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UNIVERSITY OF WATERLOO

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Community Policing in Action:
A community-based approach to reduce unnecessary police contact
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DEAR READER...

Welcome to the first issue of the brand-new University of Waterloo (UW) Journal of Undergraduate Health Research (JUHR)! Back in May 2021, we spoke to students across various faculties with an interest in health research and recognized a common challenge faced by the majority: the limited opportunities to publish research works as an undergraduate student. Unfortunately, there were few existing initiatives on campus for students to publish and share their health-related research works with a broader audience. As a result, JUHR was founded in May 2021 to provide an opportunity for UW undergraduate students to have their research works undergo an extensive peer-review process and eventually be published.

The inspiration for JUHR came from current undergraduate journals at nearby universities related to the fields of health and life sciences. We are incredibly grateful to the McMaster Sciential journal members who helped guide us in kick-starting JUHR.

In this Fall 2021 issue, we explore a range of health-related topics, from COVID-19 vaccine hesitancy to the opioid crisis. Arden Grace Fenton guides readers through a comprehensive evaluation of the Waterloo Region Police Service's Community Resource Officer Program, while Vanessa Geitz presents a narrative analysis of the experience of older adults. Through a series of opinion pieces, Precious Nwaka, Zinnia Chung, Francis Fernandes, Mahmoud El Mabrouk, and Zahra Mohamed discuss highly relevant issues facing the healthcare system today, including COVID-19 vaccine hesitancy, scientific misinformation, and genetic engineering. Aida Zaheer explores health disparities in the United States relating to maternal morbidity and preconception care. In total, seven articles are included in this issue, all authored and reviewed by students at UW.

We would like to extend our sincerest gratitude to the JUHR Editorial, Creative, and Administrative Teams for their exceptional contributions toward this journal issue. The Editorial Team led an exceptional peer-review process to maintain utmost research integrity, while the Creative Team effectively created a cohesive brand behind JUHR and beautifully designed this issue. A special thank you to Kimberly D'Mello (Creative Director), Megan Dol (Senior Editor), Takuya Shibayama (Senior Editor), and Fiona Thi (Secretary) for their outstanding leadership in guiding and supporting all team members to successfully execute the creation of this issue. Thank you as well to our faculty advisors, Drs. Diane Williams, Ellen MacEachen, & Craig Janes, along with Digital Repositories Librarian Jordan Hale and others from the UW Open Journals System team.

We encourage all undergraduate students at UW with an interest in the interdisciplinary field of health research to contribute to JUHR and share their work with students and faculty members alike. This issue only scratches the surface of what UW students have to offer, and we are excited to continue sharing student-authored research articles in many issues to come!

Sincerely,

Tara Behroozian & Shayanne Thomas
CO-FOUNDERS AND EDITORS IN CHIEF

VACCINE HESITANCY
A SELF-INFLICTED WOUND

Francis Fernandes, BSc[1]
[1]Health Sciences, University of Waterloo, a46ferna@uwaterloo.ca

ABSTRACT

The incidence and prevalence of COVID-19 within Canada continues to be fought most extensively using mass vaccinations. Such vaccines, which have been Health Canada approved, have been shown to be efficacious and effective in protecting against COVID-19. Despite such evidence, 1 in 5 Canadians are reported to delay their acceptance of COVID-19 vaccines or outright refuse them, exhibiting a phenomenon known as vaccine hesitancy. Amongst the many factors that lead to vaccine hesitancy, poor health literacy is thought to be a major precipitating factor. This paper argues that the overwhelming lack of health literacy exhibited by a large percentage of Canadians has resulted in the large presence of vaccine hesitancy. Unless aggressively managed using national policy implementation, poor health literacy can facilitate a greater number of avoidable negative health outcomes.

INTRODUCTION

The overwhelming prevalence of COVID-19 was simultaneously met with humanity's effort to halt such a deathly progression – the fruit of such effort being the COVID-19 vaccine. Vaccinations remain the most effective public health intervention against infectious diseases,[1] including COVID-19.[2] Since the first administration of COVID-19 vaccines,[3] national vaccination efforts have resulted in over 70% of eligible Canadians being fully vaccinated.[4] Despite this achievement, mass vaccination has revealed an alarming trend among Canadians – vaccine hesitancy.[5]

Nearly 20% of eligible Canadians[6] express delay in acceptance and/or the outright refusal of the COVID-19 vaccines despite widespread accessibility and availability.[5] Such findings are startling when considering the continuous public health efforts emphasizing the safety, efficacy, and preventative effectiveness of Health Canada-approved vaccines.[7] Clear indications of greater COVID-19 contraction and transmission have been established among unvaccinated individuals.[8] A substantial body of comparative data suggests greater rates of symptom expression, hospitalization, and death among the

unvaccinated.[10-11] Furthermore, increasing numbers of unvaccinated individuals heightens the potential of negative health outcomes among populations medically uncleared to receive vaccinations. For example, at-risk individuals with certain chronic illness(es) and underage children (e.g., infants) are more likely to contract COVID-19 through unvaccinated individuals who are more likely to transmit COVID-19 compared to vaccinated counterparts.[9] Given the growing prevalence of COVID-19 vaccine hesitancy among Canadians and the described consequences facilitated by the lack of vaccine-uptake,[9-11, 12-14] the phenomenon of vaccine hesitancy among Canadians calls for analysis and investigation.

FACTORS ASSOCIATED WITH COVID-19 VACCINE HESITANCY AMONG CANADIANS

There are several contributing factors to vaccine hesitancy. Demographic factors, such as education, ethnicity, income, and employment, are strongly related to vaccine uptake.[15] Specifically, unvaccinated Canadians are more likely to reside among rural communities, racialized communities and/or low-income neighbourhoods. Similarly, racialized, ethnic-minority and Indigenous groups were more likely to express vaccine hesitancy, highlighting a clear socio-cultural divide.[16]

Differences in personal responsibility and risk perceptions among individuals are also associated with vaccine uptake. Lower perceptions of disease severity and incidence were associated with lower likelihoods of vaccination.[15] A number of Canadians cited low concern regarding COVID-19 severity/ spread as a rationale towards remaining unvaccinated.[16] Moreover, mistrust of the government and large institutions were additional key factors for not receiving vaccinations.[15] The sporadic nature of repeated lockdowns/re-openings have been reported to increase institutional mistrust among Canadians when compared to pre-COVID levels,[17] thus inducing greater negative perceptions on the effectiveness of vaccines.

Furthermore, drastic increases in hyperconnectivity as a function of social media usage has exacerbated the volume of shared medical misinformation – a key predictor of poor risk perception and compliance[18] associated with vaccine hesitancy.[15] Notably, 96% of Canadians have encountered COVID-19 misinformation online, yet only 21% have admitted verifying the accuracy of such information.[19]

The interplay between the aforementioned factors complicates the surging problem of vaccine hesitancy.[15] A closer analysis of these factors presents a commonality, providing insight towards effectively addressing and understanding the problem of hesitancy – that commonality being poor health literacy.[20]

HEALTH LITERACY AND VACCINE HESITANCY

In context to vaccine hesitancy, health literacy is an established predictor of social behaviours associated with COVID-19 vaccine hesitancy.[20-22] Poor health literacy highlights the inability of processing and understanding health information often leading to inappropriate, undesirable health decisions.[20] In regard to the COVID-19 pandemic, inadequate/poor health literacy may manifest in many different ways: an exclusively harmful view on COVID-19 vaccines,[23] low/no-adherence to public health measures,[24] low perceived disease severity, citing social media and/or pseudoscience as primary sources of information,[24,25] etc. Notably, poor health literacy is often observed in rural, low-income, racialized and/or indigenous communities where the rates of vaccine uptake are significantly lower.[26] Such an observation strongly suggests that poor health literacy is associated with vaccine hesitancy.[27] The establishment of this connection is imperative towards understanding heightened vaccine hesitancy as well as addressing and eliminating it.

Presently, 60% of Canadian adults and 88% of Canadian seniors lack adequate health literacy.[26] Seeing as Canadians have long suffered from a health literacy crisis, the catastrophic rise of vaccine hesitancy during COVID-19, is pinned to a continually

neglected health literacy issue. The perpetrators of this neglect being the Canadian government.

WHY THE CANADIAN GOVERNMENT IS TO BLAME

For decades, health literacy has and continues to be recognized as a matter of national importance by the Canadian government.[28] Despite such recognition, little to no policy has been implemented to curb poor health literacy rates nationally.[29] Notably, the Canadian Public Health Association (CPHA) has continually advocated for the importance of addressing and developing policy recommendations to reduce poor health literacy rates.[30] A decade since CPHA's recommendations, no polices or mandates on reducing health literacy have been implemented on a federal scale.[29] Consequently, health literacy remains as an issue of national importance.[28] Given health literacy's strong association with vaccine hesitance, governmental inaction to improve poor literacy seems to have exacerbated the public's fear of receiving vaccines.

