relatively more available resources.

Dr. Franklin Normil, the acting director of the Mars and Kline Psychiatric Center, relays a first-hand account of this in an interview with the New York Times: "I want you to bear witness, clearly mental health has never been a priority in this country. We have the desire and the ability, but they do not give us the means to be professional and humane."[25] Working without pay for five months, he highlights again the lack of resources as the limiting factor, not ability or willingness: "Even before the earthquake, we did not get the resources to feed or clothe our patients properly. We had barely any staff, and these are patients who could be rehabilitated if we had the means."[25] Government expenditure on mental hospitals as a percentage of total government expenditures on health was only 0.61% in Haiti in 2011.[29] The per capita government expenditure on health at average exchange rate (US$) in 2011 was 13. To compare this again to a developed nation, this same figure stood at USD 3816 in France in 2011 with the percentage spent on mental hospitals of this standing at 12.91%.[5] The global median percentage of government health budget expenditures dedicated to mental health is 2.8%.[5] The need remains for a national mental health plan or policy, systems of monitoring and evaluation and epidemiological research.[30] This shortage of resources and governance of mental health is in stark contrast to the services available in the highly developed mental health care system in France. However, this situation is not unique to Haiti: the gap between resources and burden is far larger in low-income countries in comparison to high-income countries. Almost half of the world's population lives in a country where there is at most one psychiatrist to serve 200,000 people.[31]

The lack of mental health services was brought to worldwide attention after the 2010 earthquake when foreign aid recognized the gaps in provision of care. A team of mental health experts led by Mental Health Director Giuseppe Raviola from Partners in Health (PIH), a non-profit global health care organization, and Zanmi Lasante, its sister organization in Haiti, overviewed the earthquake response from the perspective of mental health in a landmark paper published in Psychiatric Clinics of North America in 2013.[7] They remark that although the earthquake has been the key catalyst for acknowledging the lack of an existing healthcare system, it provides a valuable opportunity to initiate change. Despite their harrowing effects, emergencies like the 2004 tsunami in Indonesia and the recent Ebola outbreak in Guinea have prompted these countries to rebuild better, sustainable mental health systems.[32,33] However, the wide range of cultural and social tendencies that will now be discussed present more barriers than the absence of care.

Vodou and Mental Health: Implications for Care-Seeking Behaviors

Although there are great variations present within the Vodou belief system around the world and Vodou is practiced to different extents in Haiti, it plays a nearly universal role in all aspects of Haitian life including politics, ethics and health. Max Beauvoir, the "Ati" or supreme leader of Haitian vodou, explained that with around 70% of Haitians believed to practice vodou and more than 60,000 vodou priests across Haiti, "Vodou is the soul of the Haitian people and nothing can be done without that cultural basis. It is a way of life."[34] Beauvoir expresses how Vodou has always been on the frontline for well being, stating that "Vodou heals the mind, soul and body. The soul is what we are, which controls everything, all our actions and mind".[34] A conceptual health framework exists of how to promote, prevent and treat health problems.

The interpretation of illness within this framework usually takes two forms: one is based on the need to establish a harmonious relationship with the spirit world and the second focuses on the role of magic or sorcery attacks.[30] The implications of these beliefs impact the selection of treatment and the perception of all illnesses. However, the focus will be on the beliefs concerning mental health, in which they are particularly ardent.[2] Indeed, as Paul Farmer observed: "Etiologic beliefs may lead the mentally ill away from doctors and toward those better able to 'manipulate the spirit.'"[35] Examples of those believed to be better suited by these patients are doktè fèy or medsen fèy ("leaf doctors" or herbalists), houngan or manbo (Vodou priest or priestess), pikirist (parenteral injectionist) or fanm saj (perinatal and natal care).[30]

Evidence of this favoritism toward traditional, community-led healing practices was displayed by a cross-sectional survey performed by Wagenaar et al. in 2011, showing that three out of four rural Haitians said they would seek community resources (this category included a Vodou priest, church pastor or priest, community health worker, herbal healer, community chief or an NGO) over clinical care at hospitals or clinics if suffering from mental distress.[6] This has broad implications for the types of interventions that would have the most impact, which will be examined further. It is important to keep in mind, however, that the limited and ineffective encounters with the biomedical system in treating mental illness in Haiti act as a deterrence from biomedicine towards Vodou healing practices. Also, this does not address the general openness of Haitians to receiving care from biomedical providers.[2] The view that structural inadequacies and limited options in mental health care are the main obstacles to the uptake of biomedical treatment in Haiti, rather than a cultural belief in its efficacy, has been widely argued and supported by both health resource statistics and anecdotes from professionals and patients alike.[2]

Assuming that the health-seeking behavior of Haitians is the limiting factor to uptake of mental health care in rural Haiti ignores the insufficiency in the provision of services and undervalues the need and urgency to build an effective, far-reaching mental health care system. Kate Ramsey in The Spirits and the Law emphasizes that "arguably no religion has been subject to more maligning and misrepresentation from outsiders over the past two centuries."[36] When looking to improve the quality and effectiveness of care, it is thus important to acknowledge and accommodate the intersection between such Vodou beliefs and treatment-seeking behavior, rather than regarding these beliefs as a main impediment.

The lack of mental health research in Haiti made it difficult to quantify and account for these implications. However, the International Organization of Migration (IOM) endeavored to analyze the interconnectedness of emotional, social and cultural anthropological needs among survivors in their Assessment on Psychosocial Needs of Haitian affected by the January 12th earthquake.[21] They administered the study to 950 families in displacement camps throughout Haiti, utilizing tools such as interviews and focus groups for the analysis of the various social levels: individual, family, group and community. Their results would help shape recommendations and the implementation of a multidisciplinary and multilayered psychosocial program. The average score of distress was found to be 8.32/35 with headaches being reported in 74% of interviewed families as well as sleeping problems (60%), anxiety (56%) and fatigue (53%). Additionally, 60% reported their level of pain at V on a scale from I to V. Idioms or definitions to describe pain were also recorded, with 33% of responses including some form of "call to God", and 17% of respondents explaining the feeling as "pain and sadness drowning me." Linking this back to the discussion of care-seeking behavior, when asked who would be their reference for feelings of uneasiness, 34% stated they would go to a friend for help, 22.1% would call on God, and 20.8% would go to a community health center.[21] This demonstrates a high level of social and cultural control over the comprehension and management of mental illness in Haiti, which calls for a thorough analysis of such factors and their consideration in prevention and treatment programs.

Social Beliefs and Disease Stigmatization

Besides treatment-seeking behavior, mental illness is also greatly nuanced by social beliefs. Blame for illness is usually displaced to something beyond the individual's immediate control; however, family members tend to feel a high degree of shame and often are unfortunately subjected to stigmatization in their communities.[37] An epidemiologic study carried out by Wagenaar and his team observed suicidal ideation endorsement on the Beck Depression Inventory (BDI), a 21-question psychometric test measuring depression severity with higher scores indicating more severe depressive symptoms.[27] They identified several social risk factors affecting this score: lack of care during illness, alcohol use, obtaining services from a Vodou priest, death in family, education and employment. Interestingly, women with higher education scored 7.[7] points higher on the BDI compared to uneducated women.[27] This may be a result of a disconnect between aspirations and reality, whereby women who fail to reach their potential manifest symptoms of depression. Another example is when the diagnosis of psychosis causes a patient to be labeled as fou (crazy) and viewed as permanently dysfunctional. This becomes a significant loss for a family, especially when the patient had a promising future in terms of their education and career; as a result, the family is often reluctant to acknowledge that a member is ill.[30]

This stigmatization of mental illness was recognized in the aftermath of the earthquake, and several underlying social beliefs were enhanced by the induced distress and other mental health effects of the earthquake on the population. The study by Wagenaar and his team found increasing BDI scores in men when more people had to live in their homes after the earthquake, and in women when a family member perished in the disaster.[27] The IOM assessment gained further insight into the effects of the earthquake on the economic, family, social and recreational life in Haiti. Some households, mostly headed by men, experienced the death of the primary breadwinner , and as a result many females expressed an increase in their responsibilities.[21] Men suffering disabilities from the earthquake reported feeling "less than human" and emasculated. Many respondents also reported aggressive behavior in the population as a whole following the earthquake, due to overcrowding, higher levels of distress and reactions to trauma and loss. Finally, the qualitative results of the assessment presented that the lack of proper passage rituals for many of the deceased caused distress related to guilt and preoccupations as to possible possession and retaliation from the deceased who did not receive a proper burial.[21] Mental illness externally attributed to a failure to please spirits would potentially allow for recovery by calling upon a spirit to intervene and assist healing on their behalf, a concept that could be harnessed in developing creative mental health solutions specific to Haitian social beliefs.[18,38] Such examples identify different mental health outcomes based on family and gender relations, and could also provide evidence for targeting certain risk groups.

The outbreak of cholera after the earthquake resulted in different but equally detrimental stigmatization against people who fell ill, causing families to lose their standing within the community. Partners in Health (PIH) and Zanmi Lasante (PIH/ZL) led sessions to aid psychologists in handling such situations and built upon the existing group therapy format used for those affected by HIV and TB. They led education campaigns on topics such as mental health, sexually transmitted diseases and palliative care, through which they were able to mitigate their stigmatization and encourage those affected to seek treatment.[39,40] Also, by using both a pre-existing infrastructure and model to aid the response, the PIH/ZL could establish a sustainable, integrated and community-based system of mental health care.[7] The staff at the IOM recognized that the disaster had pushed mental health into the open and that attitudes towards mental health were improving; the once marginalized groups of the mentally were becoming more integrated and accepted by the wider communities.[21] The stigmatization of mental illness in the social sphere, alongside the distrust in the biomedical system in the management of these disorders, were both necessary considerations in designing and implementing post-disaster interventions.

Significance for Intervention Strategies and Recommendations

Mental Health in Emergency Settings

As alluded to previously, emergency settings often act as an unparalleled opportunity to transform the mental health system due to the surge of international donor aid and increased attention to mental health issues. In a matter of years after the 2004 tsunami in Sri Lanka, the government was able to build a far-reaching mental health system through use of community-based posts; an example of the capitalization on the resources flowing into a country post-disaster.[33] Commonly in acute responses to disasters, insufficient attention is paid to identifying factors necessary for sustainably upscaling mental health services. In addition, the needs of people with severe mental disorders are slow to get recognition as the focus is usually centered around immediate responses to trauma. Furthermore, lack of consensus on standards and approaches among psychosocial agencies for providing mental health assistance after disasters left the global community unclear on how to align initiatives and implement them to create a sustainable solution.[24] This led the Inter-Agency Standing Committee (IASC) task force to form a set of guidelines addressing significant barriers, a model that is now well-established practice in emergency and conflict zone situations.[41] It was noted by the group from the International Medical Corps providing mental health mobile clinics according to these guidelines, that due to the sheer scale of the disaster in Haiti and the complete absence of mental health care availability in most conflict zone situations.[41] It was noted by the group from the International Medical Corps providing mental health mobile clinics according to these guidelines, that due to the sheer scale of the disaster in Haiti and the complete absence of mental health care availability in most rural communities, such guidelines were difficult to implement.[24]

At least 90 international and local agencies provided immediate assistance to Haiti, with response efforts including religious mourning ceremonies to support grieving and mobilization of resources and professionals to help those in extreme distress.[7] Only three agencies offered psychiatric care through clinics in Port-au-Prince.[24] Many challenges surrounded questions about how to deliver care in a culturally competent manner, and to what extent foreign aid should intervene if their models may prove to be unsustainable.[24] Partners in Health were key players in dealing with some of the mental health needs in the community, both responding to the emergency and creating a foundation that could be built upon by the Haitian government for greater local capacity over the long-term.[34] They also highlighted the need for the psychiatrist to act as an "integrator of psychobiological and psychosocial perspectives on mental health and illness,"[40] specifically adjusting for culture and local context.

A Psychosocial and Integrated Approach

On an individual level, reports have suggested that clinicians should acknowledge the attitudes and beliefs towards illness and avoid an "either/or" stance forcing patients to choose between biomedicine and traditional healing practices.[30,42] A study conducted by Khoury et al. comprised of interviews and discussions with community members and leaders, church members, health promoters, traditional healers and biomedical care providers in rural Haiti aimed to investigate whether explanatory models of illness invoking supernatural causation result in care-seeking from traditional healers and resistance to biomedical treatment.[2] They found that respondents were willing to receive care from both traditional and biomedical providers. Moreover, the folk practitioners expressed a desire to collaborate with hospitals and with the biomedical system; however, many respondents felt as though the biomedical system was largely ineffective at providing mental health care.[2] More research in this area would shed light on how these practitioners feel about the potential encroachment by foreign biomedical personnel on their field of expertise and influence, and help guide efforts to strengthen these relationships.

Akwatu Khenti, head of the Center for Addiction and Mental Health's (CAMH) Office of Transformative Global Health in Canada, aims for this collaboration between the two systems to improve outcomes by working together with spiritual leaders and sharing experiences of assessing and treating patients. The organization works with 40 religious healers to customize and deliver a type of psychotherapy—cognitive behavioral therapy—to treat mental illness in a way that would be most effective.[34] In this way, they are able to deliver care in a culturally competent manner and inform both patients and their caretakers that there are ways to successfully treat and cure disorders often deemed untreatable, especially through methods deviating from Vodou practices.

Recognizing that the capacity to assess mental health illness is a crucial first step to improve quality of care, a team set out to develop and validate a screening instrument for depression in Haiti following the earthquake. Rasmussen et al. aimed to integrate Haitian perspectives in an emic-etic approach, cognizant of the value of cross-ethnic and cross-cultural findings and the importance of ensuring that the research is culturally sensitive in designing models and implementing them with successful outcomes.[43] The emic-etic paradigm defined in 1937 by Brislin et al., is comprised of two perspectives: the emic perspective, or culturally informed, seeks to understand the meaning of that which is studied and its associations with other factors using that cultural framework. The etic perspective, on the other hand, is more culturally neutral, and involves evaluation through more "objective" constructs.[44]

Rasmussen and his team combined emic and etic perspectives to produce a screening instrument that incorporated local idiomatic expressions of emotional distress. They removed the possibility of missing any measured construct and avoided the imposition of solely biomedical notions of psychopathology on populations.[43] These benefits of an emic model, when coupled with those of an etic approach(i.e., the enhanced reliability through the standardization of measures), mitigates observation bias and lack of generalizability when solely using an emic approach.[45] Accordingly, their assessment studies of the screening tool produced results of high internal reliability, although they stated that the need remains for emic-structured clinical interviews for all mental health diagnoses.[43] This provides a good example of how to incorporate the local emic perspectives, language and idioms of mental health within an assessment tool that is culturally sensitive, and should be emulated in the development of other studies and interventions. Further research would be of great benefit for cases when traditional perceptions and management of mental illness diverge to such an extent from biomedically accepted strategies that the two are not compatible for optimizing patient outcomes. The ethical considerations of completely dismissing an explanation, perhaps spiritual in nature, for medical accuracy must be assessed to appropriately manage this tradeoff.

From the results of the IOM assessment study, the researchers echoed all these considerations and summarized a series of recommendations for psychosocial responses: produce culturally sensitive programs, avoid duplication of services, develop a mental health structure, integrate with other medical outreach services, integrate livelihood within these programs, protect vulnerable children, maintain mobile teams, introduce support modules in schools and launch awareness campaigns.[21] Rather than being viewed as obstructions to improving mental health service provision and acceptability, these beliefs and care-seeking behaviors should be harnessed as opportunities to collaborate with pre-existing, community-centered mental health providers.

Creating long-term solutions for such lack of mental health care will rely not only on these combined approaches and collaboration between providers, but also on the improvement of the mental health care system in Haiti. These improvements for long-term success range from the education and training of healthcare professionals to the design of patient referral systems. The MSPP of the public sector recognized that mental health had been a widely neglected area in primary health care, and that flaws existed in the educational system in mental health medical training. Structural changes have been made in Haiti to meet all patients' needs, including "task-shifting" to community health workers (CHWs) to identify potential cases and maximize efficiency in the use of expertise.[15] The adoption of task-shifting, or dedicating low cost mental health workers such as CHWs who operate at the community and clinic levels to supplement integrated care, will help with efforts to decentralize mental health care.[46] Furthermore, isolated clinical interventions may not have a beneficial impact due to the hesitation of some Haitians in seeking biomedical services, and thus utilizing community-based resources could be a more cost-effective, practical delivery of this care.[6]

Conclusion

The earthquake in 2010 exposed the burden of mental illness in Haiti, the lack of services to care for those affected and the socio-cultural influences implicated in the attitudes towards the mentally ill, their care-seeking behavior and relationship to mental health care providers. The mental health care system, already struggling before the earthquake, was severely damaged after the disaster and required assistance from foreign psychiatrists and psychiatric nurses. Moreover, this foreign aid needed to integrate the various beliefs of the people into treatments in a way that would improve patient outcomes.[47] In terms of providing mental health services, there were some successful attempts to integrate mental health care into the pre-existing structures used for HIV/AIDS and TB. Efforts that focused on building upon local capacity and task-shifting to community health workers were found to be successful in adopting an emic-etic approach. Such workers can carry out assessments, provide group therapy and educational sessions and liaise with other community resources such as Vodou traditional healers and aid organizations. Creating sustainable mental health care systems that reach rural communities will depend critically on such systems' appreciation of the various cultural and social beliefs in the explanation of mental illness. Increasing community engagement with health care workers allows for the creation of a network of services that is safe and welcoming and reduces the stigmatization of disease in the community.[24] The acceptability of care delivered by biomedical personnel among communities must not be underestimated, as presented by the report by Khoury et al.[2] At the same time, biomedically accepted approaches and explanations for mental illness must not be imposed without consideration for how they might be effectively integrated with traditional practices to achieve better outcomes.