The growing burden of vaccine hesitancy has been acknowledged by multiple levels of government. Interventions to reduce the growing hesitancy are currently being implemented.[31] For example, ethnic-centred clinics geared towards few minority groups (e.g., Indigenous, Black, LatinX, etc.) were established and operated in select communities around the nation . The purpose of such clinics included lowering vaccine hesitancy among minority groups using culturally translated health education resulting in some success.[32-35] The implementation of ethnic-centred clinics appeared to benefit vaccine uptake in smaller communities.[32-34] However, interventions centred around smaller, specific cohorts of Canadians are ineffective in addressing vaccine hesitancy in a larger national capacity.

Unlike vaccine hesitancy,[32-24] no health literacy focused interventions were implemented.[29] Such government inaction to improve health literacy enables many Canadians to misunderstand and misperceive the utility and importance of COVID-19 vaccinations. Other manifestations of poor health literacy (e.g., poor adherence to public health interventions, low disease severity, etc.) as mentioned previously, may continue to increase if Canadians lack skills to decipher basic health information to make appropriate health decisions [23-25]

The presented perspective makes it clear that our government's continual inaction on health literacy cuts deeper into the self-inflicted wound of vaccine hesitancy. Recognition of a health literacy crisis by our government is meaningless unless directly followed by serious discussion and subsequent policy implementation on a national scale. If left unaddressed, inadequate health literacy will persistently haunt our nation. Poorer health outcomes, reduced life expectancies, and increased strain on an already burnt-out healthcare system are possible futures we currently face as Canadians,[36] all at the expense of government inaction.

Conflict of Interest: The author, Francis Fernandes, is an editor on the JUHR Editorial Team but had no involvement in the peer-review process or decision to accept this article.

Keywords: Vaccine Hesitancy, Health Literacy, COVID-19, COVID-Vaccination, Canadian Government

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COMMUNITY POLICING IN ACTION
EVALUATING THE WATERLOO REGION POLICE SERVICE'S COMMUNITY RESOURCE OFFICE PROGRAM

Arden Fenton, BSc; Kelly Anthony, PhD[2]

[1]Health Studies, University of Waterloo, agfenton@uwaterloo.ca; [2]Social Psychology, University of Houston

ABSTRACT

The Waterloo Regional Police Service's Community Resource Officer (CRO) program is a 911 call diversion program that redirects high-need individuals from traditional policing towards a specialized police unit. This unit was designed to decrease incidents reported by services and community members by connecting program users to existing community services. Through conducting an impartial evaluation, this study hopes to determine the CRO program's effectiveness and improve the CRO program and its utilization of associated programs. This study will perform and analyze interviews of stakeholder opinions and feedback and create a program logic model for future program development and evaluation.

Interviews were conducted with 12 CROs and five social service employees. To determine the effectiveness of the program, a second phase of the study will be required which will include program user opinions and quality indicator development. Based on phase one interviews, a logic model was created, and strengths and weaknesses were analyzed. Program strengths include connections to services, access to the target population and adaptability. Some program weaknesses include low community awareness, low resources for community needs, and vague roles/responsibilities. These weaknesses can be resolved through external publishing, increasing resources, formalizing the program, and additional training.

INTRODUCTION

Traditional policing models have once again been brought into question as the militarization of the police and allegations of excessive force became contentious topics once again in the last year.[1] This recent bout of questioning, in part driven by the Black Lives Matter movement, has caused many in the region and around the world to demand the defunding of police and/or the reallocation of police funds towards community initiatives and programs. [2, 3] In response to this sentiment, some would argue that there are already multiple alternative policing programs within the police force that focus on community improvement. Many of these programs run in conjunction with regular policing to protect and assist vulnerable people within the community. With current policing practices coming under fire,[4]

academia is well-positioned to investigate the effectiveness of these alternative policing strategies and their impact on the community. The arm's length evaluation of alternative policing strategies is necessary for evidence-based policing or responsible fund reallocation, both within and outside the police service.

For the past 25 years, the Waterloo Regional Police Service (WRPS) has run the Community Resource Officer (CRO) program. The CROs serve the most vulnerable people, at an individual level, within the Kitchener-Waterloo region by providing connections to community resources and acting as a consistent point of contact for those facing persistent challenges. Those who interact with CROs typically experience chronic homelessness, poor mental health, domestic violence, and substance use, among other problems. For this reason, CROs are trained to deal with these high-stress scenarios and connect those in crisis with community programs that support their needs. The CROs accomplish this through collaborating with community/non-profit program providers. Knowledge surrounding the CRO program has been primarily transferred from officer to officer through job shadowing and apprenticeship in addition to the aforementioned training. Because of this approach to onboarding and knowledge translation, little has been recorded or shared with the community in any formal way regarding the CRO program's purpose, logic, and impact.

While this program has been considered highly valuable by the WRPS, it has yet to be formally evaluated. Through this study, the research team hopes to provide the WRPS with an impartial evaluation of the CRO program to outline its framework properly, assess its effectiveness, take note of its strengths, address areas for improvement, and disseminate these findings. The CRO program is not the only of its kind within Canada. Various similar programs have naturally emerged in different police departments; however given the limited number of articles found during the literature search for this project, it appears that very few third-party evaluations have been published on these programs. As a result, there is little to no basis for whether these programs are worth funding or replicating. It is essential (and timely) that we evaluate the CRO program as such a longstanding program would serve as a basis for designing or improving other similar programs. This study is one of the first to evaluate the effectiveness of this program format and will be extremely useful as a basis for how to evaluate similar programs.

COMMUNITY-BASED POLICING

Community-based policing, described as a community relationship-focused policing strategy, has been in greater demand in the last few years as tensions between the police service and citizens rise. Community policing strategies emphasize the quality of life for civilians by developing partnership dynamics and a problem-solving approach.[5] According to Skogan and Hartnett, components of community-based policing include the diffusion of authority within police service, the focus on problem-oriented strategies, facilitating and encouraging the community to take part in police policy decision-making, and empowering citizens to participate in crime prevention.[6] Common goals of community-based policing include the reduction of citizen fear of crime and community disorder and enhancing the citizen trust and attitudes associated with the police service.[7,8] In summary, community-based policing is a human-centric relationship. This is apparent when contrasted to traditional policing approaches that act with little collaboration and focus on resource inputs and short-term outcomes.[9] While 85% of police jurisdictions in the United States have claimed to or will be adopting community-based policing,[10] very few that had claimed to practice community-based policing had all key components of community policing.[8, 11]

The concept of community-based policing is not new; it started being implemented in the United States in the 1960s in response to widespread discontent and a lack of community connection with the police.[5] While it is hard to measure the impact of community-based policing as a philosophy, there are different initiatives that are directly evaluated for effectiveness. Evidence

surrounding community policing initiatives has had mixed results regarding changes in officer satisfaction and reducing citizen fear of crime; however, there has been a strong association between community-based policing initiatives and general crime reduction.[12]

POLICE CALL DIVERSION PROGRAM

To date, the core of the CRO program is based on 911 call diversion. Using 911 call data or referral, individuals are identified and then analyzed for community service need. Little research has been published on 911 call diversion programs due to the fear of underwhelming results.[13, 14] There are two key publications on police call diversion programs that help to inform important features of this evaluation.

The Crisis Assistance Helping Out On The Streets program, also known as CAHOOTS, was established in Eugene, Oregon, USA in 1989.[15] Launched to provide crisis intervention in nonviolent situations, CAHOOTS diverts 911 calls away from police and towards a specially trained team including a crisis worker and medic (being a nurse, paramedic or EMT).[14] These teams provide a broad range of services, including crisis counselling; suicide prevention, assessment and intervention; conflict resolution and mediation; grief and loss counselling and associated services; substance abuse mitigation and reduction; housing crisis provision; first aid and non-emergency medical care; resource connection and referrals; and transportation to services.[16] Generally speaking, this program has been seen as the template to start 911 call diversion initiatives as it has been proven to be financially and socially responsible. As of 2017, approximately 17% of the Eugene Police Department's overall call volume was redirected to CAHOOTS; this led to an estimated savings of $8.5 million in public safety spending per year.[17]

The Support Team Assisted Response pilot program, also known as STAR (Support Team Assisted Response), ran in Denver, Colorado between June 1st, 2020, and November 30th, 2020.[18] Inspired by CAHOOTS, STAR dispatched teams of health professionals and social workers to aid in incidents of intoxicated persons, police requested assistances, indecent exposure, welfare checks, suicidal series, trespassing or unwanted persons, syringe disposal (HRAC), and transportation to services.[18] Out of the 2576 calls eligible, 748 incidents were handled by STAR teams.[18] Overall, these had an average on-scene personnel time to resolution of 24.65 min for STAR teams, whereas regular police had an average of 34.08 min for regular police response.[18]

THE HUB MODEL AND SITUATION TABLES

The umbrella of community-based policing initiatives is wide and diverse. Because of this, the goals and formats of these initiatives vary greatly.[12] For the WRPS, the CRO Program is integrated into the 'Hub' model of intervention. The Hub model is an upstream risk-mitigating approach to connecting complex risk clients to services.[12] Composed of health and community service providers, specialists in various disciplines meet to assess and identify the needs of complex, high-risk clients to provide intervention before a harmful event occurs.[12] This cluster of collaborating health and community service providers, known as a situation table, has been named Connectivity in the Waterloo region. The Hub model has three major components - risk detection, discussion of solutions, and the provision of intervention. With the CRO program being incorporated into Connectivity, this is the primary pathway that the WRPS uses which connects users of the program to the services they need. The CRO program has referred 73% of cases assessed by Connectivity to bring its users to the services they need.[19] The CRO program primarily works in the risk detection and discussion phases of the situation table. This benefits both the users, of which 76% get the services required for their situation to be addressed,[19] and the WRPS. In the Waterloo region, 80% of police calls were classified as non-criminal and therefore are more likely to be preventable with intervention.[19] With the implementation of Connectivity, there was a 46% reduction in repeat calls over 90 days; this reduction alone freed up an estimated $100,000 of relocatable funds.[19] Early outcomes surrounding the

implementation of situation tables have shown the following benefits for the community: increased and faster introduction to services;[20,21] stronger knowledge of client needs;[22] better communication and client flow between services;[19,22] improved client-provider relations;[24] and reduced barriers within and gaps between services.[19]

RESEARCH PURPOSE, AIM, AND OBJECTIVES

When conducting a program evaluation, implementing a hypothesis would be introducing bias through the introduction of expectations. Conducting an impartial evaluation is an exploratory and evolving practice that requires flexibility that a hypothesis does not allow. For these two reasons, this study was driven by the evaluation's research question rather than the traditional hypothesis. Through conducting an impartial evaluation, this study hopes to understand if the CRO program is effective. Additionally, this study hopes to improve the CRO program and its utilization of associated programs. This study's objectives include performing and analyzing interviews of stakeholder opinions and feedback and creating a program logic model for future program development and evaluation.

Very few systematic studies have been conducted on community-based policing, despite the extreme popularity and widespread nature of the approach. This scarcity of knowledge has extended into community-based policing initiatives due to the fear of underwhelming results.[14] This thesis will aim to address this gap by conducting an evaluation of a unique and long-standing community-based policing program. Through this study, a description of this program has been provided and was analyzed to identify strengths and weaknesses. Prominent and promising features of success can then be implemented in new and innovative programs, while the hazardous qualities can be avoided. While both STAR and CAHOOTS have displayed promising results, neither quite fit the model of the CRO program as police calls are rerouted to a specialized unit rather than an alternative service or discipline. These programs have remarkably similar goals and

targeted services, which can inform the CRO evaluation on what is typically impacted by 911 call diversion programs. Due to the popularity of the Hub model, some evaluations help us to better understand the nature of Connectivity's relationship with the CRO program. With this stronger understanding of the Hub model, there is the possibility that interactions with or features of Connectivity's relationship with the CRO program will be discovered through this evaluation. If found, relationships and interactions between the CRO program and Connectivity can lead to better and more efficient partnerships between the police service and different forms of the Hub model.

METHODS
PARTICIPANTS

CROs and adult members of the community were recruited for interviews regarding their interaction with the CROs as a citizen or a community program provider from within the Waterloo Region. Interviews were conducted with 12 CROs and five social service employees. No additional inclusion criteria other than some level of involvement with the CRO program was specified for the interviews as a holistic community perspective is desired. No exclusion criteria were specified.

De-identified police call data were analyzed in an exploratory fashion to identify key quality indicators as a basis for evaluation in addition to maintenance-based monitoring of the program post initial evaluation. To be included in this data set, participants must have had a formal interaction with a CRO in which a report was filed. No exclusion criteria were specified for the archival data to ensure bias was not introduced by excluding a subgroup of program users. As of publication, this analysis was still being conducted for phase 2 of the evaluation.

POLICE INTERACTIONS DATA

Provided by two volunteer CROs, three months of prospective interactions were self-reported with the objective to create quality indicators for the evaluation. To ensure confidentiality, data received by the research team were de-identified. Seventy-

nine interactions were reported with 25 elements each, including information about perceived demographics; general location, reason, and referral source of interaction; severity and complexity of the case; relation/use of other services; and program user attitudes toward police. It was not linked to any other database or alternative information that could lead to re-identification. The data provided was stored on a secure password-protected University of Waterloo server for at least one year after use. No additional consent from individuals in the database was required.

Prior to publication, quality indicators have yet to be formulated. Based on the logic model determined by the interview analysis, both direct and indirect quality indicators will be created to measure the desired outcomes and goals of the CRO program within phase two of the study. With the wealth of data provided by the CROs, we will see current trends among variables that may be metrics for success. To be in line with the CRO program's goals, metrics that indicate reduced 911 call volumes or increased provision of services will be considered successful. Without quantitative indicators for program evaluation, there is an extreme risk of bias due to the overreliance on qualitative measures such as testimonials. Therefore, the evaluation would lack the evidence it needs to ensure that the program is working if it moved on with interviews alone. A combination of exploratory discussion with the CROs and the logic-driven analysis of the police record data will be used to find valid quality indicators that can be monitored to view the program's effectiveness over time. Not all portions of the framework will have a quality indicator due to time constraints; however, the indicators proven to be valid and maintainable will be kept. Additionally, this data will be applied to describe the users of the CRO program, their needs, and the services used. This will be used as a statistical basis to drive training, resource allocation and evolution of the program to best fit users' needs. For this phase, the data collected was used to describe the current state of the CRO program and provide some context to the information provided within the CRO interviews.

INTERVIEWS

Recruitment of participants was sourced through the WRPS network of contacts and by the Community Roundtable and local social service agencies. These individuals were identified as CROs, important community stakeholders, users/beneficiaries of the program or Connectivity table members who have interacted with or have been affected by the CRO program. The WRPS made initial contact on behalf of the research team using a recruitment script. One of two recruitment scripts were sent via email. These scripts vary in content as they were customized to suit our two categories of participants: users of the program and community program providers that interact with the CROs. Participants then contacted the research team directly, indicating their desire to participate in an interview.

Approximately one-hour, semi-structured one-on-one interviews were conducted to gather and analyze stakeholders' opinions and feedback on the CRO program. Due to COVID-19 restrictions limiting physical meetings, the research team interviewed participants via Zoom™, Microsoft Teams™ or by phone. The research team provided interviewees with a consent form to inform them about the purpose of the study, procedures, information on their right to decline or withdraw from the study, and potential risks involved during the interview process. At the beginning of the interview, verbal consent and consent to record was obtained by reading the interview script. If consent was not obtained, the interview was stopped. These interviews followed the prompts as laid out in the interview script and proceeded based on participant comments. Guided by the interviewee's responses, questions were asked regarding clarification or to get a more nuanced view of their perspective. Once the interview concluded, the interviewer then debriefed the participant by thanking them, going over the debrief form and offering them a virtual copy. Post-interview, the audio recording was censored of identifying information (such as names, addresses etc.) and labelled via participant ID number before being stored on a secure password-protected University of Waterloo server for at least one year after use.

As specified in the consent form, in addition to the verbal script, refusal to answer a question or requesting to be withdrawn from the study was permitted at any point in time during the span of the interview. Under the circumstances that the participant withdrew from the study, they were asked if they wished to have their previously provided comments removed from later analysis. If yes, then the recording was securely disposed of immediately upon the call's conclusion. Shortly after the conclusion of the data collection phase of the study, a formal appreciation email was sent, including a statement of appreciation, details about the purpose of the study, restatement of the provisions for confidentiality and security of data, an indication of when the report will be available, how to obtain a copy of the report, contact information for the researchers, and the ethics review and clearance statement. Another similar message of appreciation was sent upon publishing the report, indicating that it could be viewed.

These audio recordings were analyzed via reflective thematic analysis, which identifies meaningful theme patterns.[25] Because of the evaluation's exploratory nature, the use of thematic analysis was selected due to its flexibility and high compatibility with semi-structured interviews.