Misinterpreting Haitian beliefs as barriers to the availability and acceptance of proper care for mental health patients pre- and post-earthquake intensifies the difficulties with providing effective recommendations and interventions. Structural inadequacies for the treatment of mental illness must be viewed as primary barriers before criticizing traditional healing systems and their knowledge of delivering effective care.

Investments are needed to build upon the health system platform for other diseases and to integrate mental health care as a part of primary health care. Furthermore, factors such as religion and social stigmatization must be acknowledged in any global setting, particularly for mental illness and even more so in disaster settings. Haiti's case can be used as an example to present how the lack of data and care for mental health in a low-income country can overlook a significant proportion of the country's disease burden. In moving forward, a strong cultural influence must be respected and incorporated into a long-term, sustainable intervention instead of being disregarded as an impediment to its success. Pressing future research includes the integration of culturally informed surveillance, diagnostic and therapeutic measures for mental illness into primary care services and the reduction of the destructive stigma attached to mental illness. Finally, the implementation of a collaborative model of mental health care delivery that involves "task shifting" from professionals to community health workers holds promise for resource-constrained settings. A focus will now be on how these models can be scaled up and sustained to have the largest impact on global mental health care access and quality.

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A Doctoral Student Complementarity Approach (DSCA) for Global Health Research

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A large and growing number of doctoral students are involved with global health research. Here we outline the Doctoral Student Complementary Approach (DSCA), a strategy to connect doctoral students from high-income countries (HICs) with counterparts from low-income countries (LMICs) in order to incur benefits for both students and improve the quality of global health research. In addition to presenting a description of the DSCA, we discuss its alignment with the Core Competencies for Global Health Research and Practice and some key barriers, challenges and opportunities related to its implementation. Although this presentation of the DSCA is an entry-point to new possibilities for doctoral students, the approach will benefit from further refinement through feedback. We therefore call upon our colleagues, especially those in LMICs, to provide input regarding the opportunities and challenges of a DSCA in practice.

Introduction

Students from a variety of disciplines, institutions, educational backgrounds, geographic regions and cultures are being increasingly drawn to the field of global health. Among this diverse group of students are those enrolled in academic institutions in high-income countries (HICs) who have lived, worked, volunteered, conducted research in or travelled to low and middle-income countries (LMICs). Most of these students have been impacted by the experience of extreme global inequality and see themselves as playing some role in addressing these deep-rooted disparities in health determinants and outcomes.

We are writing this paper as two such global health students, both completing research-intensive doctoral degrees. We are Canadian citizens and based at the University of Toronto. Shaun Cleaver is conducting disability and rehabilitation PhD research in Zambia; Nadia Fazal is conducting peace and health PhD research in the Democratic Republic of the Congo.

While we understand the elusiveness of working towards sustainable change in global health, and the ease with which one can contribute to unintended consequences, we are confident that PhD students (and students in general) have a critical role to play in obtaining tangible and positive change on a local and global scale.

From this standpoint, we acknowledge that we have particular values and principles underlying our drive to pursue global health research. Additionally, we recognize the importance of articulating these values in order to ensure their application within our independent doctoral research studies. For these reasons, we have worked collaboratively to conceive an approach that we present here: A Doctoral Student Complementarity Approach (DSCA). We are proposing this approach because we see an important gap in what we have come to know and understand about the field of global health (see "our understanding of global health" below): while it is relatively straightforward and acceptable for us to travel from our high-income country to conduct research in low-income countries, it is not typically encouraged or required for us to connect and collaborate with students from the low-income countries we visit. We propose an explicitly named approach to that gap in order to emphasize the specific aspects of this idea that we are developing and refining. While this approach is focused at the level of the individual student, we foresee that it could ultimately facilitate partnerships between academic institutions and global health doctoral programs.

In presenting this approach, we are cognizant that we are doing so from our perspective as Canadian doctoral students conducting research in low-income countries: indeed, our positionality limits us in this way.[1] As such, the DSCA currently lacks the critical perspective of our specific colleagues in our countries of research, and from doctoral students in LMICs in general. Nonetheless, we have conceived this idea with a consideration of what we observe and understand our colleagues' needs to be, and we hope that this paper will initiate a discussion that attracts and engages these important stakeholders in the further development, revision and conceptualization of a more robust DSCA.

In this paper, we discuss global health as a field and our roles in it, to identify some important obstacles that need to be addressed in global health doctoral research. We then introduce the DSCA, by discussing its alignment with the Core Competencies in Global Health Practice and Research, before launching into the specifics of how this approach could be operationalized and the "intermediary outcomes" that may result from its implementation. Finally, we discuss foreseeable barriers, key opportunities and challenges to consider as we—and other doctoral students or doctoral programs—seek to practically apply a DSCA.

Global Health and Our Role as Doctoral Students

Our Understanding of Global Health

Global health—distinct from international health, public health and tropical medicine—has been defined in a number of ways in the related literature (namely: Koplan et al.[3] and Kickbush[4]). We recognize that the concept of global health research was developed in high-income countries and is a term most popular in North America and Europe. A given research project in a low- or middle-income country would likely be referred to as "health research" by a researcher from that country, while the very same project would be considered "global health research" by a visiting researcher from a high-income country. For the purposes of this paper, we will adopt Beaglehole and Bonita's definition of global health research as "collaborative transnational research and action for promoting health for all."[5] This definition highlights four key aspects that we believe to be critical in global health: collaboration, health equity, global health’s transnational nature and global health’s inextricable relationship with research and action.

Two frameworks that have been fundamental to our understanding and conceptualization of global health and global health research are the “political economy of health framework” and Bozorgmehr’s “concept of global health.”[6,7] Important in each of these frameworks is their emphasis on multi-level and multi-sectoral determinants of health. These determinants of health include considerations of the global political and economic context such as global governance structures, global markets, global communication and diffusion of information, global mobility, cross-cultural interaction, global environmental change, macro-economic policies, trade agreements and flows, intermediary global public goods and official development and debt relief. In addition, these determinants of health include those at national, organizational, workplace, community, household and individual levels.[6,7]

We have an understanding that global health research is grounded in values such as: health equity, social justice, health as a human right and a sensitivity to the history of international health.[8,9] Additionally, we are committed to the Core Competencies in Global Health Practice and Research.[2] Throughout this paper, we are guided by these foundational frameworks, concepts, definitions and values of global health as we seek to position ourselves within this field and to define our role within it.

> “... while it is relatively straightforward and acceptable for us to travel from our high-income country to conduct research in low-income countries, it is not typically encouraged or required for us to connect and collaborate with students from the low-income countries we visit.”

Our Role as Global Health Doctoral Students

Given the many layers of political, economic, cultural and social factors that influence global health, we see our role as global health doctoral students as multi-dimensional: through our independent research dissertations, we aim to understand broader structural-level change to existing international and national bodies, while also aiming to impact ‘on-the-ground’ changes at the individual, household, community, workplace and organizational levels. As “hopeful realists,” we acknowledge the many obstacles and challenges in obtaining global health goals, but are committed to moving forward in a positive direction toward affecting change on an international scale that we believe to be ethically imperative.[6]

Obstacles in Global Health Doctoral Research

There are many obstacles that prevent doctoral students globally from conducting useful, practical, ethical, culturally-relevant and sustainable global health research. For example, doctoral students from HICs conducting research in LMICs may lack a critical contextual and cultural understanding of the region where they are conducting their research. Additionally, due to structural factors in LMICs, there may be limited access to courses that address substantive and methodological developments. Further obstacles may include unequal access to resources for students in LMICs relative to students in HICs; inadequate funding opportunities; high tuition costs; short timeframes for “overseas” research data collection; language barriers; cultural differences;[9] lack of sustainable partnerships between LMIC and HIC academic institutions and graduate students;[10] and unequal publishing opportunities for students in LMICs relative to those in HICs.

A Doctoral Student Complementarity Approach (DSCA): Aligning with Core Competencies of Global Health Research and Practice

A Doctoral Student Complementarity Approach

Bearing in mind the obstacles in global health doctoral research, we propose the idea of a Doctoral Student Complementarity Approach. We refer to “complementarity” in this paper—defined as “a complementary relationship or situation”—as a synergistic process, whereby the coupling of complementary entities leads to a combined product of greater value than the sum of its individual entities.[11] By “coupling,” we are referring to an academic connection between two doctoral students that could be formal or informal. The coupling is voluntary, intentional and actively recognized by both students. When coupling is applied to the idea of doctoral students embarking upon global health research, we see this term as the process of coupling a doctoral student enrolled in an institution in a HIC with a student enrolled in an institution in a LMIC. For the purposes of a DSCA, the student from the LMIC should be living in, be studying in and be a national from the country where the doctoral student from the HIC plans to conduct their dissertation research. This coupling can be initiated by the students themselves and should benefit each of the students in their pursuits to produce research with both scientific rigor and maximum contextual relevance.

A DSCA implies an explicit and intentional dialogue between the two students. Since the students may be separated by distance for a large part of their programs, this dialogue will undoubtedly require communication technology such as email, telephone, social media and voice over Internet telephony (i.e. Skype). The specifics of the DSCA will depend greatly on the individual needs and priorities of the participating students as well as other external factors. Regardless, the essence of this approach is that the intentional exchange between them has the potential to change the perspectives of each and ultimately improve the overall quality of their independent research. Inevitably, a DSCA requires that both students share some common ground; their connection on this common ground must satisfy the respective interests that make the relationship meaningful to each.

Alignment with Core Competencies

In proposing the idea of a complementarity approach, we understand it to be fundamentally aligned with Core Competencies in Global Health Practice and Research.[2] In 2010, a diverse group of Canadian global public health stakeholders assembled to discuss the development of competencies applicable to global health research and practice[2] as extended from the Core Competencies for Public Health in Canada.[12] Through this process, the group developed 25 competencies that are applicable to global health research or practice.[2] Although we see all of these competencies as important, we have identified four groupings that are relevant to our discussion of a DSCA, identifying each of these groupings by one particular competency and incorporating other core competencies within the group. These groupings are a) knowledge relevance to users, b) identifying and collaborating with colleagues of different backgrounds, c) respect of cultural diversity and d) self-reflection on one’s own social location. Each of these, and their relationship to complementarity, will be discussed here.

a) Knowledge relevance to users. Doctoral student complementarity can create a shared space to better identify possible users of research. In turn, this could lead to projects that are designed to best meet these constituencies’ needs. This principle is particularly poignant for student researchers from HICs conducting research in LMICs where they are likely to be less familiar with the context, and stand to develop far more contextually relevant projects with the insight of a colleague from that nation.[13] At the same time, however, the relevance of research conducted by LMIC doctoral students in their own country could also be improved through a DSCA as local student researchers exchange ideas and perspectives with counterparts from HICs in order to improve the research conducted in their local setting.[14] Through this exchange the doctoral students from LMICs could benefit from this ongoing research-specific dialogue. Furthermore, students from LMICs could tap into additional resources, to which students from HICs might have access, for theoretical or methodological purposes.

Intrinsically tied to the issue of relevance are the mechanisms through which global health research fulfills its purpose of "being translated into solutions that address real-world problems."[9] These mechanisms are reflected in the competencies, addressing the need for research results to inform advocacy activities, as well as "community action, program management and policy-making."[2] Moreover, these issues are best addressed when incorporated into the research plans with consideration of how the knowledge discovered (or created) is then put into use. Through complementary relationships, doctoral students are thus able to inspire and challenge each other to develop and conduct research that effectively achieves change through its intended actions, as is demanded by the Core Competencies in Global Health Practice and Research.[2]

b) Identifying and collaborating with colleagues of different backgrounds (i.e., cultural and disciplinary). The key principle of complementarity is connection between doctoral students from different countries, a principle that almost automatically satisfies the demand that researchers reach out to colleagues from different cultures. It should be noted, however, that among scholars the most relevant strands of "culture" may not be ethnically, linguistically or nationally based: in discussing an established and successful partnership between Canadian and Burkinabe researchers, Ridde et al.15 note that cultural clashes due to academic discipline were more challenging to manage than those of national origin. This finding further supports the prerogative that stimulating collaborations should be transdisciplinary as well as transnational.[16]

An additional two proposed competencies are related to communication and dialogue across cultures, disciplines and jurisdictions. Consistent with these competencies, a complementary relationship requires that doctoral students engage in communication with others from different backgrounds, an exercise that allows the doctoral students to better appreciate other styles of communication and improve their own proficiency in communicating in these styles at an important stage in their skills development. This learning through practice can also be supplemented by the insight of doctoral students of different backgrounds in suggesting communication strategies that are more likely to resonate with important audiences that foreign doctoral student researchers may be less likely to connect with independently.

c) Respect of cultural diversity. A DSCA can encourage the recognition and incorporation of multiple cultural views through its processes of linking doctoral students from different cultural backgrounds. As this competency relates directly to global health research and interventions, a DSCA creates a forum between doctoral students to discuss their respective preferences and priorities and expose one another to the lenses of a colleague from a diverse cultural background.[2] In this process of exposing and sharing, the complementary doctoral students are in a position to better understand other cultures and further make their research contextually relevant.

d) Self-reflection on one's own social location. Similar to its respect of diversity, a DSCA challenges one's view by creating a relationship where parties are forced to come to terms with the different social locations of a colleague. By social location we are referring to the position that a person finds her/himself in relative to others. Social location is influenced by not only the identities that are claimed or ascribed to a person, such as age, gender, race, sexuality, nationality, etc., but also roles. One's social location impacts their worldview and the opportunities available to them. It should be noted that the doctoral students could share similar positions in some respects (that each is a well-educated student researcher in his/her respective country), but markedly different locations in other important ways. One important difference in a DSCA relationship could be due to access to economic resources or LMIC-HIC power dynamics. Nevertheless, social locations are the product of intersections, such that nationality is only one element of a social location. Furthermore, nationality is not deterministic: just because high-income countries are wealthier than low-income countries does not mean that all citizens in HICs are wealthier than citizens of LMICs. In fact, we have seen from our experiences that PhD students in LMICs typically fall in the higher socio-economic status bracket of their countries, whereas we have not observed this same phenomenon for PhD students in HICs. Nonetheless, when discussed with mutual respect and open communication, the contrasting elements of a colleague's social location can provide doctoral students a lens through which to better understand that their social location is indeed merely one location among many and allow individuals to become more aware of how this location relates to that of others.

Envisioning a Doctoral Student Complementarity Approach

Given this understanding of how the proposed DSCA relates to the Core Competencies in Global Health Practice and Research, we present an overview of how this approach could be applied practically. Most doctoral programs follow a similar series of stages, including 1) Course selection; 2) Committee member selection; 3) Comprehensive examination; 4) Research proposal and study design; 5) Ethics proposal; 6) Data collection; 7) Data analysis; 8) Dissertation write-up and 9) Knowledge transfer/exchange. Although we recognize that there are variations to these stages and their order in individual doctoral programs, this prototypical series is useful to describe the relevance of the DSCA as the students move through their programs. Here, we first describe the relevance of the DSCA for each stage of a typical doctoral program, and in the following section we will identify the potential "intermediary outcomes" that can result from its application at each stage.

1) Coursework. While doctoral programs are designed to allow students to pursue independent research projects, some academic institutions may require doctoral students to complete courses before proceeding to engage in their own independent research.[17] While some courses may be mandatory for the particular program of study, it is possible that students at this stage are able to choose among a selection of elective courses offered within their academic institution. A DSCA can influence course selection and involvement through the support and advice that each student offers the other.

2) Committee member selection. Doctoral students are often responsible for selecting their own dissertation committee members. Students may be influenced by a variety of factors when making these decisions. A DSCA can facilitate the selection of an international committee member for either student involved. Moreover, even if students do not seek international committee members, the perspective offered through a DSCA could influence the students' selections of committee members in their own institutions.

3) Comprehensive examination. In some academic institutions, it is mandatory that doctoral students complete a comprehensive examination before engaging in their independent research study. The examination is typically either one (or more) invigilated written exam(s), or one (or more) paper(s) written independently by the student over a limited period of time. In some institutions, there is also an oral component where the student must orally defend the written component of his/her examination. Since comprehensive exams entail an extensive consideration of knowledge and ideas, the DSCA can motivate students to use the stimulation of this process in order to further develop ideas and co-publish.

4) Research proposal and study design. Every doctoral student needs to develop a specific research proposal outlining their precise study design. While some institutions ask for this to be completed upon the application of the graduate student for the doctoral program, others require the student to develop this proposal during the doctoral program itself. A DSCA can influence this stage of the doctoral research process in important ways, as the students involved conceptualize their research plans and consider their respective access to resources.

5) Ethics proposal. When conducting research with human participants, undergoing ethics review is a standard process in most countries and academic institutions. Sometimes, however, there is no robust or discipline-appropriate research ethics board (REB) in place and the ethical aspects of the research study may go unchallenged. This stated, even when there are strong and appropriate REBs, distance and a lack of familiarity with the board could complicate the submission process for students from abroad. Involvement with a DSCA can lead to more ethical research practices, logistically-facilitated REB submissions and the possibility of strengthening REB structures.

6) Data collection. Most doctoral students are required to collect data for their independent research studies. This stage is often an expectation of doctoral programs worldwide. A DSCA can lead to more access to resources and more rigorous research.

7) Data analysis. All doctoral students are required to analyze the data that they have collected for their independent research studies. Engaging in a DSCA can lead to important insight, access to resources and more rigorous research.

8) Dissertation write-up. Once the data analysis stage is complete, the doctoral student is required to write-up their findings in the format of a final thesis dissertation. Although the format and requirements for each of these final dissertations may vary, this stage is present in all doctoral programs worldwide. A DSCA can lead to better access to resources, increased research output and a higher level of rigor at this stage.

9) Knowledge transfer/exchange. It is critical that a doctoral student's research findings are shared with the relevant stakeholders of their particular research project. While this is listed as the final component of the doctoral process, we acknowledge that this stage is not always mandatory for doctoral students; additionally, we would argue that this stage should occur as an ongoing process throughout the entire research study. Through a DSCA it is possible for students to better connect with various types of audiences in the country of the research as well as international audiences.

The "Intermediary Outcomes" of a Doctoral Student Complementarity Approach

The ultimate intended outcome of a DSCA is global health research that is more useful, practical, ethical, culturally relevant and sustainable. "Intermediary outcomes" are positive changes that occur through a DSCA that are on the pathway to achieving the ultimate intended outcome(s). The "intermediary outcomes" that may result from implementing a DSCA at each of the doctoral program stages include contextualized thinking, institutional change, international learning, increased contextual relevance of research, increased access to resources; more rigorous research, co-publication, more ethically sound research practices, international sharing of research findings and reaching audiences outside the academic institution.

Many of the "intermediary outcomes" are asymmetrical in the sense that the benefits are more easily foreseen for either the student from the HIC or the student from the LMIC. In order to describe these benefits more specifically, we will refer to two hypothetical doctoral students who are coupled through a DSCA. Paul is a man studying at a university in a low-income country and completing his dissertation research in that same country. Laura is a woman studying at a university in a high-income country who is completing her research in Paul's country.

Contextualized thinking. Laura's increased understanding about her research context (as provided by the perspective of Paul) can influence Laura in her course selection (topic-, method- or theory-related), and the way in which the findings are understood and written up. This intermediary outcome is most applicable to Laura's research since she is less familiar with the context.

Institutional change. Either student has the opportunity to gain an increased understanding of the kinds of methods and theories that are being taught in relation to their research interests at another academic institution that is contextually very different from their own. With this broader outlook, either student can more actively seek out professors within their academic institution who are knowledgeable in these particular areas, and encourage them to offer graduate level courses in these areas if they are not already being offered. Additionally, in cases where the research ethics board (REB) is weak or absent, dialogue between the students can help Paul or Laura challenge the professors and leaders within his or her academic institution to develop a rigorous research ethics board, or to strengthen the one that is currently in place.

International learning. There is potential for this approach to lead to some level of involvement for Paul, as well as his colleagues and professors, in Laura's courses, or vice versa. This involvement could be facilitated via interactive technological platforms such as Skype and include components such as virtual guest lectures and international student discussions.

Increased contextual relevance of research. For Laura, a committee member from Paul's academic institution could be extremely beneficial in guiding her doctoral process and ensuring that it is contextually relevant during all stages. As part of a DSCA, Paul could provide background information on faculty members in order to help Laura contact potential committee members that are of better fit and congruence to her plans. The stronger student-advisor relationship allowed by this better fit could further strengthen the contextual relevance.

Furthermore, through a DSCA, Laura's increased understanding about the regional context where she will be pursuing her research (from Paul) could dramatically shift the way in which this research proposal is written, the practical process of data collection (as contextually relevant obstacles of Laura's research could be flagged by Paul) and the ways in which the data is analyzed and written up.

Increased access to resources. For Paul, involving a committee member from Laura's academic institution could help to provide increased expertise, credibility and resources throughout his PhD program. Additionally, Laura may be able to share resources related to the theories, methods, topic area, data collection, data analysis and final write-up of Paul's research. These resources could influence the degree of rigor in Paul's research proposal. Although it is true that the improved access could also occur in the opposite direction (i.e. a committee member from Paul's institution providing increased expertise, credibility and resources to Laura, or Paul providing resources to Laura), we propose that this intermediary outcome will more often be of primary benefit to Paul. We see this asymmetry to be the product of a global structure where universities in HICs are better resourced and have better reputations than those in LMICs. This resource imbalance then leads to increased capacity and specialization in HIC universities, while the reputation imbalance leads to increased credibility. We recognize that this general pattern does not apply to every specific university in either HICs or LMICs, nor does it apply to every pair of students; there could be instances where the asymmetry operates in the reverse of the general pattern.

More rigorous research. For both Paul and Laura, involving a committee member from the other student's academic institution, who is a trained expert in the student's research area, could help to improve the overall level of rigor of the student's research study. Additionally, discussing and reflecting upon the benefits and challenges of their respective research projects through a DSCA could help to improve the overall level of rigor of both students' studies at the stages of research proposal and study design, data collection, data analysis and dissertation write-up.

Co-publication. A complementarity approach could lead to a co-publication between Paul and Laura. Given that both students will become "experts" on the content and findings of their respective doctoral dissertations, the differences and similarities between these dissertations will become increasingly apparent as both of the students progress within their respective programs. Via ongoing dialogue, it may be possible for these students to write and publish a paper together about the ways in which their research findings intersect. This could help provide the academic community with a broader perspective about the ways in which their independent research phenomena are connected in a broader context. Although we see this as a particularly plausible outcome at the "comprehensive examination stage" and the "dissertation write-up stage," the sharing of ideas leading to co-publication is really possible at any point in the DSCA students' collective journey.

More ethically sound research practices. Paul can offer Laura an increased understanding of what might be relevant to include

Doctoral Program Stage	'Intermediary Outcomes' of a DSCA	Potentially Desirable Characteristics of Students[†] or Relationship	Relation to Global Health Core Competencies[‡]
1. Coursework	*Contextualized thinking*	- Foresight about what courses could be most useful at an early stage in the program.	a, c, d
	Institutional change	- Willingness of both students to seek out and share resources. - An interest by either student to ask questions and challenge the material presented by the other student. - Perseverance and advocacy by the students to pursue change.	b, c
	International learning	- Planning, scheduling and technological skills in both students.	b
2. Committee member selection	*Increased contextual relevance of research*	- Paul has a good awareness of the faculty in the LMIC institution. - Diplomacy, strategy and perseverance of Laura to promote a dynamic in which the HIC institution, and its committee members, accept the status and expertise of the LMIC committee member.	a, b, c
	Increased access to resources	- Laura has a good awareness of faculty in her institution.	b
	More rigorous research	- Students have a good awareness of faculty in their institutions. - Students have access to knowledgeable and highly qualified professors within their respective academic institutions.	a, b, c
3. Comprehensive examination	*Co-publication*	- Creativity on the part of both students to see the areas of connection or divergence in their respective work. - Diligence and time to complete an extra-curricular initiative. - Clarity in communication and leadership on the part of both students in order to divide responsibilities and remain focused.	b
4. Research proposal and study design	*Increased contextual relevance of research*	- Uninhibited and flowing communication that allows Laura to share her plans, and Paul to critique these plans.	a, c, d
	Increased access to resources	- Paul is able to conceptualize what resources are needed. - Laura is resourceful.	b
	More rigorous research	- Students are able to be open and honest about the challenges and struggles that they are facing at this stage. - Students are able to be reflective and explicit about the perspective that they bring to their research proposal and study design.	a, b, c, d
5. Ethics proposal	*More ethically sound research practices*	- Paul is aware of community and institutional ethical norms and concerns. - Paul has sound understanding of local ethical principles and processes in order to best identify useful or harmful aspects of HIC ethics.	a, c, d
	Institutional change	- Students have a sound understanding of ethical principles and processes. - Perseverance and advocacy by the students to pursue change.	b
6. Data collection	*Increased contextual relevance of research, more ethically sound research practices*	- Paul has good awareness of data collection challenges.	a, c, d
	Increased access to resources	- Laura uses her resources efficiently and creatively to ensure that there are sufficient resources remaining to contribute to Paul's work.	b.
	More rigorous research	- Students are able to be open and honest about the challenges and struggles that they are facing at this stage.	a, b, c, d
7. Data analysis	*Increased contextual relevance of research*	- Paul is indeed aware of and respectful of the context and culture of interest, which could potentially not be the case if Laura's research is conducted with a subaltern group while Paul is a member of a dominant group.	a, c, d
	Increased access to resources	- Laura uses her resources efficiently and creatively to ensure that there are sufficient resources remaining to contribute to Paul's work.	b
	More rigorous research	- Students are able to be open and honest about the challenges and struggles that they are facing at this stage.	a, b, c, d
8. Dissertation write-up	*Contextualized thinking and more ethically sound research practices*	- Paul has good awareness of the nuances and context relevant for Laura.	a, c, d
	Co-publication	- Creativity on the part of both students to see the areas of connection or divergence in their respective work - Diligence and time to complete an extra-curricular initiative. - Clarity in communication and leadership on the part of both students in order to divide responsibilities and remain focused.	b
	Increased access to resources	- Laura uses her resources efficiently and creatively to ensure that there are sufficient resources remaining to contribute to Paul's work.	b
	More rigorous research	- Students are able to be open and honest about the challenges and struggles that they are facing at this stage.	a, b, c, d
9. Knowledge transfer/exchange	*International sharing of research findings*	-Collaboration and inter-cultural understanding on the part of both students to ensure that the presentations are relevant and clear to the audiences at the counterpart institutions.	a, b, c

Table 1: Connections between DSCA elements
The hypothetical students are Paul (a man from a LMIC) and Laura (a woman from a HIC)
Global Health Core Competencies include: a) Knowledge relevance to users; b) Identifying and collaborating with colleagues of different backgrounds; c) Respect of cultural diversity; and d) Self-reflection on one's own social location.

in an ethics proposal for their specific research setting. This perspective can be useful for Laura to best consider locally appropriate ethical principles both when submitting to the REB at her home institution, and in the country of research (if local submission is possible). Additionally, the ongoing relationship between these two students could help Laura to appropriately navigate contextual, cultural and ethical issues that might arise during the data collection process and other doctoral research stages.

International sharing of research findings. Paul can present his research to Laura and her associated academic institution, and vice versa. This can be done via technological platforms or in-person, depending on the funds available and other barriers that may exist.

Reaching audiences outside of the institution. Paul can provide Laura with insight to help identify the audiences where the research findings can have the greatest impact. These audiences could be specific decision-makers or simply be affected communities. Additionally, Paul can help Laura craft her message in order for it to retain its meaning while being optimally understood by the audience. Conversely, Laura could provide strategies and tact to help Paul reach international audiences such as HIC administrations and funders.

Connecting the Stages and "Intermediary Outcomes" to Desirable Characteristics

We foresee improved possibilities for success if the participating students or the DSCA relationship has certain desirable characteristics. In Table 1 (see Appendix) we present these desirable characteristics and outline the connections between them, the prototypical stages, the "intermediary outcomes," and the Core Competencies in Global Health Practice and Research.

Barriers, Key Opportunities and Challenges

Existing structures create numerous barriers that could preempt the implementation of the proposed DCSA. Nonetheless, these same structures can facilitate certain key opportunities for success. Students pursuing a DSCA should foresee barriers and tackle them in advance. In some cases, it might be necessary to instead highlight the key opportunities, to show that the value of a DSCA outweighs the concerns that are presented as barriers. In addition to overcoming barriers and maximizing key opportunities, we also recognize that there are important challenges that could arise in the practice of a DSCA. Although a barrier could impede a student from ever engaging in a DSCA in the first place, a challenge could stop a DSCA from being successful according to the goals that the students seek to achieve. Here, we discuss some of these barriers, key opportunities and challenges that relate to the DSCA.

Barriers

Although we recognize that institutional firewalls (i.e., regulatory structures such as memoranda of understanding, terms of reference or departmental approval) can often be useful for some important purposes,[18] we do not see these types of bureaucratic or formal agreements as necessary for all styles and levels of engagement that could be pursued using a DSCA. Conversely, we can see instances where their presence or absence could impede complementary relationships.

The absence of regulation could be a problem when at least one of the doctoral students is housed in an institution that prohibits inter-institutional engagement without the prior development of signed agreements. This is despite many possible complementarity arrangements being of a very different nature than the partnerships for which such processes are truly intended. This possibility seems more likely in institutions with particularly hierarchical structures in which authorization from supervisors is required for all external communication. In such a case, the time and effort needed to respond to bureaucratic requirements might be incommensurate with the early and exploratory phases of a complementary relationship.

At the other end of the spectrum, existing regulatory structures may oblige the complementary doctoral student parties to review a series of documents and prioritize the alignment of their relationship with the established terms of reference instead of simply pursuing areas of mutual interest and connection that are relevant to their research. Furthermore, regulatory structures could influence activities beyond collaborative arrangements between students; for example, the process of securing an appointment to be a committee member in another institution can often be rather involved and lengthy, serving as an institutional firewall that impedes students' capacities to secure committee members across borders. Along these lines, faculty appointments may not be crafted in ways that allow a potential committee member to supervise students from another institution.

In order to overcome potential regulatory structures that serve as institutional firewalls, we encourage doctoral students to be aware of their institutions' existing norms and expectations as they approach complementary relationships. Such awareness can allow students to recognize the purposes of structures in order to most efficiently work within the expectations when appropriate, or challenge the expectations when they are an impediment. Ideally, awareness of the existing or expected regulatory structures could lead to the doctoral student encouraging a positive change, preserving the useful intentions of the regulatory structures, but improving their relevance and flexibility.

In addition, complementarity could be viewed as competition by existing relationships. This situation would occur when the students interested in pursuing a DSCA are from the many universities outside of established institutional relationships rather than the few that are inside. To the credit of the global health research field, supportive relationships between institutions are a common arrangement. Such arrangements are particularly prevalent for doctoral programs in LMICs that are often offered in "joint" or "sandwich" formats in partnership with institutions in HICs.[19] In cases of pre-existing relationships, it is entirely conceivable that the partner institutions are reticent to allow their students to engage in collaborative activities with a colleague from an outside university. In well-intentioned cases this reticence could stem from concerns about the student's schedule and availability, or that additional connections could weaken the existing arrangement. In other cases, the restrictions on a doctoral student could be due to reasons for exclusivity that are more intentional, such as the phenomenon of partnerships created for competitive advantage, with the distinct objective of limiting opportunities for rival institutions.[20] Regardless of the underlying currents of an existing relationship, doctoral students who are affiliated with partnership programs or departments in partnerships should be aware of the implications that this can have on complementary relationships with student colleagues from other institutions, and proceed accordingly.

The absence of initial connections between doctoral students could create a barrier to the development of a DSCA. According to the structures in place for global health research, the current default is for doctoral students from different institutions conducting similar research in similar locations to operate in parallel without connecting with one another. With a lack of structures to connect doctoral students, we suggest that global health doctoral students make a conscious effort to identify counterparts and reach out to them. Referring to the example of Laura and Paul, we argue that this responsibility resides primarily with Laura since she is actively deciding to engage in research in Paul's local environment/context, and we would suggest that this student (i.e. Laura) should visit and engage with local universities respectfully and appropriately.

Language differences could also be a barrier to student connection leading to a DSCA, particularly when otherwise complementary doctoral students do not share a lingua franca. Accordingly, reduced fluency on behalf of one of the counterparts in the language in which they choose to communicate can limit the extent of dialogue between the two. Even in instances where complementary doctoral students share a common language and comfortable fluency, the advantages of a DSCA could be limited if one student is unable to communicate in the language of operation of the other's institution. When language barriers are present between a visiting doctoral student researcher from a HIC and a local doctoral student researcher in their own country, we see the responsibility to overcome the barrier as resting primarily with the visitor. We concede that attaining fluency in one of the languages of the country in which they are working could be a challenge for the student from a HIC, but encourage all visitors to engage in some learning. For some, this might require devoting time to intensive language study. For many others, it could involve learning key phrases or hiring a paid interpreter to increase the opportunity for communication on more local terms.

Insufficient resources can also be a barrier for students to engage in a DSCA. Employing a DSCA requires a time commitment, since it involves additional activities as compared to those typically expected over the course of a doctoral program. Additionally, making time to connect when students are in different time zones may pose further challenges. Some doctoral students have schedules in which the time devoted to academic activities is limited by outside employment used to cover living expenses. In order to overcome these challenges, better funding for global health doctoral students could allow these students to engage in DSCA activities in ways that do not currently occur. Furthermore, long-distance communication generally has an associated monetary cost, which could be a barrier to the adoption of a DSCA. The availability of funding to cover communication costs could therefore be an important catalyst to ensure that complementary students capitalize on available communication opportunities.

Key Opportunities

The combined efforts that occur through a DSCA can trigger various mechanisms to create an increase in research production and dissemination. Ultimately, this can result in more publications, reports and presentations. The mechanisms that can create an increase in research production and dissemination include a sense of shared responsibility and motivation, and an idea pool that allows for increased creativity and a more thorough and reflective grasp of both literature and lived experiences.