ETHICAL CONSIDERATIONS

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE# 42547). Given that we are working with the police, coercive power dynamics were an area of concern. This was especially true if recruitment of community members occurred through their current CRO officer. Thus, recruitment was sent out by the research and statistics division in the WRPS. While it was still identifiable as a police contact, this removed some of the power dynamics that occurs when officers are invited to participate through their supervisors. There were also concerns of power dynamics as superior officers may influence the CROs responses. Understanding these, each part of this evaluation emphasised that all participation was voluntary and that no information in an

identifiable form was provided to the WRPS. While recruitment had to go through the WRPS, all forms of participation information were inaccessible to them. This helped to ensure anonymity. Given that sensitive topics were brought up during the interviews, participants were informed of the proper withdrawal procedure to inform them of their rights. There were no additional ethical concerns regarding the use of police interaction data given the procedure established above.

RESULTS
POLICE INTERACTION DATA

The interactions between the CROs and program users occurred mostly within the community members' homes (45%), within the broader community (30%), or over the phone (25%). Through interviews, it has been noted that temporary shelter sites within the region such as ABTC/Lot 42 may not call 911 due to a tumultuous relationship with police. Thirty-seven percent of interactions had previous CRO involvement 60% were new to CRO aid, and 3% were unknown. These interactions were all conducted in English. The majority of the programs had unknown race or ethnicity, according to the CRO officers reports. Approximately 10% of CRO program users are a case on the connectivity table.

INTERVIEWS

Interviews were conducted with 12 CROs and five social service employees. Through the CRO interview questions relating to the general functioning of the program, the following framework was created. These questions included information regarding the general context surrounding the program and the program's core components such as its purpose, inputs, activities, outputs, and effects. The CRO programs' relationship to Connectivity was also illustrated within the logic model below as they directly contribute to each other's success. Details surrounding the Connectivity's logic model was sourced from Newberry & Brown's Connectivity program evaluation.[19] Future use of this logic model will include integrating quality indicators as developed through police interactions data.

The CRO Program was seen positively by all CROs and considered a necessary component of community policing. The program itself was considered only as strong as its bidirectional connections with community services. As a result, CROs enjoy the more stable hours associated with the role as it helps in communication with these community services. Additionally, a major concern of the CROs includes the lack of adequate and effective resources to address mental health and addiction. Because of this concern, four of 12 CROs have indicated that they would like to have more Impact workers/support. According to nine CROs, a lack of public awareness makes it hard to address community needs. This is particularly difficult with the current negative public perceptions of police; however, this issue could be mitigated with alternative uniforms or plain clothes. While this does afford the CROs more flexibility in their role, they have indicated that they take on tasks that do not necessarily fall in line with the program's intended purpose.

The unclear jurisdictions and role ambiguity makes the CRO program a "dumping ground" according to four CROs. Additional CROs have been recommended as the small size of the program is still not able to support the vast and exacerbated need of the community. This recommendation is supported by five of 12 CROs. Because of the attitude shift around policing, many CROs struggle with the cancellation of other related police programs, such as the School Resource Officer (SRO) program, which was closed as of June 2021.[26] This has been a struggle for CROs as the removal of these supportive services may lead to the gaps in service that the CRO must fill.

Nine of 12 CROs' indicated a desire for some additional training; some recommendations included: introductory training for community resources, mental health education (e.g., de-escalation training, suicide prevention, and diagnostic information), public speaking/political training, communication and active listening, crime

Figure 1: Joint logic model of the CRO program and Connectivity, including their interactions and overlap.
`Contextual information was provided by WRPS.
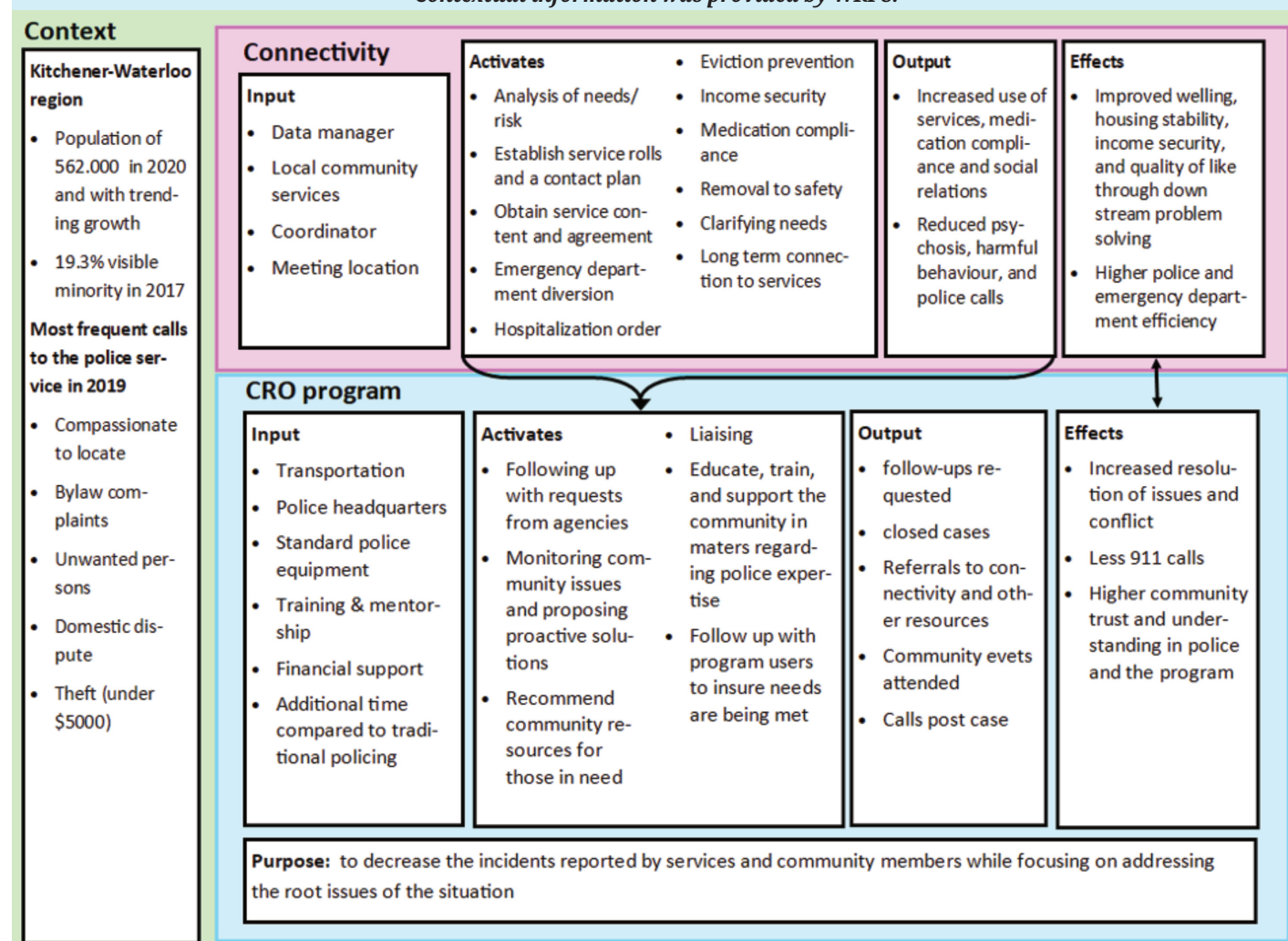
prevention through environmental design (also known as CPTD), relationship building, and diversity training. Generally, there was a positive inclination towards more consistent workshops to both update and access more training opportunities.

Social service support employees agreed to speak about their work with the CROs. Their responses were uniformly and strongly supportive. These included those working in crisis services at hospitals, community health services, legal and housing services for those living with significant mental health, housing, and/or addiction challenges. They reported that the primary difference was the CROs ability to build relationships with vulnerable community members using compassion, superb listening, and de-escalation skills, among others. They all saw the CRO program as critical in meeting the needs of our community's most vulnerable. They all reported that the CROs appear to be uniquely qualified to deal with the often urgent and sometimes risky situations of those suffering from mental illness and addiction. All five described the CRO involvement and work at the Connection Tables to be essential. They each felt that all police would benefit from the kind of training and skills the CROs demonstrate. Communication between agencies, including the CROs, provides social services a critical resource when working with our community's most vulnerable.

DISCUSSION

Within the limitations of phase one of the study, it is difficult to determine if the CRO program successfully achieved its goals. Without the quality indicators and additional interviews from the program users, all that we can discuss are the internal operations of the program and the CRO and social service provider perspective. With phase two of the study, we hope to better analyze the effectiveness of the CRO program with this holistic perspective.