More specifically, sharing ideas and collaborating with colleagues creates an additional forum to engage with the research material, keeping the process more interesting and allowing reflections that might not be possible with the doctoral students' existing web of contacts. This pool of ideas allows for the emergence and development of more creative solutions than what is possible with individuals working alone. It also allows the collective circulation of a larger pool of research findings and lived experiences and the interpretation and discussion of this information from multiple perspectives. In this way we see a DSCA as having the potential to allow participating doctoral students to expand the depth and breadth of their theses, and also engage in side projects as time permits. The result of this collaboration/exchange would be that the participating students conduct more research.

Similar to the way in which some PhD students have found community engagement to be a motivating factor to stay on track in doctoral studies,21 we also suspect that the expectations of doctoral student colleagues will strengthen the motivation of the individual partners to carry research efforts through to completed and actionable products. Additionally, having collaborators can mean that participating students work together to publish, present or create knowledge translation tools. The sum effect of these elements is the potential to have "more actionable products per unit of research," an important benefit of a DSCA.

Involvement in a DSCA among students can create an increase in inter-institutional partnership potential. Global health actors understand partnerships as arrangements that can improve research quality, knowledge exchange and develop research capacity, making partnerships a generally positive connection between institutions.[18] Doctoral student complementarity can reinforce existing institution-level partnerships by adding another point of connection to increase the partnership's activity or by establishing relationships that could lead to new partnerships.[9] In addition to the numerous benefits available to doctoral students as individuals, interested candidates should remember the potential institution-level benefits as well when considering whether a DSCA is a productive use of time, or when justifying the utility of the activity to colleagues.

As compared to established academics, doctoral students are in some ways in an advantageous position to conduct global health research.[9] For example, doctoral students do not face the pressures of securing tenure, allowing the freedom to be more creative and allocate more time to their research, which in turn permits a more nuanced approach to their particular research endeavours.[9] Additionally, doctoral students have an extended period of time (approximately three to five years depending on the academic institution) to focus exclusively and comprehensively on their particular research goals and interests; they are able to engage deeply with the related literature, discuss their ideas with relevant top scholars and experts and interpret and disseminate our findings with the guidance of academic supervisors and dissertation committee members.[9] Some of the positional advantages of doctoral students to global health research in general are particularly suited to complementarity. For example, the flexibility mentioned above also allows more time to be actively devoted to building and nurturing networks and partnerships, a luxury not as readily available to new faculty members.[22] Accordingly, the doctoral studies phase of one's career can be an opportune time to develop relations that are drawn upon later.

Challenges

Despite good intentions, the persistence of power dynamics in the larger world could lead to unequal benefits from a DSCA. We have conceived of the idea of the DSCA from our perspective as Canadian-based global health students. Beyond the obvious benefits that we see for ourselves in engaging in a DSCA, we want to ensure that this approach would be equally as beneficial for students enrolled in academic institutions in LMICs. Unfortunately, as students from Canada, it is not entirely possible for us to determine what the most valuable or most plausible benefits would be for our complementary doctoral students from LMICs. For this reason, we hope to engage doctoral students from LMICs in the development of this idea and be ready to yield to their priorities while maintaining the values that attracted us to this idea in the first place. In the meantime, it is our responsibility to remember the temptation and ease of Northern partners to reproduce colonial legacies through inequitable global health research partnerships, and actively counter this possibility.[23,24]

Indeed, the situation of doctoral students in LMICs could make complementary relationships either highly beneficial or only marginally so, and there are implications at both ends of this spectrum. According to the experiences recounted by Walker et al. from a group of doctoral students from LMICs teamed with Canadian counterparts, there were "concerns about [a] lack of academic resources, training opportunities and funding."[9] This position of vulnerability relative to Canadian students, who possess relatively abundant resources and opportunities, could lead doctoral students from LMICs to engage in complementary relationships at the weaker end of a significant power differential. In this situation, it is possible that students from LMICs engage in a DSCA under terms that are not fair, because they are hoping to access important benefits through the relationship.[25] Conversely, should the benefits for doctoral students from LMICs be negligible, there could be a desire to complement Canadian students out of obligation as good hosts or pressures from academic superiors hoping to curry the favor of the Canadian institution. In this case, a miscommunication or unequal power dynamic could lead to a relationship that is exploitative from the perspective of the doctoral student from the LMIC.

Beyond the issues stated above, there is the possibility for a misunderstanding between parties. Doctoral students engaging in a DSCA will undoubtedly do so with at least some pre-conceived ideas in mind and a particular vision about what could constitute a positive relationship. If these ideas are not clearly communicated from very early in the process, there could be substantial possibilities that the DSCA be founded on expectations that are unrealistic or undesirable to the student counterpart. Additionally, there could be disputes about authorship or ownership of the products of doctoral student complementarity. For this reason, we support a commitment to "open, frank discussion" between complementary doctoral students as an initial step in a DSCA. Specific tools or agreements can facilitate this process, although they will not always be necessary.[18] We recommend the consideration of tools that encourage constructive discussion without being unnecessarily onerous. An example of this is the Canadian Coalition for Global Health Research's Partnership Assessment Tool, which is designed to be flexible and could be appropriate to many types of complementary relationships.[18]

Conclusion and Next Steps

With a consideration of the barriers, key opportunities and challenges of the proposed DSCA, we hope that global health doctoral students will consider this approach and its application to their independent doctoral research studies. We see the DSCA to be in line with the values and principles that drive us in our pursuit of global health research, as well as with the Core Competencies in Global Health Practice and Research.[2] We anticipate that our proposed approach, at the very least, will serve as a starting point for global health doctoral students from HICs and LMICs to think about the importance of engaging in an ongoing inter-cultural, inter-disciplinary and international dialogue related to their respective research throughout their doctoral studies.

As students from a HIC conducting research in LMICs, we are able to foresee certain benefits of DSCA arrangements. Our colleagues from LMICs might see these differently. For this reason, we especially call on doctoral students from LMICs to bring forth their perspectives about the potential opportunities and the possible perils of a DSCA in practice.

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A Scoping Literature Review of Work-Related Musculoskeletal Disorders Among South Asian Immigrant Women in Canada

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Global migration has recently garnered intense interest from a public health standpoint. Topics concerning migration, such as push-pull theories, resettlement stress, the healthy immigrant effect, cultural assimilation, and occupational health issues, are increasingly being studied. The occupational health of migrant workers—particularly female workers—is an especially important area for research. Migrant women have an increased vulnerability to occupational musculoskeletal disorders (MSDs) in low-paid and gendered occupations such as those in the textile, hairdressing, cleaning and garment-work industries, accompanied by mental stress due to production demands.[1] One of the fastest growing communities in Canada is that of female migrants from South Asian (SA) countries, comprised of Pakistan, Bangladesh, Sri Lanka, India and Nepal.

The purpose of this paper is to examine the literature concerning work-related musculoskeletal disorders among South Asian immigrant women in Canada. We have focused on SAs because they make up the largest visible minority group since 2006, with a population of 3.2 to 4.1 million people within Canada. This group is expected to remain the largest set of visible minorities until 2031.[4] This study defines Canadian visible minorities as persons who are non-Aboriginal, non-Caucasian or non-white in color. This includes such ethnicities as South Asian, Chinese, Black, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese and Korean.[5] As the SA population continues to expand, more SA individuals are expected to enter the workforce and may experience occupational health disparities. If these individuals are at a high risk for MSDs, introducing appropriate interventions could minimize health problems, and reduce the burden of health and disability in this largest visible minority group. A literature review could help assess whether or not a large scale study is necessary on this topic.

Guided by Arksey and O'Malley's framework,[6] a scoping review of peer-reviewed literature was carried out using the following databases: Medline (Ovid), CINAHL (Ebsco) and Scholars Portal. Search years ranged from 2000 to 2014. Articles were screened for relevance by topic. Following this strategy, manual search of gray literature was employed, such as searching reference lists from scholarly papers, and textbooks on women's occupational health. Results were limited to articles in the English language, excluded dissertations, conferences and studies involving undocumented migrants, the latter being excluded because they are not permanent economic migrants. Including them would be outside of the scope of this study.

Thirteen sources were retrieved and analyzed for this paper. After assessing the sources for relevancy to the topic, issues and gaps in knowledge, pertaining to non-reporting of MSDs, socioeconomic class effects, high-risk occupations and cultural factors as modulators and determinants of the occupational health of immigrant women—including SA immigrant women—were identified. Although most studies of immigrant workers incorporate SA populations, they are not comprehensive in their focus on this group. There is a lack of significant literature that explicitly examines the prevalence of MSDs among SA immigrant women in Canada was identified. This knowledge gap can be explored and filled in future studies.

Introduction

The healthy immigrant effect is the assumption that immigrants are typically healthy on arrival because of careful selection and medical screening that disqualifies those with serious illness. However, there is a caveat; the longer they reside in their new host countries, the more their health deteriorates and converges with that of the native-born population.[7,8,9] Behavioral, social, political and cultural factors, including poor dietary habits, smoking/drinking, lowered socioeconomic status, loss of social networks, poor working conditions, language barriers and inadequate access to healthcare provisions seem to be causes of this decline.[3] The occupational health of migrant workers, particularly migrant women, is an important area for research that could add to knowledge of the healthy immigrant effect, especially because women tend to hold precarious forms of work while participating in paid and unpaid duties simultaneously.

Musculoskeletal disorders (MSDs) are defined as disorders affecting the muscles and joints, including back pain, repetitive strain injuries, spinal disorders, sprains, dislocations and fractures. According to a 2003 World Health Organization (WHO) report,[10] they are among the many types of occupational health hazards—such as biological, chemical, physical, ergonomic, or psychosocial—affecting migrant workers.[11] MSDs are one of the most prevalent and chronic conditions in Canada, with 43% having reported having an MSD.[11] MSDs also have a detrimental cost to the Canadian economy, estimated at $37 billion each year due to disease and injury.[12] These costs stem from hospital care, physician visits, rehabilitation and prescription drugs, but nearly 75% of the overall costs are indirect and due to absence from work, lost potential earnings and underperformance.[12,13] According to Canada's provincial worker compensation boards, MSDs were also the single largest category of lost-time injury claims—work-related absences due to injury or illness—in Canada.[14,15]

The risk of occupational injuries and MSDs seems to be compounded in many immigrants, especially immigrant women. A possible reason for their vulnerability to occupational injuries and MSDs is due to deskilling: their previous skills and experiences are not recognized in the labour market, as a result they take up new jobs that that do not match their previous skills and experiences. Migration makes immigrants vulnerable to work-related accidents and illnesses because they are involved in increasingly precarious forms of work, such as part-time, seasonal or casual work (which refer to working less than 40 hours per week, working in particular seasons, or working on an on-call basis).[2,10,16,17] Among migrant women, these occupational problems are possibly exacerbated by the multiple burdens of paid work and unpaid domestic responsibilities coupled with deskilling and precariousness. While women in the native population may experience either paid or unpaid demands, they are not exposed to the same precarious working conditions as are migrant women.[16]

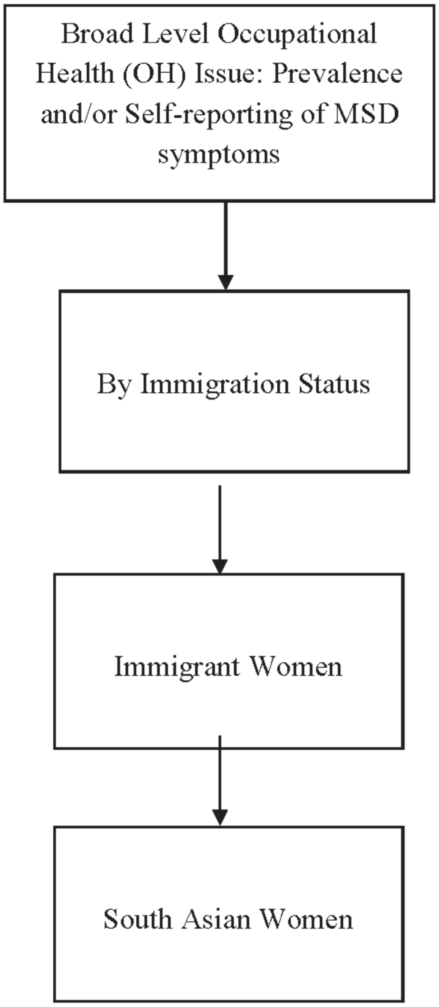


Figure 1: Diagram indicating focus of this review

Based on recent reports, the incidence and consequence of MSDs vary by gender. Evidence shows that work-related repetitive strain injuries such as tendonitis, Carpal tunnel syndrome and other upper-extremity MSDs are more frequent among women than men.[18,19,20,21] MSD prevalence has been reported to be higher among female employees than male employees in rubber manufacturing and assembly plants,[28] sewing machine operations[29] and newspaper offices.[14] Traditionally, the reason for women's vulnerability to MSDs has been predominately explained through a biological paradigm that assumes women are smaller in size and weaker than men. However, growing evidence suggests that women's vulnerability to MSDs is beyond simple biological differences between men and women.[30,31] Rather, these differences might actually be due to both the double burden of paid and unpaid domestic responsibilities that women experience and the feminization of certain forms work, such as services sector work, in which more women participate than men.[32] For example, 62.1% of workers employed in community, business and personal services are women.[33]

The rationale for studying the occupational health of migrant people—and migrant women—is that they experience multi-level disparities in the workplace. In general, racialized peoples or visible minorities and migrants have precarious work statuses; experience discrimination in jobs, pay and promotions.[34,35] Minority immigrants also earn lower incomes compared to non-racialized and non-immigrant groups. Many immigrants switch to new and unfamiliar occupations, or work in areas that are repetitive and manual, such as garment work, which may unintentionally increase their risk of injuries.[37] Some migrant women might be vulnerable to MSDs, and experience them differently than migrant men due to the multiple burdens of paid work and unpaid domestic responsibilities coupled with deskilling and work precariousness. Accordingly, a comprehensive understanding of MSD injuries among vulnerable groups, such as SA immigrant women, is needed. If these individuals are at a higher risk of MSDs, then targeting this population, promoting workplace health, and/or introducing appropriate interventions in this group would be beneficial.

Studying the prevalence and experiences of MSDs or related symptoms among South Asian (SA) immigrant women is important due to population demographics, economic impact, and the potential for SA women's vulnerability to MSDs. SAs form the fastest growing Asian group in Canada and the largest visible minority (i.e. racialized, non-white) group since 2006.[2,4,5] This group is expected to remain the largest set of visible minorities until 2031, estimated to be between 3.2 to 4.1 million people, with the rest of Canada's population at 31.2 million.[4] As the SA population continues to expand, more individuals are expected to enter the workforce, impacting and contributing to the state economy. Considering the growing population diversity in the global north, and especially in Canada due to the arrival of nearly a quarter million migrants each year, this is an important public health issue to examine.[2,38] The purpose of this paper is to examine the existing literature regarding work-related musculoskeletal disorders among South Asian (SA) immigrant women in Canada and identify knowledge gaps (Figure 1). For the purpose of this paper, SA immigrants are defined as those individuals whose place of birth was from Pakistan, India, Bangladesh, Sri Lanka or Nepal.

We focus on Canada because of high rates of migration and because of its health and worker compensation systems. Canada has one of the highest rates of permanent immigration in the world,[2,38] and has a history of having one of the oldest programs for employer-funded worker compensation.[39] There is also a publicly funded healthcare system in which workers communicate injuries to physicians, who then guide them to the appropriate compensation and rehabilitation venues.[40] Accordingly, we expect that the presence of structural mechanisms, such as worker compensation and publicly funded health care systems, would make it easier for reporting, treating and collecting information about occupational health conditions, for which reason more data concerning MSDs in women is crucial.

This paper also focuses on women because there is generally limited knowledge on migrant women's experiences of workplace health, and also because we are theoretically guided by a feminist political economy lens. This guiding framework is used for this paper because we recognize that sex, gender, culture, race, income and working conditions are social determinants of health (DOH/SDOH). The theoretical approach of feminist political economy explores women's social, political and economic conditions, connects these to health, acknowledges that health disparities are experienced by women and that women's health intersects race and migrant status primarily due to their social, political and economic contexts.[41,42,43,44,45] Feminist political economy is a branch of materialism, which has a worldview that power is produced or reproduced through organizations, interest groups, social structures, various classes and material conditions.[46,47] Feminist political economists argue that material and cultural discrimination against girls and women are the primary factors that influence their social conditions and health.[30,33] The health problems women face emerge from the discrimination and disadvantage that they experience as they carry out the gendered activities making up their daily lives.[30,48] Women, for example, might be confined to households because their work is not perceived as exchangeable for wages in the market, and the women who participate in the labour market often do so as a reserve supply on either daily, weekly, seasonally, and/or part-time basis to respond to demand.[33] Furthermore, working women may also face dual demands of paid/

economic work and unpaid domestic responsibilities, which has a direct effect on the way women participate in certain sectors of the labour market and how women experience wage disparities.[33] We believe these dual demands of paid and unpaid responsibilities also differentially affect women's health compared to men because of the DOH/SDOH and political economy approaches.

Methods

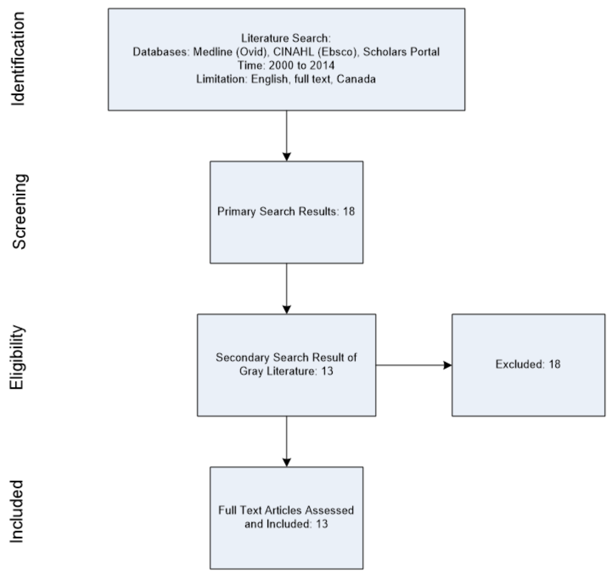
A scoping review of the literature was conducted based on Arksey and O'Malley's (2005) methodological framework.[6] Scoping literature reviews, unlike traditional systemic reviews, investigate broad research areas, issues and concepts. This process can be divided into five stages: 1) identification of a research question; 2) identification of relevant studies; 3) study selection; 4) charting data and 5) collating, summarizing and reporting results.[6]

Accordingly, the objectives of this paper were to 1) identify occupational health literature, which focused on work-related MSDs among vulnerable groups such as immigrant women, with a novel focus on immigrant women from South Asia, and 2) identify knowledge gaps in the field of occupational health.

The quality of the papers that were assessed was determined by examination of the following as inclusion criteria: 1) inclusion of "MSD," "MSI," "pain" or "strain" in the title, abstract, results or discussion; 2) clear presentation of a rationale, objective and/or research question that examined South Asian women's work experiences in Canada; 3) explicit mentioning of the type of work engaged in and 4) use of high quality and rigorous quantitative and/or qualitative methods of analysis. Papers were excluded if they did not examine SA women in the study, did not conduct research in Canada and did not examine MSDs.

In order to locate primary papers on the aforementioned topic, keyword search terms were entered in databases such as Ovid Medline, CINAHL (Ebsco) and Scholars Portal. We used these databases because they tend to capture manuscripts from a variety of disciplines, including allied nursing, rehabilitation and health sciences. We used key terms as follows: work/occupation/musculoskeletal/MSD/women/Canada/immig* (denoting immigrant or immigration)/South Asian/South Asia (which included India, Pakistan, Bangladesh, Sri Lanka, or Nepal). These searches were limited to the English language, years ranging from 2000 to 2014, and excluded dissertations, conferences and studies involving undocumented migrants. We excluded dissertations and conference papers because these types of papers are usually submitted for publication and would unlikely yield any more relevant articles or information. We excluded undocumented migrants because the scope of our study is limited to employed economic migrants (i.e. permanent immigrants that enter Canada through the skilled worker program and who are authorized to work). Undocumented migrants include temporary visitors, students or asylum seekers who have overstayed their visit beyond visa requirements as they are unlikely to work in the same standard employment conditions as permanent migrants who would otherwise require legal documentation or visas.

Figure 2: Flow diagram indicating search strategy



Search strategies included a primary strategy of electronic resources, followed by secondary search strategies including: manual searches from reference lists of primary papers, and gray literature—textbooks on women's health, institutional electronic publications and websites, such as Institute of Work and Health and Google Scholar. In the manual search section, studies were selected if they were Canadian studies that examined immigrant women or Canadian studies that included subsets of SA immigrant women. The included studies were carefully reviewed and relevant information was extracted and charted (Table 1). The analysis process entailed identification of themes and knowledge gaps such as: non-reporting of MSDs, socioeconomic class effects, high-risk occupations, psychosocial factors, women's roles, dual demands/double workdays and cultural factors. We provide a summary of identified themes along with what is already known from the existing body of literature.

Results and Findings

The scoping review process resulted in 13 peer-reviewed manuscripts that are tabulated and thematically organized in this paper. The gross number of results retrieved from the keyword search was N=18 (Figure 2). Search results retrieved zero returns for the database Medline Ovid, five results for CINAHL (Ebsco), and 13 results for Scholars Portal. After refining and filtering for repeats and relevance to search terms, no studies were found that were specific to work-related MSDs among South Asian women in Canada. This prompted a secondary search in which 13 sources were retrieved from manual search of reference lists and gray literature (Table 1). Datasets comprised of qualitative (n = 6) and quantitative (n = 7) studies, and data generally showed that women experienced MSDs differentially than men and in some cases, were vulnerable to work-related MSDs for a variety of reasons. Several themes and knowledge gaps were identified from the included studies and are also reported.

Non-reporting of MSDs

Non-reporting of MSDs, and in general occupational injuries or illness among immigrants, is an important knowledge gap that was identified from our search. Among the included studies, one study by Thurston and Verhoef (2003) examined Canadian data of immigrant groups[49] (Table 1). Thurston and Verhoef's (2003) study shows that the injury rate from work due to an illness or injury (termed lost-time rate) was higher among the survey sample than the provincial compensation board's lost-time rates. Provincial compensation boards are Canadian government agencies that conduct surveillance and gather data on occupational injuries and illnesses.[50] Thurston and Verhoef's (2003) study indicates that there is serious under-reporting of work-related injuries and illness among immigrant groups. It is also possible that a high injury rate among immigrants partially supports evidence alluding to the phenomenon of the healthy immigrant effect, indicating that immigrants report declining or worsening health due to their working conditions and occupational injuries.

Existing literature suggests knowledge gaps in surveillance of MSDs exist among migrants due to a variety of reasons. For example, one study acknowledged the problem of non-reporting of MSDs in the compensation system in California, and cited numerous reasons for this problem among their Asian immigrant participants, such as lack of knowledge of the compensation system, lack of assistance with using the system, language barriers and limited access to medical services.[51] Although there are no Canadian studies pertaining specifically to MSDs among immigrant women, evidence suggests that Canadian immigrant women also experience problems such as language barriers and limited access to medical services.[52] Premji et al. (2008) showed that occupational health and safety information was not well understood by the immigrant women in their sample due to poor proficiency in English and/or French languages, which could potentially conceal reporting of

Author, Year	Country/Region Population	Aim of Study	Methodology	Relevant Outcome/Results/Summary
Choudhry et al 2002	Toronto: Canada	To examine SA immigrant women's health promotion issues through participatory action	Qualitative	-The SA women in the sample were involved in care of grandchildren and housework; allowing for little time to focus on themselves; -SA women in nuclear families lacked traditional social support networks and lacked assistance with household tasks; -The women viewed themselves as self-sacrificing;
Cole et al 2002[1]	Cole et al 2002 Toronto: Canada	To identify factors (predicting variables) for changes in MSD symptoms and interference of work activities in newspaper employees	Quantitative	-Women had increased odds ratio for symptoms model changes; -Women were less likely to remain from phase 1 to phase 2 due to work interference;
Coutu et al 2005[2]	Quebec: Canada	To evaluate validity and responsiveness of quality of life inventory for workers on sick leave due to MSDs	Quantitative	-In the sample, women tended to have upper extremity MSD pain and men tended to have lower back pain;
Dyck and Dossa, 2007	BC: Canada	To study SA women's experiences in constructing and practicing healthy space	Qualitative	-SA women in the sample worked in low paid jobs; -None of the women translated past education/professional skills into labour market; -They communicated their priorities around their family
Grewal et al 2005	BC: Canada	To examine the influence of family on SA immigrant women's health and health seeking behaviour	Qualitative	-The sample of SA women were expected by their family to hold full-time employment and take responsibility for most domestic chores in addition to traditional roles (obedient wives, dutiful daughters in law; nurturing mothers, self-sacrificing caregivers)
Leroux et al 2006	Quebec City: Canada	To study the association between psychosocial factors at work and prevalence of MSDs	Quantitative	-Women reported more prevalence of neck-shoulder symptoms than men (21.9% vs. 9.7%); -Workers with lower education level, higher domestic load, and experienced 2 or more stressful events in the previous year had higher prevalence of neck and shoulder symptoms -Workers who had high job strain and low social support were associated with neck shoulder symptoms -Workers who worked more than 6 hours a day on a visual display unit had higher incidence of neck and shoulder symptoms
Martins and Reid, 2007	Toronto, Canada	To understand the adjustment experience of South Asian immigrant women regarding influence of their occupations.	Qualitative	All participants had roles of homemaker, housewife, and caregiver; -A majority of the participants felt their education and qualifications from back home were not translated in Canada and they felt they could only work at "McDonalds" or "Tim Hortons".
Messing et al., 2009	Canada: Quebec	To compare strategies to analyze data by gender for the relationship between MSD and risk factors	Quantitative	-Analysis should be stratified by gender to identify risk factors for MSDs; -Working women had significantly higher prevalence of pain of the neck, upper back, shoulder, upper extremity and other regions within previous 12 months;
Premji et al., (2008)	Canada: Quebec	To describe how language proficiency influences occupational health, and how workers use strategies to address communication barriers	Qualitative	-A variety of health problems were attributed to work, with musculoskeletal disorders being widespread and universal, and injuries and illness were under-declared; -Production demands forced workers to work more, avoid taking breaks, or going to restrooms, indirectly affecting worker health; -Language barriers made it difficult for workers to express themselves, & to understand health and safety information offered by employers;
Smith, Chen and Mustard (2009)[3]	Canada	To examine the proportion of immigrants who worked in more physically demanding jobs than before migration to Canada	Quantitative	-Immigrants from Southern Asia had higher odds of employment in occupation with higher physical demand 2 years after arrival in Canada than their previous job outside Canada; compared to other regions; -Family class, refugees, those with less than a Bachelor's degree education, and those who had non-proficiency in English had higher odds of working in more physically demanding job upon 2 years after arrival in Canada;
Smith and Mustard (2009)	Canada	To examine work-related injuries among immigrants to Canada compared to Canadian-born workers	Quantitative	-Immigrant men with length of stay in Canada from 0- 5 years had significantly higher odds of a work injury requiring medical attention compared to Canadian-born men; -Immigrant women with length of stay of 6-10 years had a slightly higher odds of work injury requiring medical attention compared to Canadian-born women;
Spitzer et al., (2003)	Canadian: South Asian & Chinese East Asian	To examine the intersections of gender, carework, and migration in Canada	Qualitative	-Women's caregiving roles are central to cultural identity and family survival -Women experienced significant strain juggling demands of work and family; especially in low wage employment;
Thurston and Verhoef (2003)	Canada: Alberta	To study the rates of occupational injury among an immigrant sample in Alberta	Quantitative	-Lost time injury rate for immigrant workers in the sample was 6.02 compared to provincial worker compensation board's rate of 3.55;

Table 1: Description and Results of Literature Search

musculoskeletal injuries and illness (Table 1).[83]

Connecting socioeconomic class effects and high-risk occupations to MSD morbidity

Two studies highlight class effects among migrants that can be connected to musculoskeletal health, such as downward occupational mobility and participation in low-income occupational positions. Firstly, a study by Martins and Reid (2007) is particularly relevant as it showed that SA participants in Toronto were frustrated by the lack of recognition of their educational qualifications acquired from their countries of origin to Canadian-equivalency (Table 1).[53] All participants in this study reported having a university level education, such as a Master of Philosophy degree and college teaching credentials, but were unable to find meaningful employment in Canada. This failure to secure work left participants feeling compelled to work in low-income occupations in factories or fast food franchises such as Tim Hortons or McDonalds.[53] Other researchers report a similar finding, confirming that their sample of women in British Columbia held low paid occupational positions.[54] Both of these studies would support feminist political economy theory in that they highlight women's adverse employment experiences.

While neither of these studies discussed how migrant women's downward occupational mobility and participation in low-income occupations may lead to differential MSD morbidity, it seems to be an area that requires further research as previous studies support this linkage. For example, one study showed that blue-collar workers had higher overstrain and musculoskeletal morbidity compared to white-collar workers.[55] A Finnish study also showed that women had a profound and consistent occupational class gradient with tendency to have higher odds of MSD in lower occupational class than higher occupational class.[56] Another study further correlated MSD-related sickness leave rates with socioeconomic class gradients.[57] A Canadian study also indicated that blue-collar workers in transportation, processing and construction had higher prevalence of MSDs than other occupational groups.[58] Although there is a lack of significant Canadian research to demonstrate these linkages among immigrants, it is an area for further investigation in which knowledge gaps remain.

Psychosocial factors

Psychosocial factors, defined as factors that psychologically impact workers' health through responses to their work and working conditions, include job demand, job control, social support, time pressure, degree of monotonous work, extent of social reciprocity (or effort-reward balance), autonomy, fairness, job security and social contact between co-workers and supervisors.[59,60,61] Researchers at Simon Fraser University in Canada have developed 13 factors contributing to workplace health: workload management, psychological support, organizational culture, clear leadership and expectations, civility and respect, psychological job fit, growth and development, recognition and reward, involvement and influence, engagement, balance, psychological protection and protection of physical safety.[61,62] Job demand and job control are two types of psychosocial factors that affect health through the modulation of stress and anxiety among workers. Job-demand factors refer to work load, time pressures, work surges, work pace or rest breaks; while job-control factors refer to level of influence on work, level of participation in decisions, job satisfaction/dissatisfaction and level of social support.[63,64,65] Of these factors, some may be particularly relevant to SA immigrant women, such as psychological job fit, job demand and job control.

Psychosocial factors, such as high job demand, high workloads and time pressures can enhance an individual's vulnerability to MSDs and many historical studies have reported on these conditions.[65,66,67,68,69,70,71] Double workdays refer to the dual demands of paid and unpaid domestic responsibilities and are characterized by high job demands, high workloads and time pressures.[72] Immigrant women are vulnerable to double-workday stress due to domestic (unpaid) and paid work responsibilities.[31] Double-workday stress is particularly important as the high demands of paid and unpaid labour pose a potential risk for onset of MSDs.[19]

We identify psychosocial factors such as a high demand, high workload, time pressure and double work-days as themes from the included studies which support theories of feminist political economy and the dual demands placed on women. One study by Grewal et al. (2005) demonstrates double-workday tensions. The SA women in their sample communicated expectations to hold full-time employment and take on responsibility for most domestic chores in addition to traditional roles (Table 1).[73] In addition, another study by Chouhdry et al. (2002) also reported significant demands on SA women, including care for children, grandchildren and housework, which allowed for little personal time to focus on their own health. In this study, one participant reported that women were "martyrs" willing to do anything to provide for their families, and focused on others' well-being rather than their own health,[74] which is a major theme in the study. This result could further elucidate SA women's high workload, double-workday tensions and associated risk to MSD.

From the included studies in Table 1, a particularly relevant study by Spitzer et al., (2003) showed that that SA and East Asian women's caregiving roles are central to cultural identity and family survival,[75] but these women experienced significant strain juggling demands of work and family, especially in low wage employment (Table 1). Familial structure is documented in studies that showed traditional family structure is maintained by so-called "subordinate" roles of SA women.[76,77] Although not discussed in the paper specifically, it is possible that these demands might allude to a psychosocial pathway for musculoskeletal morbidity. For example, patriarchal beliefs and practices might impose high demands on SA women that could lead to fatigue, stress, anxiety and depression, the latter factors of which have been linked to MSDs.[70,78]

Likewise, in a quantitative study in the United Kingdom,[79] researchers reported that SA women experienced more stress in the working day than the general population. From a list of stressful conditions and events, it was reported that 31% of SA women were most stressed/pressured concerning household tasks. Only 4% of women in the general population reported that they were most stressed/pressured concerning household tasks. This study predominately comprised of SA groups that were Punjabi-speaking in origin, included Muslim and non-Muslim groups, and was compared to the general population. The general population was randomly sampled from the Strathclyde Regional Council's enhanced electoral register. Although occupational injuries were not discussed in this study, it is possible that the anxiety that was reported among SA women may be explained by "burnout" conditions (i.e. fatigue and exhaustion) that are common precursors to MSD due to both domestic and paid work.

Psychosocial factors such as low social support at work are associated with MSDs.[80] While this review highlights gaps in data pertaining to social support and its connection to MSDs among SA immigrant women, it is an area that needs to be explored since immigrant women are particularly vulnerable as having limited opportunity or access to help from friends and relatives and lacking social capital.[72] Accordingly, investigation of social support at work and the subsequent reporting of MSDs might be one research area.

Prevalence of MSDs

Studies generally show that more women experience work-related musculoskeletal problems than men.[22] In one study derived from the 1998 Quebec Health and Social Survey, researchers reported that females aged 15 and over, and working at least 25 hours per week had a high prevalence of musculoskeletal pain in the neck (18.4%), upper back (17.1%) and shoulders (15.0%) that interfered with their usual activities compared to men (10.9%, 11.4% and 11.6%, respectively, $P \leq 0.001$).[81] Table 1 tabulates the reviewed studies that examined the prevalence of work-related injuries (including MSDs) among female immigrant workers, in part comprising of SAs. One study by Premji et al. (2008) conducted in a garment factory in Montreal is useful in describing various health problems experienced by immigrant women.[82] In this sample, widespread musculoskeletal pain was reported among participants.