Based on the results of this study, a few recommendations can be made to improve the program. Given the bidirectional relationship between the CRO program and community services,

promoting stronger relationships with these services are bound to improve the CRO program. The CROs themselves have indicated the desire for introductory training for community resources and additional relationship-building training, which would improve these relationships during staff transitions. Further outreach to these services through regular collaboration with officers could improve relationships (e.g., police service participating in weekly soup kitchen activities).[27] By integrating the CROs into social services, they are able to respond to the needs of the service faster and more efficiently while also having more knowledge of the service when it comes to connecting program users.[27] To accomplish this level of integration, more staff is needed within the CRO program. Considering the increasing number of program users, increased staffing levels would also improve access to the program and reduce wait times.

Additional CRO training could improve communication and interactions with these services. For example, mental health education (such as de-escalation training, suicide prevention, and diagnostic information) can help not only the CRO when interacting with users experiencing mental health crises, but also with services that commonly interact with diagnosed individuals.[28] Having common terminology and understanding of issues promotes smoother knowledge transfer, a crucial factor when dealing with emergency situations.[28]

Public speaking, political, diversity, communication and active listening training can also improve knowledge transfer skills and reduce conflict when discussing issues or in crisis events.[29] Additionally, more training in areas that are commonly requested by services, such as CPTD, would strengthen the program's utility to social services. While CROs are more trained in these areas than traditional officers, the value in this training is indispensable; it should be considered that this CRO style training and experience could be beneficial for all sworn officers. While not every officer can become a CRO, these officers can at least be exposed to this style of policing through the continuation of the WRPS's onboarding process in which new hires spend two weeks with the

CROs.

Overall, these factors suggest that the program should be moving towards a larger, centralized, and more formal structure. In part, this could be accomplished by introducing a manual that outlines a clear CRO mandate and responsibilities, a program ombudsperson, a community oversight committee, and an arm's length research partnerships/ongoing evaluations and reports. Provision of these on internal and external platforms would also ensure transparency within the police force and the public.[30] External publications of CRO program information and activity can improve public relations surrounding the service.[30] Currently, there is no public-facing information on the program. For this reason, it is recommended that an engaging and accessible website be made by a professional web designer or expansion to the WRPS family of websites to share CRO work and stories with the public. This could reduce both speculation on the program's function and possibly create an avenue for program user outreach.

With the formalization of the program should come formalization of hiring practices. To date, there was remarkably little regarding formal candidate selection. As part of the next phase of the study, it is recommended that the WRPS and research team identify ideal attributes of CROs and assess all new CRO recruits on those dimensions. For example, this may be accomplished by using validated personality inventories such as OCEAN to assess the most desired community policing characteristics.[31] OCEAN is a self-report scale that measures the Big Five personality traits of Openness, Conscientiousness, Extraversion, and Neuroticism.[31] Through the use of scales such as OCEAN, the interview process becomes more objective, formalized and transparent to the public compared to the CROs previous non-standardized hiring practices.[31] Formalizing candidate selection, alongside the increased size of the program, can also be used as an opportunity to promote diversity within the CROs via targeted hiring.[32]

CONCLUSION

The allocation of funding regarding police programs is controversial. For this reason, solid rationale and evidence of program effectiveness are needed to obtain community and funder trust. As previously said, the creation of the CRO program has been a paperless trail with little to no documentation on the program's framework and activities. A lack of documentation makes it difficult to explain the program's value to stakeholders and funders or improve upon the program using evidence. With Phase one of the CRO program evaluation complete, this study has set the baseline for continued evaluation. The evaluation phase outlined the framework necessary to gain stakeholder and funder trust by outlining the program in a comprehensive and logical fashion. This evidence-based approach furthers and improves community trust as it supplies data showing whether the program supports its users' needs and evolves through the implementation of stakeholder feedback. Through the publication of this program evaluation, the findings, including the CRO program's potential strengths and recommendations for improvement are intended to be shared with the WRPS and other police-based program providers. Some strengths of the program include its connections with other services, access to the target population and adaptability. Some weaknesses of the program include low community awareness, low resources to address needs, and vague roles and responsibilities. These weaknesses can be fixed through increasing program awareness, increasing resources, formalizing the program, and additional training for CROs. By knowing the effectiveness of the CRO program's approach to community policing, researchers can better understand the positive or negative components of community policing as a whole and provide a broader wealth of knowledge towards evidence-based policing. Therefore, these findings and future findings in phase 2 may positively contribute to the CRO program, the Waterloo community, and other similar community-based police programs. Potential benefits include increased program effectiveness, increased community trust in the police, goal-oriented allocation of public funds, and improved health and social outcomes for citizens interacting with the CRO program. Later phases of this study will continue to pursue the effectiveness of

the CRO program through third-party evaluation with a program user perspective.

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Keywords: community policing, police diversion programs, program evaluation, mixed methods, community systems, social services

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SOCIAL MEDIA AND SCIENCE:
A DOUBLE-EDGED SWORD OF (MIS)COMMUNICATION?

Zinnia A. Chung, BSc[1]
[1]Faculty of Science, University of Waterloo, z4chung@uwaterloo.ca

ABSTRACT

Hailed as an indispensable tool for 21st-century communication, online media platforms have played major roles in the proliferation of knowledge worldwide. However, this new outlet of opportunity is not without its drawbacks to consider. With social media continuing to introduce new priorities to communicators, information becomes vulnerable to the fast click approaches to writing, sacrificing the quality of written work to achieve a wider digital reach. At the same time, healthcare professionals themselves become the subjects of scrutiny and distrust, competing with digital actors to share information with the public. Consequently, the negative side of social media makes itself evident amidst the recent global pandemic, illustrating the power that rumours may have on influencing overall health and safety. With this as the case, necessary conversations pertaining to the dangerous nature of social media must be held to both maximize awareness and allow for the avoidance of misinformation.

INTRODUCTION

Throughout history, communication has played a pivotal role in defining humanity's view of the wider world. From early storytelling to written works, the proliferation of knowledge has become a driving force behind society's continual advancement and growth.[1] Naturally, the modern era presents no exception to this pattern. Housing over 4.57 billion users worldwide, the internet has revolutionised the global community and redefined social interactions.[2] Now, with the number of social media users projected to reach about 42.3% of the world's population by 2022, a newfound audience of millions has become the norm.[3] With this as the case, whether by expanding social networks, facilitating large scale collaboration, or offering technological support, the internet has certainly introduced significant changes to its users' social, psychological, and physical experiences.[1] However, for health researchers, a double-edged sword of both

opportunity and risk awaits. While academic communicators are now able to both expand their reach and facilitate two-way public conversations, the open nature of the internet allows for an equal, if not greater, amount of misinformation to arise.[4] With this as the case, there is a clear need to understand social media, not only as a valuable communication outlet but also as a powerful tool that must be used with caution. With these newfound conversations leading the way, the importance of safe, effective digital communication can rise to the forefront of the online agenda and allow for positive progress.

DISCUSSION

Of the many benefits introduced alongside social media, the sensationalization of science was not one of them. Often, the nature of social media as a "fast-click" platform has led to the prioritization of

controversy, exaggeration, and shock value in research.[5] With scientific reporters presenting media in an emotionally charged manner, the resulting articles become pieces that are "highly surprising, and less likely to be correct."[6] In turn, this new approach has dangerous implications for the accuracy of research communication in the health field, as demonstrated by the inappropriate claims found with almost a third of the 525 papers in top obesity or nutrition journals.[7] Here, the use of language that indirectly implies the presence of a cause-and-effect relationship – most evidently in the abstracts and titles – demonstrates the widespread interest in benefiting from "click-worthy" language at the expense of content accuracy.[7] These new trends in academic communication are further as evidenced by research from Haber et al., where 34% of sample studies were found to use strong, e x a g g e r a t e d language and inaccurately reported results.[5] The fast-paced nature of communication on social media further places increased pressure on researchers to produce and report rapid results, potentially prompting the release of unfinished work onto the public stage.

With the threat of misinformation continuing to rise, the consequences of expanded, open platform sharing have also become increasingly evident in recent years. As the accessibility of the internet expands user networks, audiences that were once reserved for prominent media figures and professionals are placed within the reach of millions of online users.[8] Acting as a powerful tool for content creation, the internet thereby grants any user the ability to prominently share and popularize their

thoughts with the public. However, this may have unforeseen consequences, as demonstrated the vast array of misinformation that has manifested during the onset of the COVID-19 pandemic. As noted in an analysis by Van De Linden et al., over 25% of the most popular coronavirus videos on YouTube – reaching over 62 million views – were found to contain misleading content.[9] In turn, this misinformation becomes more frequently shared through Twitter when compared to credible public health or scientific content, subsequently distorting public attitudes with scepticism and encouraging dangerous behaviour.[10]

The divided public opinions on vaccinations act as a direct portrayal of this case, where the open nature of social media has created fierce competition between scientific facts versus fiction on the efficacy of vaccines.