Other studies had prevalence data that seem to be contradictory. For example, while some surveys found that in general, immigrant women reported lower odds of work-related injuries compared to other groups,[49] other researchers found that immigrant women had a higher risk of work injury. For example, immigrant women with a length of stay of six to ten years had a partially increased risk of a work injury requiring medical attention compared to Canadian born women.[83] While this latter study might suggest that this particular group of immigrant women are vulnerable to work injuries, it is possible that this is under-reported, possibly due to a few limitations. In the latter study, the statistics on work injuries may actually be underestimated as data was derived from the Canada Community Health Surveys, and did not capture injuries that were due to repetitive movements,[84] which would preclude MSDs such as carpal tunnel syndrome. Furthermore, wording such as "limiting normal activities" may have been interpreted differently among the respondents as it would depend on how one would subjectively define a "normal" activity and how that activity is limited by injury.[84] Thus, it seems that knowledge gaps remain warranting further research.

Conclusions

The objective of this paper was to gather information of immigrant women's occupational health, with a novel focus on the SA population in Canada. Although there is no existing literature exploring MSDs among South Asian immigrant women in Canada, we identified several factors influencing knowledge in this area and in this group including: non-reporting of MSDs, possibly due to cultural factors such as language barriers, unfamiliarity with the compensation system, socio-economic class effects that might increase the vulnerability of immigrants and/or participation in high-risk blue-collar occupations. Furthermore, psychosocial factors such as time pressures, double workdays, job demand, cultural factors and/or role expectations might also influence onset of MSDs.

Strengths and Limitations

This paper focuses on the occupational health of SA immigrant women and was based on a refined and novel research question: to examine what is known in the literature about musculoskeletal disorders among SA migrant women in Canada and to identify knowledge gaps in the literature. One of the strengths of this paper is that the search strategy may be useful in its applicability to other global studies involving immigrant groups in which there are similar behavioural, cultural and occupational experiences. While this study employed Arksey and O'Malley's search strategy, it further identifies knowledge gaps fundamental to the field of occupational health research.[6] Furthermore, one may utilize the results for health promotion strategies and interventions for immigrant groups if similar themes and issues are identified, such as language barriers, high workloads, high domestic demands and participation in manual occupations that have high MSD risks.

As with other types of reviews, this paper had some general limitations and epistemological challenges. Firstly, this paper did not assess the quality of the papers themselves, but rather attempted to collect information available on the selected topic that were available to the researchers. Secondly, although the term SA was narrowly defined and precluded migrant subgroups from other geographic regions, it may still pose confusing terminology as individuals may (or may not) self-identify as SA origin, such as those of West Indian, Caribbean, East-African, Tanzanian, Mauritian or other heritage. Although the general definition of SA includes large Indian, Pakistani and Bangladeshi diasporas, the definition is expanded in this paper to include Sri Lankan and Nepali diasporas. Expanding the definition of the SA diaspora is currently being debated for greater inclusivity, but is not expected to impact results significantly. Thirdly, this paper is limited in that a finite number of keyword synonyms were generated by the researchers and entered as the search terms. Nevertheless, the databases themselves also generate synonyms to match keywords, but these are rarely displayed. For example, Ovid Medline, has "controlled vocabulary, [is] professionally indexed, and synonyms are generated by the database, which uses sophisticated matches to subject headings using a tree structure".[84] Finally, another limitation arises from the process of hand-searching, which has drawbacks due to offsite storage away from the main libraries (ibid), which were not accessible to the researchers.

This paper highlights and extends work related to feminist political economy. It suggests that there is a need to examine and broaden knowledge of occupational injury among SA immigrant women and how cultural factors and gendered roles could explain disparities in health and self-reporting of injuries (or a lack of reporting thereof) in this population. Although this paper has a specific population focus, its implications are significant for global health because it highlights a novel and under-researched yet highly health-limiting problem of musculoskeletal disorders that are relevant to global migrants. As musculoskeletal injuries are a major health burden, there is an urgent need to investigate this area in future studies.

Given the above strengths and limitations, the implications of this study's findings are threefold and the authors offer a few recommendations of recourse such as filling data gaps and securing improved working conditions for immigrants, racialized persons and women in order to minimize the risk of MSDs. First, government financial support programs should be considered in order ensure adequate surveillance and data collection of musculoskeletal injuries that is stratified by gender, ethnicity and immigrant status. Secondly, the findings could warrant policy changes that would prioritize occupational health, allow for greater recognition of immigrant skills and experiences and introduce employment models that would in turn allow for increased flexibility to fit the needs of women workers. Finally, the issues presented should also be on the agenda of global public health research, as ignoring them will lead to the possibility of diminished occupational health of workers.

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Field Notes

Opioid Overdose in Taos, New Mexico

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In 1898, Bayer Pharmaceuticals introduced heroin to America. Today in the United States, modern prescription pain medications have surpassed heroin in overdose deaths, resulting in nearly 19,000 fatalities annually (compared to 10,574 overdose deaths per year attributed to heroin). In low-income, rural communities suffering from this epidemic, efforts are underway to reduce harm associated with opioids, including pain medication and heroin, and to increase access to naloxone, a life-saving opioid antagonist. A better anthropological perspective on this epidemic is needed to understand the social and cultural factors of drug overdose and its control. This study, conducted in Taos County, New Mexico, utilizes participant observation among local medical professionals to examine their unique experiences and perspectives on the topic of opioid overdose in this community. A total of 1616 demographically varied medical workers in Taos also served as informants through semi-structured interviews conducted for this qualitative analysis. Our findings indicate that prescription and illicit opioid abuse are intertwined and affect a wide range of people in Taos. Local attitudes toward treatment including concerns regarding treatment efficacy and social stigma are also important considerations. This study illustrates the multi-faceted complexity of overdose culture and reveals the need for additional attention to existing treatments, increased education and more accessible resources.

Introduction

> "Of all of the nations in the world, America consumes the most opium in one form or another…The habit has this Nation in a grip, to an astonishing extent. Our prisons and our hospitals are full of victims of it, and it has robbed ten thousands of business men [and women] of sense…The drug habit has spread throughout America until it threatens us with very serious disaster."[2]

What is most striking about these statements is not the dismal picture they paint, but that the New York Times published them over 100 years ago.

Despite 100 years of progress, including the establishment of major public health organizations and the allocation of government resources, the problem of drug overdose is worse nowthan ever before.[2] According to the Centers for Disease Control and Prevention (CDC), 120 people die every day from drug overdoses, totaling approximately 43,000 deaths per year.[3] The majority of these overdose deaths result from the abuse of prescription opioids such as morphine, oxycodone and codeine.[3]

The CDC has declared that opioid overdose, partnered with widespread addiction, is an epidemic in America. More than 21 million Americans are addicted to prescription opioids, and 467,000 others are addicted to heroin.[2] After West Virginia, New Mexico has the highest rate for drug poisoning deaths in the U.S. at 27.3 fatal overdoses per 100,000 people, which is nearly twice the national rate (14.7 per 100,000). Taos County and its neighbors in northern New Mexico have the highest rates within the state (up to 67.7 deaths per 100,000 people). The nature of overdose as an epidemic demands analysis from an interdisciplinary approach that evaluates the biological, psychological and social factors of addiction. This study considers each of these influences in a holistic, location-specific manner.

Taos, New Mexico, is home to a diverse community with extensive history. Taos County spans a total area of 2,203 square miles and is home to 32,907 residents—approximately 15 people per square mile. The median household income in the area is $35,823. The median age is 40. 86.6 percent of persons over 25 years old in Taos have graduated high school. 28.9 percent of this group has earned a bachelor's degree or higher level of education. The three most highly represented ethnic groups in Taos are Hispanic or Latino (56.1%), Caucasian (36.1%) and American Indian (7.4%). The Taos Pueblo is also located within Taos County and was the site of many early historical and cultural events in the area. Currently, about 150 Pueblo natives live on this land full-time, and the Pueblo itself is attached to a reservation of about 99 thousand acres.[6] In addition, the city of Taos is a popular tourist destination, known for its natural beauty at the foot of the Sangre de Cristo mountain range, the thriving art scene and a rich cultural heritage.

In this setting, opioid overdose is a complex problem, and thus multiple intervention points are required. Factors of opioid overdose in Taos include: (1) historical trauma (involving inter-generational substance abuse) suffered by indigenous and migrant groups heavily represented in the population of this area; (2) the pharmacology of opioids and its physiological influence; (3) geography, including location along trafficking routes for Mexican black tar heroin, rural locale and an associated lack of resources. and (4) inadequate policies, such as low prescribing standards and insufficient treatment methods. Given the breadth of factors and complexity of the problem, community-wide involvement from multiple intervention points is necessary to resolve the opioid overdose epidemic. This study addresses three inter-connected classifications of factors implicated in opioid overdose in Taos, New Mexico: the biological, the psychological and the social.

Historical Overview

The term "historical trauma," a concept used in psychological and social scientific literatures, refers to cumulative emotional and psychological wounding, extending over an individual lifespan or across generations and caused by traumatic experiences. For example, historical trauma has been studied through longstanding clinical observations of the deleterious psychological effects of the Holocaust, both among survivors and their descendants. Contemporary Native Americans are another such group that has been shown to suffer from disproportionately high levels of psychological distress as the descendants of North America's indigenous people. European colonial policies and practices of ethnocide subjugated native groups and ultimately led to the distress that characterizes historical trauma among native peoples.

The relationship between substance abuse and historical trauma has been substantiated by research, including the work of Joseph Gone, who has shown the importance of addressing historical trauma in his work with clients in a substance-abuse treatment program on a Northern Algonquian reservation in Canada.[9] Historical trauma thus offers an explanation for the intergenerational accumulation of risk for poor mental health, including addiction.

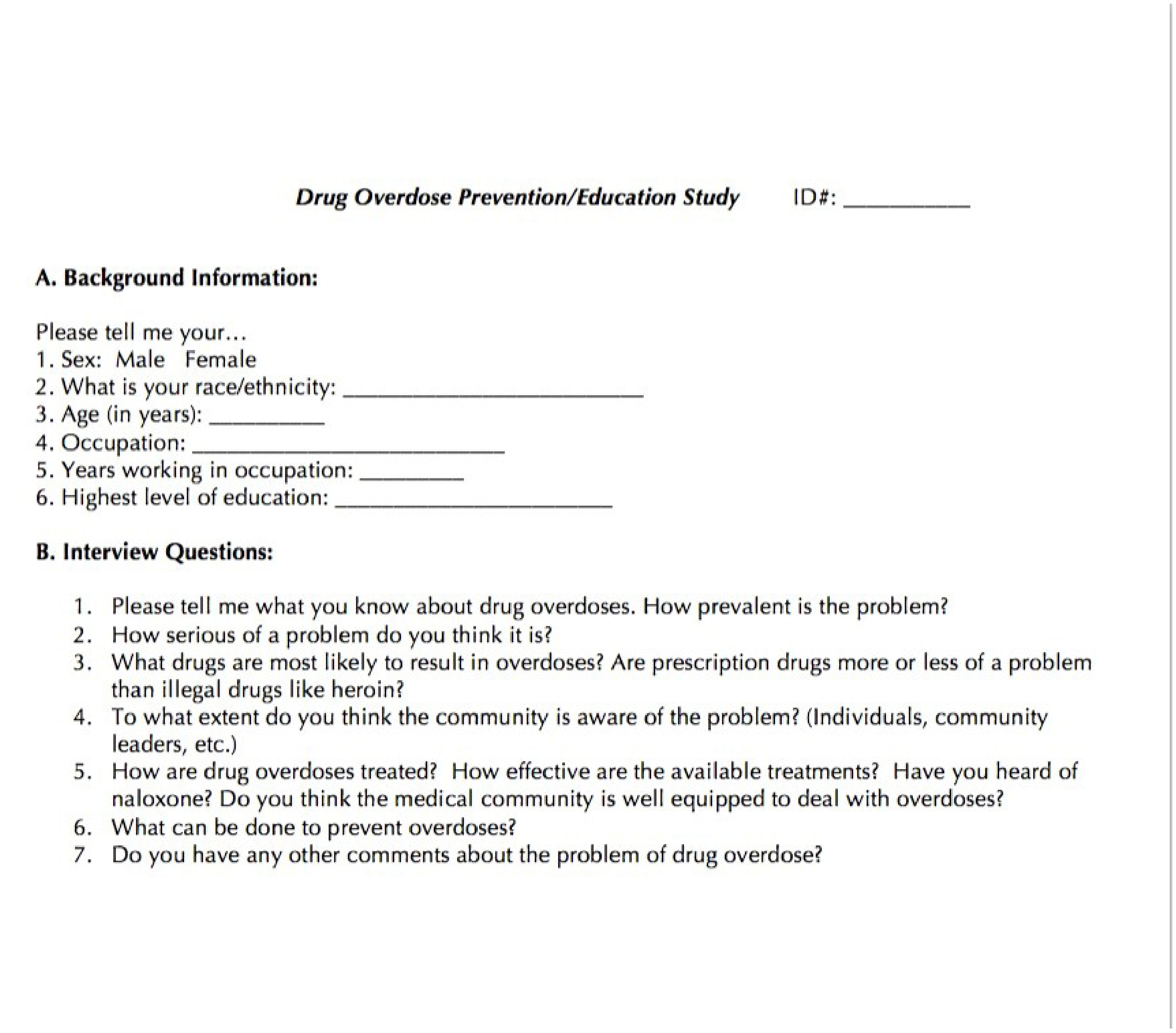
The cultural conflict in Taos that has led to intergenerational historical trauma began over 450 years ago when Spanish conquistadors arrived at the region. At the Taos Pueblo, the conquistadors found one of the oldest continuously inhabited communities in America. Spanish settlers established Catholicism and enforced a strict conformity to its doctrines in the upper Rio Grande Valley. Rising cultural and religious tensions eventually led to a resistance by the Acoma people.

In retaliation for the violent resistance to Spanish rule, over 500 Acoma people were killed, and hundreds of others were enslaved during the 1598 Acoma Massacre; this event instilled a deep fear and resentment of the Spanish in the region for many years. Additional unrest permeated the area in the 1670s as nomadic bands of Apache and Comanche tribes raided the Pueblos and Spanish settlements. These conflicts culminated in a large-scale rebellion among 46 Pueblo communities across northern New Mexico. In August of 1680, all Spanish settlements were destroyed and Santa Fe (70 miles south of Taos) was besieged during the Pueblo Revolt. After the revolt, each Pueblo community governed themselves, but the raids by other native groups continued. The Pueblo Revolt lives on in the cultural memory of the Pueblo people today as a symbol of their independence and cultural heritage.

Then, with Spanish reconquest in 1692, a balance of cultural diversity was achieved in the region, as is seen today. New Spanish rule was still imperfect in its effectiveness and periodically oppressive and severe, but the defiant Pueblo people retained a strong sense of rights, group identity and separation from surrounding groups.

Newcomers again arrived in Taos during the 19th century as wagon trains and eastern merchants followed the trailblazers of US westward expansion. Cultural diversity in the area (beginning at this time to also include Anglo-American influence) continued to expand, giving the region its distinctive multicultural personality and history. Occupation of New Mexico by the United States in 1847 during the Mexican-American War led to another violent uprising by both Taos Pueblo Indians and Hispano nationalists, who faced land grant losses; several convicted rebels were sentenced and hung in Taos Plaza. The 1848 Treaty of Hildalgo officially declared New Mexico, along with Texas, Arizona and California, as part of the United States.

Clashing cultures and conflict over the past 400 years have created in Taos a unique cultural atmosphere that is both tolerant and segregated. These often violent historical events have had a widespread psychological impact over time, not only among the Pueblo people but also among the other cultural groups that have suffered tremendously. With regard to ownership and belonging,



Drug Overdose Prevention/Education Study ID#: ___________

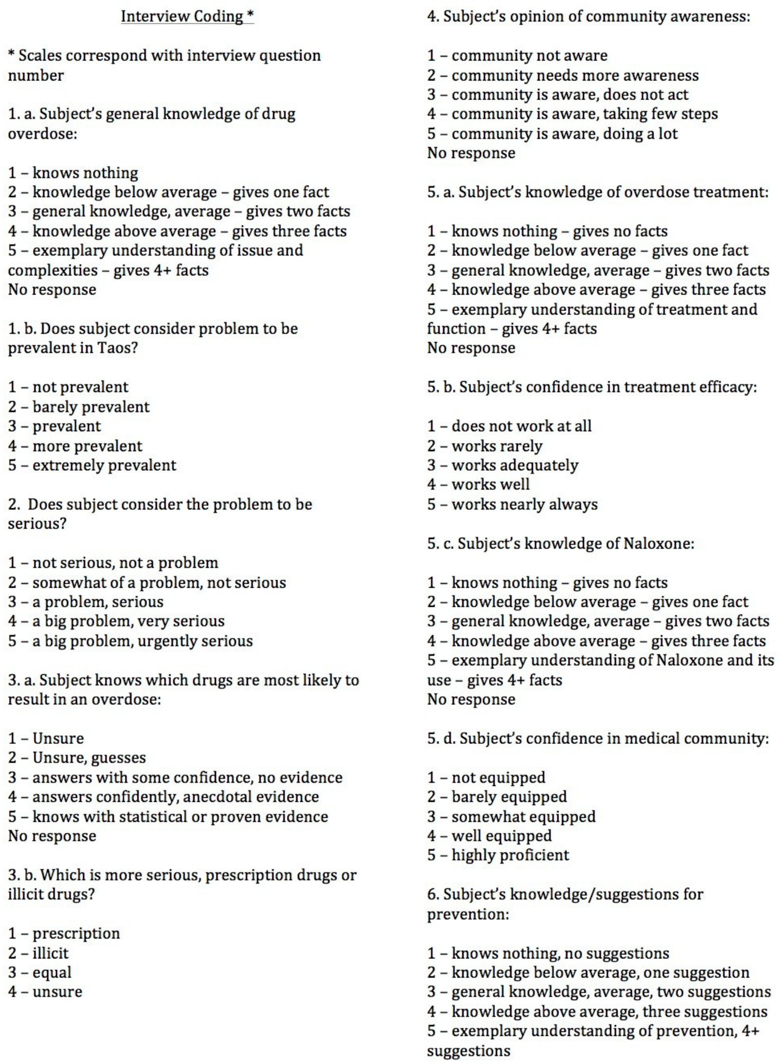
A. Background Information:

Please tell me your…
1. Sex: Male Female
2. What is your race/ethnicity: ________________________
3. Age (in years): _________
4. Occupation: _________________________
5. Years working in occupation: ________
6. Highest level of education: ______________________

B. Interview Questions:

1. Please tell me what you know about drug overdoses. How prevalent is the problem?
2. How serious of a problem do you think it is?
3. What drugs are most likely to result in overdoses? Are prescription drugs more or less of a problem than illegal drugs like heroin?
4. To what extent do you think the community is aware of the problem? (Individuals, community leaders, etc.)
5. How are drug overdoses treated? How effective are the available treatments? Have you heard of naloxone? Do you think the medical community is well equipped to deal with overdoses?
6. What can be done to prevent overdoses?
7. Do you have any other comments about the problem of drug overdose?