Furthermore, while these instances of misinformation may begin as rumours, they have dangerous implications on the perceived credibility of legitimate information sources. As an example, the antimalarial drug hydroxychloroquine, was just one of the many misleading "cures" to COVID-19 that was widely circulated by internet actors and self-proclaimed "healthcare professionals." Despite being quickly disproved by follow-up studies,[11] the widespread discussion surrounding this rumour demonstrates how easily the pretence of trustworthiness can be fabricated in the online world. As this digital network continues to expand, the once-clear distinctions between licensed professionals and public users become increasingly difficult to identify. Audiences once reserved for credible organizations are now subject to information arriving from a vast array of sources, with each competing to expand their
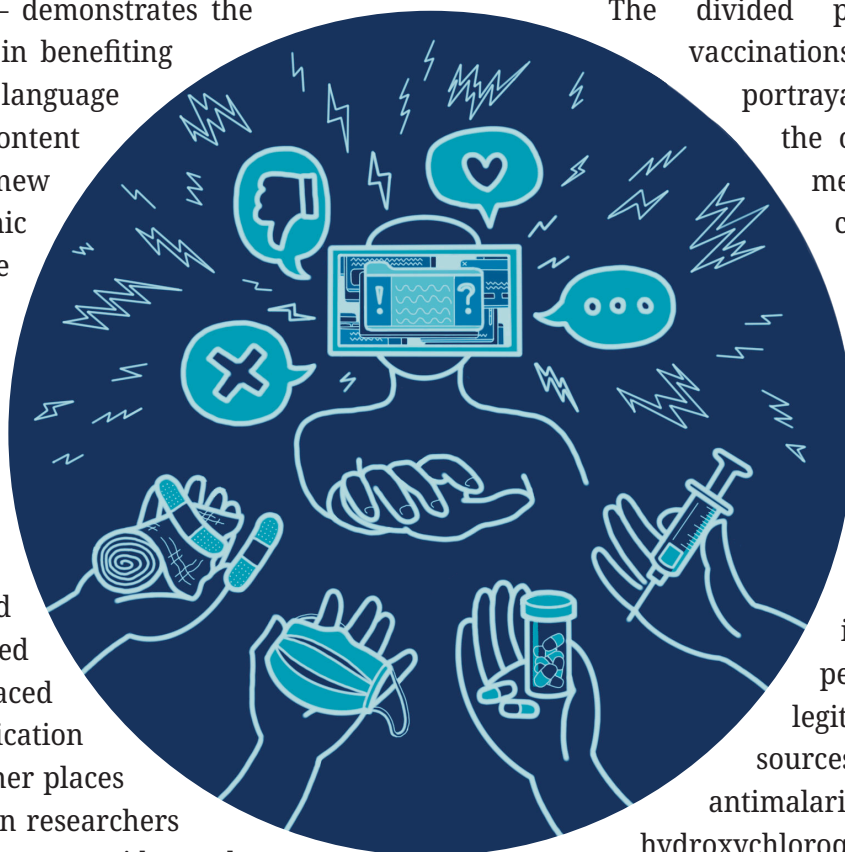
reach, influence, and impact on viewers.[12] The superficial nature of online authority only builds upon the issue, subjecting both parties—online actors and credible sources—to the intense scrutiny of the public eye. Consequently, the internet has become a maze of both truth and deception, serving to distort communication as opposed to enhancing it.

CONCLUSION

Evidently, in the face of a fast-paced online world, it is all too easy to become lost in the struggle to expand one's reach, meet public interests, and compete with the millions of other users on the internet. Therefore, it is essential to consider the tremendous potential of social media and the inherent risks associated. Moving forward, further investigation on the direct impacts of social media on public perceptions of science may be conducted on a more in-depth scale, exploring specific factors or techniques used to exert large-scale influence. This process can be formidable, but in transforming these challenges into opportunities for continued exploration, a future of innovation and truth will once again reclaim the online world.

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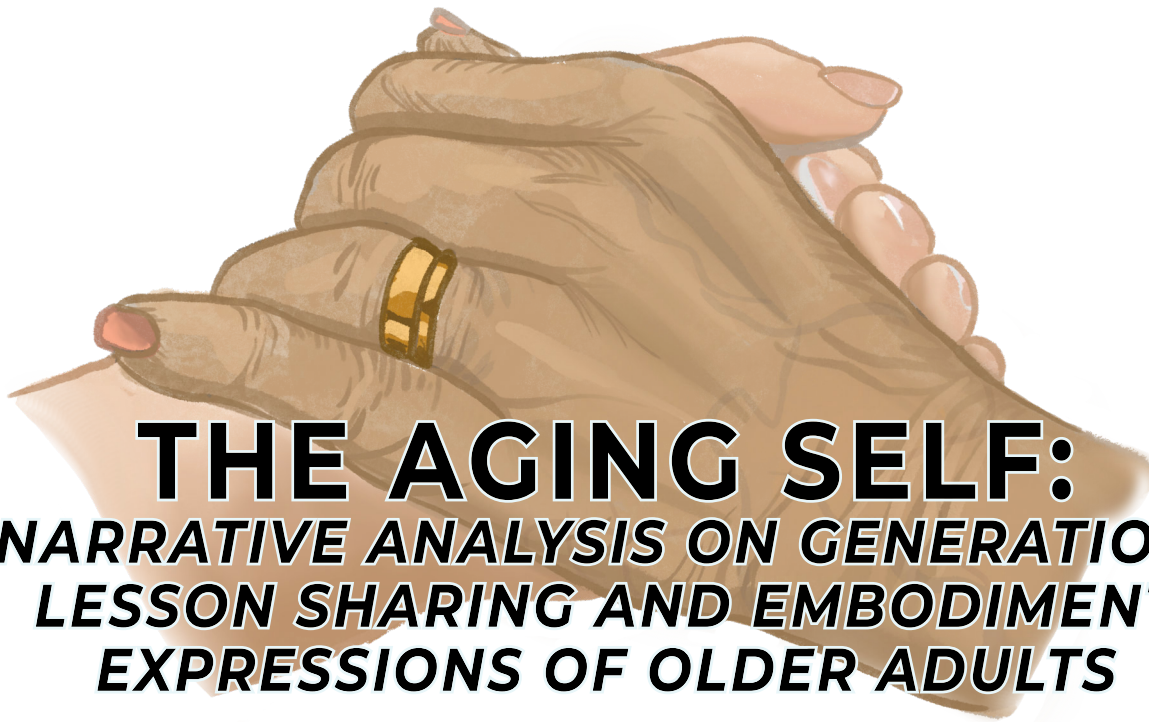
THE AGING SELF:
A NARRATIVE ANALYSIS ON GENERATIONAL LESSON SHARING AND EMBODIMENT EXPRESSIONS OF OLDER ADULTS

Vanessa G. Geitz, BPH

[1]Public Health, School of Public Health Sciences, vanessaggeitz@gmail.com

ABSTRACT

This qualitative study captures individual aging experiences, gaining insight into how older adults understand aging bodies and express age. Three main research questions were developed to respond to that inquiry: (1) How do older adults embody aging? (2) What life lessons are embedded in these expressions of age? And (3) What life lessons are beneficial for younger generations to know for their own aging experiences? The study employed a secondary data analysis of semi-structured interviews, initially completed without restrictions on age, identity, or experience for participant inclusion. Results were analyzed using NVivo software with a constructive narrative analysis focus. Narratives were grouped into three categories based on the time frame central to the interview: past, present, or future. Emerging narratives included being a student, worker, partner in marriage, parent, retiree, and immigrant. The findings demonstrate how different embodiment experiences emerge through reflective narrative construction and influenced lessons shared. These conclusions contribute to understanding how choices and experiences at different stages in the life course can influence the aging experience and how it is projected. Ultimately, the findings emphasize the role that the self and body hold on identity and self-expression for older adults.

INTRODUCTION

In a simplistic sense, aging has been defined as the aspects of individual loss and impaired function that continue on a decline until death.[1] As these developments occur, the body's awareness and perceptions of the changes influence actions taken and overall aging experiences.[2] With continued expectations of an expanding aging population into 2050,[1] many academics have begun to describe aging experiences beyond biology by focusing on the body and brain simultaneously.[3] Literature is moving towards a humanistic approach and studying aspects of *individual lives* due to prominent non-biomedical influences such as cultural norms and stereotypes.[4-6]

However, within lifespan and aging research,[7-9] *embodiment* has emerged as a quasi-developed theme to better explain how individuals understand, absorb, and then express aging beliefs. In general, embodiment considers the three-fold interaction of cognitive function, the physical body, and the environment to make connections about situational outcomes in domains such as language, memory, attention, and action.[9] In practice, embodiment studies tend to be interested in how perceived abilities, motor skills, and cognition interact and impact routine activities such as peer interactions, throughout human development.[2]

Henceforth, the study's goal is to examine the embodiment of aging through the construction of life story narratives to illuminate individual older adult experiences. The research aims to capture aging realities and any cognitive, bodily, or social developments that impact an individual's self-perception of age. With health promotion of older adults primarily focused on dieting, exercise, and therapies,[1] this research aims to provide additional, meaningful evidence focused specifically on *experiences* of aging rather than on identifying suggestions for behaviour change.