Figure 1: Semi-Structured Interview Questions



Interview Coding *

* Scales correspond with interview question number

1. a. Subject's general knowledge of drug overdose:

1 – knows nothing
2 – knowledge below average – gives one fact
3 – general knowledge, average – gives two facts
4 – knowledge above average – gives three facts
5 – exemplary understanding of issue and complexities – gives 4+ facts
No response

1. b. Does subject consider problem to be prevalent in Taos?

1 – not prevalent
2 – barely prevalent
3 – prevalent
4 – more prevalent
5 – extremely prevalent

2. Does subject consider the problem to be serious?

1 – not serious, not a problem
2 – somewhat of a problem, not serious
3 – a problem, serious
4 – a big problem, very serious
5 – a big problem, urgently serious

3. a. Subject knows which drugs are most likely to result in an overdose:

1 – Unsure
2 – Unsure, guesses
3 – answers with some confidence, no evidence
4 – answers confidently, anecdotal evidence
5 – knows with statistical or proven evidence
No response

3. b. Which is more serious, prescription drugs or illicit drugs?

1 – prescription
2 – illicit
3 – equal
4 – unsure

4. Subject's opinion of community awareness:

1 – community not aware
2 – community needs more awareness
3 – community is aware, does not act
4 – community is aware, taking few steps
5 – community is aware, doing a lot
No response

5. a. Subject's knowledge of overdose treatment:

1 – knows nothing – gives no facts
2 – knowledge below average – gives one fact
3 – general knowledge, average – gives two facts
4 – knowledge above average – gives three facts
5 – exemplary understanding of treatment and function – gives 4+ facts
No response

5. b. Subject's confidence in treatment efficacy:

1 – does not work at all
2 – works rarely
3 – works adequately
4 – works well
5 – works nearly always

5. c. Subject's knowledge of Naloxone:

1 – knows nothing – gives no facts
2 – knowledge below average – gives one fact
3 – general knowledge, average – gives two facts
4 – knowledge above average – gives three facts
5 – exemplary understanding of Naloxone and its use – gives 4+ facts
No response

5. d. Subject's confidence in medical community:

1 – not equipped
2 – barely equipped
3 – somewhat equipped
4 – well equipped
5 – highly proficient

6. Subject's knowledge/suggestions for prevention:

1 – knows nothing, no suggestions
2 – knowledge below average, one suggestion
3 – general knowledge, average, two suggestions
4 – knowledge above average, three suggestions
5 – exemplary understanding of prevention, 4+ suggestions

Figure 2: Codes for Interpreting Interview Responses

loss has characterized the region for many years and has left a lasting and collective impact on nearly all of its inhabitants: Pueblo natives, Hispanics, Anglo-Americans and more recent Latino immigrants. These painful sentiments include loss of people, land, family and culture. Such loss and suffering characterizes the historical trauma felt broadly in Taos. Through interviews and analysis of the healing discourse used in a community-based treatment center for substance abuse that address historical trauma, Joseph Gone has shown that acknowledging historical trauma bridges evidence-based treatment and employing culturally sensitive interventions can improve therapeutic outcomes.[9] Thus, historical trauma, as illustrated through the major cultural conflicts outlined, should be considered a major psychological and social factor to the problem of opioid overdose in Taos, New Mexico.

Biological Background

Biological factors of opioid overdose are also significant to understanding the epidemic. Opioids are synthetic or partly synthetic drugs that bind to opioid receptors throughout the body and reduce the transmission of pain messages to the brain, ultimately reducing the feeling of pain. Some commonly prescribed opioids include fentanyl, methadone, hydrocodone and oxycodone. Opiates, on the other hand, produce the same effect as opioids but are derived naturally from opium; examples include morphine, codeine and heroin. The terms 'opioid' and 'opiate' are used interchangeably. When an individual who is not experiencing physical pain, takes either opioids or opiates the person feels elated, then relaxed or drowsy. The reinforcing and rewarding effects of opioids, such as euphoria associated with opioid abuse, involve the mesolimbic dopamine system. This system is an evolutionarily old pathway in the brain that carries dopamine from one area in the brain to another and is responsible for controlling the brain's pleasure and reward centers.

Opioid tolerance and physical dependence occur when long-term use creates several cellular changes. Opioid receptors gradually become decreasingly responsive to opioid stimulation. Thus, tolerance increases as greater amounts of opioids are needed to release the same amount of dopamine. Physical withdrawal significantly contributes to opioid dependence and addiction and occurs after tolerance has already developed. The withdrawal phenomenon occurs after repeated exposure to escalating dosages of opioids, when the brain adapts to function normally in the presence of the drug and abnormally in its absence. In the absence of the opioid, enhanced hormone activity triggers jitters, anxiety, muscle cramps and diarrhea.[13]

Nearly every incident of opioid overdose is the result of respiratory arrest, perhaps the most serious adverse effect. This occurs when the opioid agonist produces respiratory depression to the point of apnea by acting on the respiratory centers of the brainstem. Opioids can depress any or all of the phases of respiratory activity, including rate, minute volume and tidal exchange.[13] Furthermore, the accumulation of CO_2 stimulates central chemoreceptors to increase respiratory rate as a means of compensation. However, this only masks the patient's degree of respiratory depression, and untreated respiratory depression can be fatal.

Naloxone, buprenorphine and Suboxone (a combination of the former two), all opioids, are forms of medication-assisted treatments to opioid overdose and addiction. Naloxone, also known by its brand name, Narcan, is an opioid antagonist. It reverses the effects of morphine-like agonists by blocking access to opioid receptors and can therefore revive patients who have suffered an overdose.[12] Withdrawal symptoms often present immediately when an overdose is reversed using naloxone. Buprenorphine is a partial opioid agonist and is used in treatment to wean patients off more dangerous opioid agonists by minimizing adverse withdrawal symptoms. The therapeutic response of buprenorphine depends heavily on the dosage. At low doses, potential for tolerance and dependence is minimal and can alleviate cravings and compulsive drug use while normalizing the hormonal disruption caused by prior opioid abuse. However, if buprenorphine is used at higher dosages or abused to elicit a high, then withdrawal symptoms will occur. Only by using relatively large doses of naloxone can the respiratory depressant effects of buprenorphine be reversed.[13] Suboxone combines the opioid antagonist, naloxone, with the partial opioid agonist, buprenorphine, to draw on the strengths of each while minimizing their adverse effects and potential for abuse. When taken as directed (sublingually), buprenorphine will be well absorbed and naloxone will not. If taken intravenously, the reverse effect will occur and withdrawal symptoms will transpire. This both prevents overdose and limits abuse (high-seeking or drug-selling behaviors) liability in the opioid-using community.[14]

Methods

This study follows a holistic approach to the problem of opioid addiction in Taos County and draws on the biopsychosocial approach to human illness. (1) Biologically, the pharmacology of existing treatments is reviewed; (2) the psychological realms of physical, spiritual and emotional pain are evaluated through ethnographic interview and participant observation. And finally, (3) social determinants including historical trauma, various interpersonal relationships and cultural contact are explored through sample design and semi-structured interview (Figure 1).

For nearly 150 hours over the course of eight weeks between June and August 2015, I worked directly with Taos County Emergency Medical Services (EMS), building personal relationships with emergency medical technicians (EMTs) and paramedics. An additional 150 hours during this eight-week period were spent observing and assisting staff at Taos County's single hospital, Holy Cross Hospital. The emergency room has 12 beds and sees an average of 42 patients per day. After six weeks of intensive observation and limited hands-on involvement, I performed the duties of an on-call educator, providing general overdose information, including how to use prescribed naloxone, for at-risk patients prior to ER discharge. This level of access and trust promoted in-depth information gathering and expanded my knowledge of Taos County's opioid addiction response network. In short, my familiarity with and participation in the daily operations of staff supported an anthropological and holistic approach to the subject of opioid use.

I interviewed 16 medical providers whom I had come to know during this eight-week period in Taos. Subjects ranged in age from 23 to 61 years and were members of each major cultural group in the county: Caucasian, Native American and Hispanics of both Spanish and Mexican descent. Interviews were solicited from the individuals with whom I built working relationships over the course of eight weeks in Taos, and participation was voluntary. Interviews lasted between ten and 45 minutes and were conducted at the main station for Taos County Emergency Services and at Holy Cross Hospital. The duration of each interview depended on the amount of elaboration per question and the inclusion of any additional information provided by the participant. Professions represented by these interviews include emergency medical technician, paramedic, pharmacist, community health worker, clinical social worker, prevention specialist and clinic administrator. Subjects were asked about their general knowledge of the issue, its prevalence in Taos, their perception of community awareness and various dangers and treatments associated with both illicit and prescribed opioids. A complete informed consent discussion (approved by the SMU IRB) preceded each interview. No one declined or withdrew.

Finally, interviews were coded using interpretive analysis and through the assignment of scaled response to a limited number of questions (Appendix, Figure 2). Codes were considered thematic if they occurred across a minimum of six interviews.

Results

The key findings of this research specifically draw on recurring themes throughout the interviews conducted. The most significant findings of this research include (1) the pervasiveness of opioid overdose in Taos, (2) the relationship between prescription and illicit drug abuse and (3) the prevailing negative attitudes regarding available treatments.

Pervasiveness of Opioid Overdose

Every subject who was interviewed considered the problem of overdose in Taos to be either very prevalent or extremely prevalent. The problem was also widely considered by interview subjects to be serious. 58% considered the problem to be very serious, and 33% consider it to be urgently serious. A prevention specialist supported her claim saying, "last year we had an opioid reversal of a 13 year-old—this is serious." Another participant considered the problem to be serious but inevitable—perhaps a reaction to widely experienced feelings of helplessness, as discussed later in this paper.

As previous research conducted on substance abuse in the upper Rio Grande suggests, Taos County EMS was called to respond to many incidents of gang members on heroin, but the opioid problem proved to be far more pervasive. During my time working closely with the Taos County EMS ambulance service, we treated elderly patients, a young mother addicted to pain medication, as well as a man who attempted suicide and a woman who had accidentally mixed up her pills. We responded to drug-related calls at the prison, the Pueblo and at wealthy ranch estates. There does not appear to be substantial demographic differentiation corresponding generally to the impact of opioid abuse and overdose in Taos.

My own first-hand experiences with the diversity of individuals afflicted by opioid addiction were reiterated during the interviews. "In the prison, the demographic that I see most affected by heroin is low-income, no jobs… gang members. They come into jail again and again, and immediately they know to ask for the withdrawal packet," explained an EMT who also worked in the local jail. However, he continued by describing another demographic completely, represented by a formerly well-respected nurse in the community, whose life was destroyed by opioid addiction:

> "There's a nurse in jail right now who was an RN [registered nurse] at the hospital; he was suffering from back pain. He used to work at the Taos Living Center [(TLC), a local nursing home], and he was starting to steal the patients' medications. He got caught and went to rehab. TLC fired him, Holy Cross hired him in the ER and he started stealing morphine… then he started doing heroin. They found him in the employee bathroom of the ER with a needle in his arm, full of heroin. There are people that get into it that way - they can't get their prescriptions filled. Now he's looking at 29 years (for drug and other associated charges). He was an awesome ER nurse, but he just got hooked."

Across measures of age, gender and ethnicity, Taos consistently has higher rates of opioid prescription, usage and overdose compared to that of New Mexico and the United States.[4] On the theme of pervasiveness across the community, another EMT proposed, "It's rich people, honors students and athletes. Everyone is using. It's a network that just keeps growing."

While opioid overdose spans many demographic groups in Taos, statistics show that the overdose rate is especially high for middle-aged Hispanic men in Taos County (about 72 per 100,000).[4] Ethnographer Angela Garcia demonstrated in her book, The Pastoral Clinic: Addiction and Dispossession along the Rio Grande, that among Hispanic families living in Northern New Mexico, older family members often become the primary sources of care for addicts, so the problem never comes to the attention of health workers. This phenomenon is commonly known as m'ijito-itis—as in, "I'll do anything for m'ijo [my child]".[15] A Hispanic paramedic expresses similar concerns specific to her ethnic group:

> "There is a large Hispanic community here and people here baby their kids. Thirty year-old men should not be living with their moms… If parents don't want to accept that their kid does drugs, they say 'oh, not m'ijito, something's wrong with him'. It becomes everyone else's problem. Here's an example: I have this friend… her son was fourteen when he started hanging out with a kid who introduced him to huffing cleaner [inhaling chemical vapors to elicit a high]. He did it for years. People rumored about it, but it wasn't until her son died—they found him in a bathroom with hundreds of cans of duster. So I go see

> my friend. All she was concerned about is what people would say if they found out. She was embarrassed. She said she offered to get him help, but he told her that he'd be mad at her. I mean, I'd rather my son be pissed off and alive."

Garcia's attention to the role of m'ijito-itis is reiterated by this paramedic's narrative of her friend's reluctance to admit the severity of her son's eventually fatal addiction. Although the chemical vapor involved in the provided narrative is a non-opioid, Garcia has shown that m'ijito-itis also applies to opioid addiction. For example, Garcia reports of a mother who frequently bought heroin for her child because she hated to witness the extreme pain of her child experiencing withdrawal symptoms.[15]

In short, opioid addiction in its numerous forms touches most segments of the diverse Taos County community. However, there is some variation across demographic groups depending on accessibility, price point and reputation associated with different drug types.

Illicit vs. Prescription Drugs

Generally, there is little concrete knowledge among interview subjects distinguishing the dangers of prescription and illicit drugs, but opinions regarding the two types of opioid differed widely. With regard to prescription versus illicit opioids, 50% of interview respondents believed prescription medications to be more dangerous; 33% believed the opposite, that illicit drugs are more dangerous, and one person believed the two types pose an equal threat. The responses provided here align quite well with overdose death rate data. In Taos, 48% of overdoses were attributed to prescription opioids. 34% were attributed to heroin. Although the "active ingredient" of heroin and prescription opioids is the same, the danger of heroin use is compounded by a lack of control over drug purity and the possibility of contamination. Similarly, prescription drugs are most dangerous when taken recreationally using variable methods to increase the euphoric effect, such as mixing or crushing pills prior to snorting or injecting the powder.

The relationship between prescription and illicit drugs and their respective reputations is complicated in several aspects: (1) there is a social stigma surrounding illicit drug use and (2) the danger of prescription drugs is often understated because they are perceived to be legally prescribed (although they are often prescribed to someone other than the user). "Prescription drug abuse is different [from illicit drug abuse] because the medication is dispensed by the medical profession; it's an iatrogenic problem, caused by the medical community because of overprescribing and the availability of the drugs," explained a pharmacist and Holy Cross Hospital director of health outreach. He continued, "A patient once asked me, 'why would anyone buy heroin when you can just go to your doctor?'" This statement reflects local considerations regarding use of each drug type, decisions which are made by weighing the risks and rewards of prescription and illicit opioids. In this case, the statement also confirmed the perceived ease of access to prescribed opioids.

Several respondents mentioned the transition from prescription to illicit drugs. "There's a group of people, mostly between the ages of 27 to 45, who started using pills [prescription opioids] years ago. But once pills got too expensive, they started using heroin," explained a paramedic. If one type of opioid becomes too difficult or expensive to obtain, the same individual may use the other type interchangeably, even varying daily. "People steal the prescription drugs from their mom, their grandparents. It's not difficult or expensive to swipe a bottle from a family member," stated a young EMT. "During my time of employment with the drug court, I mostly saw cases involving opioids." The pervasiveness of opioids compared to other drug types seen in court is thus linked to ease of access and the multiple avenues of obtaining the high, through either prescribed pain medication or heroin.

In terms of prevention efficacy statistics, the interchangeability of prescription and illegal opioids has proven true. A prevention specialist explained, "If you start working on prescription drug abuse and start putting a cap on amount of prescriptions, then we'll see an increase in illicit drugs; in prevention, it's become a balancing act." Therefore, effective solutions must target the underlying causes of opioid addiction while limiting access to both illicit and prescription drugs simultaneously.