LITERATURE REVIEW
EMBODIMENT

The term *embodiment* focuses on occurrences within the body,[6] as well as how the physical body is used to access the world and its surroundings.[7] Embodiment research, such as Bury's 1982 study, has explored illness experiences like Rheumatoid Arthritis and the impact of progressive symptoms to understand how individuals grasp biological changes.[6] The conclusions found that in males, body perceptions and functionality influence how age is individually understood and then performed externally.[6] Similarly, Dumas et al.[4] conducted an empirical study on older women's perceptions that showed similar embodiment phenomena. Across participants, regardless of social differences such as socioeconomic status, results showed that the value linked to bodies changes with age[4]. Some participants replaced younger beauty norms, such as dying hair,

with ones that matched their aging bodies.[4] The findings emphasized a lower daily interest in appearance over time, as the participants adopted a more relaxed approach in social life.[4] Moreover, the concept of subjective age aligns with embodiment as aging identity is paired with group-assigned social roles.[5] Monumental life changes such as retirement or losing a spouse also impact a subjective or perceived age, decided upon by the individual.[5]

SOCIAL IMPACT

Even more, the social aspects of aging have become another profound focus in gerontology studies.[4,10] Research has drawn on identities, societal barriers, changes with social roles, connection-making, and accessing support in social environments to address the social impacts.[11]

In studying Arab immigrant women, Salma et al. demonstrate how a lack of access to social supports impact an individual's perceived ability to overcome barriers.[11] These barriers often determine life satisfaction.[11] In addition, a lack of social contact and connection leads to social isolation and loneliness, resulting in reports of overall low aging satisfaction.[5]

Notably, the social life of older adults is largely shaped by the relationships in their immediate social circles, often with family, friends, and romantic partners.[12] Research on family resilience in later life has provided evidence of the role of coupled and intergenerational relationships.[12] Other influential socio-emotional bonds include community connections for older adults.[12] In addition to individually motivated acts of socialization, macro-level sociocultural norms like beauty and justice[4,13] also contribute to embodiment. Researching intolerance of age prejudice through social norms, Vauclair and colleagues identify the impact of these broader concepts of activism and morality.[13] Their findings reported statistical significance through the impact of emotions on age perceptions.[13]

Evidently, societies with a greater emphasis on ability-based social norms, such as conflict resolution, rather than chronological age, are better equipped to

recognize the talents and essence of all the population.[14] This distinction creates a more supportive aging environment.[14]

GENERATIONAL RESEARCH AND STORYTELLING

In addition to social elements of aging, research has also extended to more generational-based thinking that includes both the younger and older individuals' perspectives and wisdom.[10] With generational studies, there is often a familial or relational connection between participants and administrators.[10] The designs encourage a storytelling style, in attempt to further these bonds.[10] Therefore, storytelling with older adults *and* younger researchers provides the optimal opportunity for communication between individuals who both may be experiencing isolation and could benefit from structured social moments.[15]

Furthermore, aging research has developed many useful theories to explain how revisiting the past and speaking to current experiences develops an aging identity. Continuity Theory, developed by Robert Atchley in 1989, can assist in explaining the value of reviewing life stories.[10] Doing so impacts an individual's conceptualization of identity even through ability changes.[10] Continuity Theory presents that middle-aged and older adults try to *maintain* internal and external structures by using past experiences and social circumstances to hold onto an evolving identity.[16] Naturally, Continuity Theory acts as a guiding tool in aging studies by encouraging older adults to share experiences in research that simultaneously promote embracing identity.

Additionally, Socioemotional Selectivity Theory assists in explaining how older adults tend to recount memories through a more positive lens than younger individuals.[10] This theory, developed by Laura L. Carstensen, consider the whole lifespan, claiming that specific goals are motivators in social actions throughout the life course, regardless of age.[17] The 1995 foundational paper considers how life review and storytelling can be methods for emotional regulation.[10] As well, older adults can continue building social connections within specific age cohorts and those younger through sharing stories.[10] The use of this theory aids in creating an inclusive and more personal research experience by thinking of behaviour as social choices and the life story holistically, as opposed to linearly.[17]

LIFE LESSONS

In addition to life course review, *life lessons* about aging can indicate an older adult's subjective age. Subjective age entails an individual's perceived age primarily based on their feelings.[5] Additionally, the subjective age is based off comparisons to other figures who hold similar characteristics to the person.[5] With this self-constructed age, embodiment experiences are expressed through lessons that culminate participants memories and wishes for the future with a clear sense of how they see themselves. By sharing, older adults savour the lessons learned *because of aging*. Participants in reflective studies often realize the privilege of getting older, shifting to a positive view that inadvertently enhances well-being.[18]

AIMS

Considering the literature on aging, the proposed research questions are "How do older adults embody aging" and "What life lessons are embedded in these expressions of age?" to further understand these unique experiences. Additionally, "What life lessons are beneficial for younger generations to know for their own aging experiences?" will be used to assist in differentiating life experiences from life lessons in the analysis process. This question will assist in identifying key teachable moments. Considering the multi-structured design of the three primary questions, the thesis, therefore, has two distinct aims: to gain a deeper understanding of personal aging experiences *and* to adequately depict how older adults' realities can inform aging outcomes into the future.

METHODS
QUALITATIVE DESIGN SELECTION

Qualitative approaches in social gerontology, specifically, have been integral to learning more about vulnerable and marginalized individuals on topics such as retirement processes, relationships and sexuality in older age, and independent living.[19] Therefore, a qualitative design was chosen for this study to best reflect the research goals of studying embodiment and life experiences through a sociology-influenced lens.

SECONDARY DATA ANALYSIS

To start, this study employed secondary data analysis of interview transcripts collected from 'HLTH 352: Sociology of Aging' students at the University of Waterloo. Permission was granted from the Office of Research Ethics to work on Dr. Elena Neiterman's existing study (ORE #: 41501).

SAMPLE

Next, transcripts were read and analyzed to find emerging narratives from a collection of the interviews. The final sample of 25 was selected based on the criteria that clear and direct answers were provided to conduct analysis with clarity and authenticity. The transcript selection process had no inclusion or exclusion criteria based on age, sex, demographics, or experiences. Moreover, the sample represented participants from a broad age range: 55-95 years old, 17 identifying as female, eight males, and 13 as immigrants to Canada with varying cultural backgrounds.

NARRATIVE ANALYSIS

Following the sample selection, the texts were analyzed using a qualitative data analysis software, NVivo. This process was largely influenced by techniques of narrative analysis as it encourages viewing texts holistically.[19] At length, the narrative analysis work began with listing themes or prominent narratives that emerged, consisting of: Age and Gender Perceptions, Education, Embodiment, Family and Friends, Generational Differences, Immigration, Leisure, Lessons, and Work-Life. Each transcript was coded with nodes named after each theme, for important information or details that contributed to constructing a narrative and expressing aging embodiment.

Further, each highlighted quote was analyzed in a list to identify the variation across transcripts for every theme and narrative. Doing so showed how a similar experience, like immigration, could differ in its construction and expression between participants. In conclusion, amongst the unique transcripts, three predominant time frames were the focus. The distinctions were made clear through repeat mentions of similar phenomena or milestones set either in the past, present, or future.

ETHICAL CONSIDERATIONS

Prior to transcript receipt, most names and identifying information were already removed, but any references in the "Results" and "Discussion" sections to participants were generalized and did not mention geographical locations or identifiers such as places of work or frequency. Additionally, the author's role as a student researcher was to ensure equity in academic research. Selecting a narrative analysis technique assisted in focusing on each transcript in a singular sense and not generalizing older adults into a collective. In summary, ethical considerations consisted of a conscious effort to keep data anonymous and to fully credit the diverse narratives by exploring them as individual experiences.

RESULTS
GENERAL

The findings represent the 17 female- and eight male-identifying participants, who are 55-95 years old and of varying nationalities, with 13 being immigrants to Canada. As participants shared life course experiences, conversations focused on monumental events, expressing aging embodiment, and potential lessons. Narratives included: Age and Gender Perceptions, Education, Embodiment, Family and Friends, Generational Differences, Immigration, Leisure, Lessons, and Work-Life.