Attitudes on Treatment and Prevention

Confidence toward current treatment efficacy ranges widely. Multiple subjects represented each of five categories, ranging from "does not work at all" to "nearly always works," practically evenly across the board. Regarding naloxone, specifically, most subjects interviewed (50%) had a general knowledge of the treatment, offering two facts or comments about naloxone, while 20% gave less information, and 30% gave slightly more. 83% of subjects believed the medical community to be at least somewhat well equipped to deal with overdose. One subject expressed a complete lack of confidence in the ability of the medical community to handle overdose situations—"The emergency room is a revolving door, because there are so many people to take care of. You overdose, you're revived; you're in, you're out. And pretty soon, you're back with another overdose…the treatments aren't effective because people won't change unless they want to change," stated the paramedic matter-of-factly. These varied findings reveal the wide range of knowledge and opinion within the Taos medical community regarding the treatment of opioid overdose.

The local drug court system (as previously mentioned) is one avenue for treatment related to illegal drug use. The drug courts operate to keep non-violent offenders drug-free and drug-free through intense judicial oversight, treatment, supervision, mandatory periodic drug testing and the use of appropriate sanctions, incentives and other community-based rehabilitation

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"As for a society, the utility of pain must also be reconciled; pain serves the purpose of communicating when something is going on within us."

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services. “Most [opioid users] don’t have jobs, so they steal to support their habit… there are also a number of gangs that center on the buying and selling of these drugs in Taos,” an EMT explained while discussing the drug court program. Many times, individuals in the drug court program begin medication-assisted treatment using take-home, prescribed buprenorphine (partial opioid agonist), often combined with naloxone (opioid antagonist) and known as Suboxone, to minimize withdrawal symptoms.

The professionals interviewed in this study generally regarded the efficacy of the Suboxone treatment method pessimistically. The controversial ingredient in Suboxone is buprenorphine; as previously discussed, buprenorphine, like other many other opioids, is addictive and has a high potential for overdose depending on dosage. “The Suboxone-prescribing doctors have a cap of how many patients that they can see. Usually that cap is met by the court orders and those who are really persistent. There are not enough resources to go around… Suboxone is supposed to be used for the withdrawal period—and for that, it works. But people come out of jail, having already kicked the habit and try to get on a Suboxone program just to abuse it,” explained an EMT and former employee of the drug court. The pharmacist that I interviewed had an alternate view of the treatment:

> “Originally, I had an aversion [to Suboxone], thinking, ‘so, you have a problem with opioid dependence, let me give you an opioid!’ It made no sense. And knowing that the drug was diverted and abused to a great degree really bothered me. But lately, I’ve come to realize that the goal should (1) be abstinence and recovery, emphasis on recovery that allows them to live happy and useful lives without opioid addiction. For some people, that is not a possibility. (2) There’s a group of people that Suboxone can help, but there needs to be an exit strategy with a very structured plan. Then, (3) there’s a third population of people that suffer from the disease of addiction, and they will never want or be able to lead normal lives. They may need to be on Suboxone indefinitely, reducing the harm associated with abhorrent behaviors. Even still, there must be surveillance, monitoring, pill counts and urine tests.”

Nevertheless, alternative options to buprenorphine are very limited for addicts seeking therapy in Taos County. During her interview, a clinical social worker at Holy Cross Hospital explained that treatment options are often too expensive or limited in capacity for those who urgently need them. For example, one local treatment facility charges $24,000 for the first 30 days, and others have waiting lists up to six months long. “The population in our community can’t afford to go to the treatment facilities in our community,” stated a local specialist in prevention. There are a few options that are more affordable in larger cities such as Santa Fe and Albuquerque, but for many, these are still inaccessible.

In light of this situation, many medical professionals interviewed for this study echoed a need for naloxone to be more readily available for administration by police and the friends and family members of at-risk individuals. The New Mexico Department of Health public health office in Taos will prescribe naloxone, free of charge, to walk-ins who are concerned about themselves, a family member or a friend who may be at risk for an opiate overdose as a means of harm reduction. Alternately, “People often pull up to the ER with their friend who has overdosed, throw them out and drive away; unless the ambulance or someone sees them, they die right there. People are afraid of the legal ramifications if they bring in their friend who has overdosed, but they are also high themselves,” explained another EMT who has also worked in the prison. Good Samaritan laws do not protect individuals who are high and seeking assistance for someone else if the former individual has any outstanding warrants for arrest.

I visited this public health office myself without disclosing my intention to observe the process of a walk-in obtaining naloxone. I was asked for my social security number, income, drug and sexual histories, address, government-issued identification card and emergency contact information. I was trained to administer naloxone and informed on other harm reduction programs such as clean needle exchange and local drop boxes for disposing of prescription opioids. I was prescribed up to four doses of naloxone and was encouraged to return for refills as needed. Though the prescription was in my name, I was told I could give it to anyone who needed it. This would all be carefully documented. New Mexico and several other states permit third-party prescribing as a means of prevention. Finally, I signed a confidentiality form and was on my way, naloxone in hand. Overall, the process went smoothly and seemed to be an effective way of distributing the opioid antagonist to those who wanted it, especially with proper publicity for the service. This program, however, is potentially problematic for individuals who are unable to provide a social security number or government ID.

Interview subjects had few strong suggestions for prevention of opioid overdose in the community; 42% offered only one solution, 33% offered two or three basic suggestions and 25% had an above average knowledge of prevention strategies, offering three or more well-considered suggestions. “This problem is a boat with a bunch of holes in it. We have to just start plugging the holes,” urged a prevention specialist, “Naloxone plugs one. Early education plugs another. We need to create more community support and work with medical providers and prescribers.” Every interview subject who answered this question explicitly stated a need for more educational programming in the community. EMTs and paramedics especially reiterated the need for education in the community, beginning at a young age. They told stories of fifth graders drunk at school and middle schoolers smoking heroin from their e-cigarettes during class. A paramedic reiterates the social factors of the issue and a need for early education: “A lot of it comes down to learned behaviors… eight year-olds don’t need to be up at two A.M. on a Tuesday because someone overdosed in the other room. It impacts them. They’re tired. They don’t eat. They can’t do well in school. Then the cycle restarts. We need to catch our kids young, even in elementary school. Once kids are old enough, they won’t care what you say to them.” Some educational programming exists in Taos, but interview subjects assess that the programming alone is insufficient.

Thus, socioeconomic variables are relevant to the three major themes of this research. Although opioid addiction touches all demographics in Taos County, the form and source of the opioids used and the treatments sought vary according to availability and ease of access.

Discussion

By exploring biological, psychological and sociological explanatory factors, we can begin to understand the pervasiveness of opioid overdose, the relationship between prescription and illicit drug abuse and local attitudes toward treatment.

Biologically, opioid use causes the release of dopamine, producing a pleasure sensation that the brain records as a memory, associating the positive feelings with the circumstances and environment in which they occurred; these memories—conditioned associations—may elicit strong cravings for the substance when the dependent or addicted user reencounters the same people, places or things.[13] With regard to small, tight-knit communities like Taos, conditioned association of opioids, with a variety of other social cues and supports, may be exacerbating the problem among all groups as the network of associations continues to grow. The phenomenon of conditioned association may help physiologically explain why individuals who are addicted to opioids often relapse and feel that they cannot escape the circumstances (people, memories, etc.) that contributed to their addiction in the first place.

Numerous clinical studies have also shown that those who use drugs are more vulnerable to both physical and psychological stress than the general population. One pharmacological explanation for this phenomenon is based on the fact that opioids increase cortisol production. Cortisol is a critical hormone in the body’s response to stress, as it increases the activity level of the mesolimbic reward system. This mechanism is one neurobiological factor contributing to the person’s desire to begin using drugs, as well as his or her compulsion to keep taking them.[13] From an applied psychological standpoint, “This is a cycle that affects you both mentally and physically. You’ll have withdrawals. [Opioid addiction] will damage your self-worth, sense of purpose. When you self-deprecate like that, the only thing that will fix it is getting high again," a paramedic explained.

This pharmacological explanation also has a social component rooted in local prescription practices. The iatrogenic nature of the prescription opioid problem relates to these prescribing standards. A pharmacist explained in our interview:

> "There is very little data that doses over 200 milligrams morphine equivalency per day, or using them for longer than a year, are effective—in fact, if you're on an opioid medication for an acute pain event after 90 days, there's a 50% chance in our medical system that you'll be on that same medication after five years – and there's also data to prove that this can be harmful, causing rebound hyperalgesia [an abnormally heightened sensitivity to pain]. We may be creating, and ultimately treating, the pain that we're trying to prevent."

In terms of prescription and treatment, many providers expressed confidence in naloxone but the efficacy of medication-assisted therapies including buprenorphine and Suboxone remains controversial. Following detox treatment, some addicts seek highs through their new prescribed medication. Some argue that the popular detox drug, buprenorphine, was not invented to end the problem of opioid addiction, but rather to perpetuate it for profit.[2] When using the drug recreationally, some users claim that their high is better on Suboxone than on heroin or prescription opioids. An EMT told me about a conversation that he'd had with a patient whom he has revived using naloxone five times in the past five years: "He told me that he's been off heroin for awhile now. He's not quitting, he's switching; he says the high is even better on Suboxone, for which he is legally prescribed!" Thus, the pattern of transition from addiction to prescription medications to heroin abuse (discussed previously) may again be reversed if patients with a heroin addiction become addicted to their treatment; the medical community must take caution.

> "When pain becomes too great for someone to overcome individually – when they begin to drown – the community is indispensable."

From a broader social standpoint, the concept of historical trauma rooted in the complex cultural history in Taos (see Historical Overview) is multilayered and is not solely centered on the individual. This differs from a "typical Eurocentric perspective of illness and treatment, which tends to reduce suffering to discrete illness with individual causes and solutions."[7] A Native American paramedic of 11 years explained, "There is a lot of history here [in Taos]. There are these big family networks that are steeped in tradition. These cultural networks create a tough dynamic with the large infrastructure of families and their politics. People don't openly talk about these problems, only behind each other's backs." In another interview, a local prevention specialist added, "There are families in our community in which parents and grandparents will do drugs with their children and grandchildren, and uncles share heroin with their nephews." Historical loss symptoms include societal-environmental concerns, such as domestic violence, poverty, lack of education and unemployment; psychological concerns such as substance abuse and mental health disorders including alcoholism, PTSD, depression and suicide and additional physiological concerns.[11]

Several of the risk factors for substance abuse are supported by historical trauma theory. In Taos County, opioid abuse may be related to low self-esteem, loss of cultural identity, history of abuse and neglect and self-medication due to feelings of helplessness. In explaining the risk factors of addiction in Taos, a clinical social worker asked:

> "Can you get a job? Were you encouraged in your education growing up? To be from here has its own burden and impact. How much ownership do you feel in Taos? Does belonging to one of these groups [Anglo-American, Spanish, Mexican, Native American] in Taos affect how you see the world and how the world sees you? Were you given opportunities, your fair share?"

The aforementioned societal-environmental concerns are also particularly relevant, as they are found to be statistically more problematic in Taos when compared to the national average; 25.3% of the population are below poverty level in Taos versus 15.4% nationally.[5] Treatment for conditions that can often result from historical trauma, including substance abuse and overdose prevention, should incorporate validation of grief and loss associated with historical trauma.[17]

In terms of historical loss, land in northern New Mexico is significant. In fact, only a generation ago, residents still lived primarily off the land, working the forests, ranching and farming. "There is some resentment (among many multi-generation residents) to the new-coming Anglos with money," explained a clinical social worker. "Because they have this money, and now everyone else has to pay more. If you're really going to get angry about it, you ask, 'who sold out?' Maybe this land has been in your family all this time, but you get a tempting offer and now you've sold out." Other subjects reiterated the sentiments that many Taos residents are unable to afford living in the same community that they have belonged to for generations, as prices and fences have gone up everywhere.

Garcia writes, "Memories and sentiments regarding land loss remain powerful tropes… locals draw a connection between land loss, poverty and addiction… but which was 'lost' is still there to see: it's all around them in the mountains, rivers, mesas and buttes." Garcia further questions how the land that is present, yet out of reach, in a context in which land is central to cultural identity and economic survival, may contribute to intergenerational experiences of loss and the attempt to cope through means such as heroin abuse. The poverty, isolation and the cultural and temporal "rootedness" of northern New Mexico create an imagined regional geography that has become the basis for growing tourism to the area. The cultural politics of this view perpetuate the dispossession and displacement of the local people.[15] "There's a drug culture in Taos. You hear about beauty, tourism. But there's a very dark underbelly to what's happening here. And that's not new," explained a paramedic whose family has lived in Taos for many generations.

The National Drug Intelligence Center (2008) reports that the geography of Taos also contributes to high rates of overdose associated with the potency of Mexican black tar heroin, which is transported throughout much of the United States via northern New Mexico. Black tar heroin is less refined than many other types of heroin, making it easier to produce and cheaper to buy. The purity level of black tar heroin is highly variable. "You take X amount [of black tar heroin] one time, and it's 10% pure, and the next time you take X amount it's 90% pure," explained a clinical social worker, "and you can guess what happens." The geographical location of Taos along trafficking routes for black tar heroin is thus another factor contributing to the prevalence of opioid overdose in the region.

The rural geography of Taos is also significant. In rural areas across the United States, heroin death counts increased by over 900% between 2011 and 2014. The rural-urban differences in opioid abuse, specifically, can be explained by three factors: (1) considerably greater prescription in rural areas, which allows for the rise of illegal drug markets; (2) stronger rural, social and kinship network relationships, which may result in drug diversion and distribution; (3) economic stressors that may result in greater vulnerability to general drug use, abuse and possibly eventual overdose.[19]

Associated with the rural geography of Taos County and in part due to the situation of poverty that many opiate addicts face here is a significant lack of resources and treatment options. The overdose problem is exacerbated by the fact that rural residents are less likely to have access to life-saving overdose treatments such as naloxone. The International Journal of Drug Policy recently published a study concluding that the national opioid overdose death rate is 45% higher in rural areas than in urban ones, but naloxone use by rural EMS staff is only 22.5% higher. Still, some are weary of making naloxone widely available. "You can't use Narcan to save yourself. Some of these people will die with the rescue kit in their pocket," explained an EMT. "Or [opioid users] will be less cautious, knowing that they have the antidote (naloxone)," another EMT added. This thinking is likely based on moral concerns rather than factual information, as studies do not support these claims. Increase in access to naloxone has shown no increase in risky behaviors associated with opioid use.

In summary, opioid overdose pervasiveness in Taos, the relationship between prescription and illegal opioids and local attitudes toward treatment can be understood in terms of the pharmacology of opioids presented, pointing to the role of physical addiction in overdose incidence. Historical trauma (including inter-generational substance abuse), geography, lack of resources and prescribing standards offer another critical perspective in understanding this epidemic.

Implications and Recommendations

Policy and interventions for Taos County must take into account the cultural and social networks that create and sustain inter-generational patterns of opioid addiction. A second implication surrounds the relationship among stress, opioids and cortisol production. Due to chronic social stressors experienced by Taos County residents, including the various common losses previously discussed, pharmaceutical treatment for opioid abuse should be partnered with interventions addressing environmental and social circumstances.[13] Third, a major policy concern is the lack of treatment plans including non-addictive alternatives to buprenorphine and insufficient distribution of naloxone throughout the community. This calls for collaboration with the prescribing community.

Finally, community-wide recognition of the problem is imperative to harm reduction and in the eventual resolution of this epidemic. This analysis aims to inform, and further research will contribute to that end. The small sample size is one limitation of this study, and future work could elicit more perspectives beyond those of medical professionals in Taos. Specialists from many different fields have varied recommendations, and I suggest that each intervention point be employed where possible. The Holy Cross Hospital director of health outreach describes the opioid problem:

> "Let me tell you a story… so there's a river with babies floating down it. Someone sees these babies and they jump in to rescue them. And they get one or two, but miss three or four. So they go back in the river and these babies are floating down the stream and they spend all day and all night rescuing these kids from certain destruction. And finally they get the idea to go upstream and see where the babies are coming from. And that's what I think about drug addiction. I think that when it hits the emergency room and we can treat an overdose and 'save another life, save another life,' and 'oh, we missed one here and then we save three more and miss another one,' but we really need to go upstream and find out where this is coming from."

By public health standards, greater attention needs to be given to the issue of opioid overdose in America, especially in deeply affected areas such as Taos County, New Mexico. Taos offers interesting and specific insights on opioid addiction in the United States. Many of the factors explored in this paper are applicable elsewhere, especially in rural and historically or culturally conflicted areas. Recommendations offered, including limiting access to opioids and increasing access to treatment resources, are applicable everywhere.

Geographical and environmental factors contribute to a shared sentiment of dispossession and hopelessness, which is felt by families, entire cultural groups and the community at large. This results in consequences such as historical trauma and, more specifically, inter-generational substance abuse that has evolved to include deadly opioid-using habits over time. Understanding the basic pharmaceutical pathways that occur when opioids act upon the body reveals a connection between physical and emotional pain and the conditioned associations that often lead to relapse. A society must also reconcile the utility of pain, which serves the purpose of communicating when a problem is present. Such pain signals may stem from deeper biological, psychological or social origins, and each factor must be evaluated for its potential role in opioid addiction and overdose and should be carefully considered in treatment. When pain becomes too great for someone to overcome individually—when they begin to drown—the community is indispensable. Some must stay to rescue, and others must travel upstream to pull others out, before the water rises above their heads.

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