PAST

Narratives that emphasized the role of the past were integral to identity development and were regarded fondly and with limited regret. A dominant narrative of the past focused on the immigrant experience from those who moved to Canada. Content primarily had to do with the roles of education, career choices, and family dynamics that were impacted by immigration. An 85-year-old immigrant who fled Ukraine at age 14, post-WW2, explained the challenges of adjusting to a country with increased stability compared to the participant's prior residence, in the following way:

Yes, yes, there was a definite period of adjustment when we first came over, and I've . . . and it was solely due to our experiences. These people here seemed . . . carefree, almost worry-free, they didn't- didn't . . . stew about little things. We were always, always . . . as if, we were more serious, we could not understand the frivolous things that some people, some kids our age would do, and . . . so- so we, well we simply wouldn't do that, no. We seemed more mature; I think.

The participant reflected on the continuous influence of past events, through noting the memorable differences between non-immigrants and immigrants in attitude and expressions.

Like immigrant narratives, some participants focused on specific ages or stages in the life course that were significant. Referencing an exact number, or a time in older adulthood, a participant stated that their actual age is known, but they currently feel much younger. Explaining their age as if they are still in a different era of their life. A 60-year-old participant who lives with their husband and two children explained:

Actually, I . . . still feel I can function normally because you know aging is just a number, seriously, you know? You don't feel like you age like every day you wake up with the same thing and nobody feels the aging. You know, I never feel I am 60 now. I still feel that I am at the university.

Participants, like so, acknowledged and appreciated the body, without overemphasizing the role of aging. Through references to the past, their actual age and the state of the participants bodies were explained as

something unnoticeable. Interviews that highlighted youthfulness in older adulthood, had participants that tended to compare the current state of the body to one of the past. The past state was often one that has remained important and influential to their later life. As well, milestones such as attending higher education or transitional points in careers in the past were frequent areas of focus.

Furthermore, past-focused participants were able to explain that individual situations are not universal aging experience and that there are differences amongst cohorts. These differences were commonly referenced in the coding of Generational Differences and Age and Gender Perceptions. To this end, a participant focused primarily on how aging experiences, collectively, are ameliorated because of medical advancements and more gerontological studies. The participant is a 62-year-old widowed male, retired, living in a retirement home, and vocalized that there have been major improvements:

I think [aging experiences are] definitely easier because medical science has made it easier; the drugs are better to help the aches and pains and just the fact that [aging] is understood (..) again, there are a lot of people (..) the size of the aging population is so large that we have all learned a lot. [It] may be because of [studies] like this that are studying these kinds of things and can tell people that this is what the average person is going through and I think the understanding of aging is a lot better these days.

The participant observed similar experiences within older adult cohorts and addressed how these have changed.

The marriage narrative was another key milestone of the past with long-term impacts. A few participants mentioned how aging with a partner can influence health status in older age. They shared that: "I age very healthy because [of] your partner you know. If your partner is good, you age really good. But like if your partner is bad, you age really fast. If you have a bad partner, aging will be so quick." This participant expressed that marriage created a positive age trajectory for them through the support of a partner.

Within these dominant narratives, other major life transitions had a noticeable influence on the construction and presentation of the past body. Key events included starting a family and raising children, beginnings and advancements in careers, and historical and cultural events such as war.

PRESENT

The second narrative category focused on the present state in the participants interviews. Conversations demonstrated the construction of present-based narratives primarily through focusing on leisure, daily life, and recent physical changes to the body. Many participants spoke about involvement in volunteer work, hobbies developed in retirement, and managing aging selves.

Firstly, as an emerging focus in the interviews, Embodiment was dominantly coded and communicated through expressions that aging is a natural process and not a progression to dwell on. Participants spoke directly about how aging is not a special development, so the focus of getting older should be on the growth of the person and the soul. Embodiment experiences were vocalized like so:

The differences include how aging is viewed in our societies (..) when I was younger in Iran, older people were very respected (..) because it is expected in Iranian culture. Getting older was never seen as something amazing, but as a natural part of our lives (...) the soul is what is most important (..) and we must try to be as good as we can be to have a good soul.

Participants, like the 82-year-old immigrant who lives alone, vocalized an understanding that aging is inevitable. Most participants, however, were experiencing minimal first-hand deficits such as physical, cognitive, or social changes.

Similarly, a widowed 78-year-old participant, who worked as a nurse shared that; "For me it was a natural progression. You know, you become an adult, you work, you retire, you get old." Their experience mirrored other participants' who were also not bothered by their aging bodies, explaining that these changes are the next step in an inevitable cycle.

While the consensus of aging expressions was mostly positive, as mentioned, there were a select few that highlighted personal downfalls with getting older. These aging critiques included the inability to perform quintessential tasks unattended and without difficulty. A participant is 95 years old, situated in long term care, and living with Multiple Sclerosis. They addressed how the physical body affects their functional abilities. The participant shared; "But I have . . . MS (..) very (...) It's called slowly progressive so (..) it affects my (...) mobility (...) And old age affects everything else." For this older adult, a decrease in abilities such as mobility and independence influenced perceptions and their mindset towards aging.

The mentions of physical, cognitive, and social decline mostly appeared as references to aging friends and family. A female participant, who is active on councils in their senior's complex, demonstrates how utilizing aging figures as a comparison point can influence self-understandings and expressions of age. The older adult referenced other aging individuals in the same building when expressing their youthful mindset. To explain how their body's challenges do not make them feel old, they shared that: "Personally, I'm in better health than a lot of them. I don't feel old. I do not feel old. I know I look old, I have aches and pains and problems walking, but I don't feel old. I want to keep living and keep doing the things I'm doing and helping people." Like the narrative that compared other aging figures, this participant uses other older adults' aging progression to model their conceptions of age. Other past-based participants were able to describe events such as health issues that have impacted the physical body. These conversations included comparisons of current states to other older adults, explaining that personal declines in abilities have not impacted them as severely as their peers.

Furthermore, the influence of the present body on the construction of aging narratives is shown through a participant who has seen a decrease in physical capabilities. This participant is 79 years old and experiencing vision loss. The older adult shared that: "It's the feeling of being made to depend on others. I

can't do simple things like dial the phone or going out for a walk on my own or drive. That's the hardest part. Losing the independence." These sentiments towards aging embodiment were largely influenced by an independent lifestyle as a hardworking businessperson and the changes that have occurred since retirement. Another participant explains the steps taken in aging and refers to their upbringing as occurring during the "Dark Ages" as a comedic way to define the age difference. The participant shared how they have embodied aging as something to be dealt with not dwelled upon and shared the following advice:

Just keep a positive attitude. When the aches and pains come, deal with them, if they can be looked after, take care of them. Take care of yourself, stay healthy, stay involved, become interested in what's going on in the world and maybe even get involved in politics, oh that's not a good one, but get interested in volunteering.

Each aging experience was marked by different circumstances in personal narratives that resulted in a stance or mentality of aging that represented who the participants are now and how the body has experienced the progression of getting older.

Further, participants talked about the values they hold, using present experiences to answer questions about guidance and what is important in life for aging. This narrative commonly emerged as a leisure-based theme, where older adults used present bodies and increased time to do meaningful tasks. A 73-year-old participant grew up in a family dedicated to learning about cultures. The older adult developed a passion for travelling and shared about the importance of fun, regardless of age:

Having fun. That's I think really important in every lifespan. In every lifespan. Having fun, the-or enjoying life . . . either for yourself, depending, you know what

your personality is, or with friends or family. But having fun is so, so important. It will, you know, renew your life and your outlook and everything, and . . . from there, you gain new energy to do other good thing

`A 79-year-old East Asian immigrant shared about the value in learning as there are more options for education and professions now. This narrative represents the learner; older adults who value education for themselves and younger generations. The participant expressed that; "I like to improve knowledge of the world every day. I like to be conversing about what is happening in the world and just listening to the commentaries, listening to radio and (..) tv and keep up to date with the world." This older adult values knowledge and is passionate about growing understandings of worldly events. The participant expressed that age will not stop any interest they have in learning. Notably, many older adult retirees are using increased personal time to find information-sharing leisure activities to continue growing and learning with age.

Next, participants separated changes to aging bodies from changes to mental states and attitudes. Some older adults spoke about the necessity to care for the body as it ages but to not let this need dominate emotions. Involvement in volunteering and community activities were prominent suggestions for younger adults as they grow, to encourage social and cultural awareness. A 65-year-old participant who is currently working as a nurse explained their philosophy of acceptance:

I think just accept every aspect of what happens, like every, you're going to get older I wouldn't worry about it. I would just make sure that you know, you would, you were aging as well as you could and just keep being
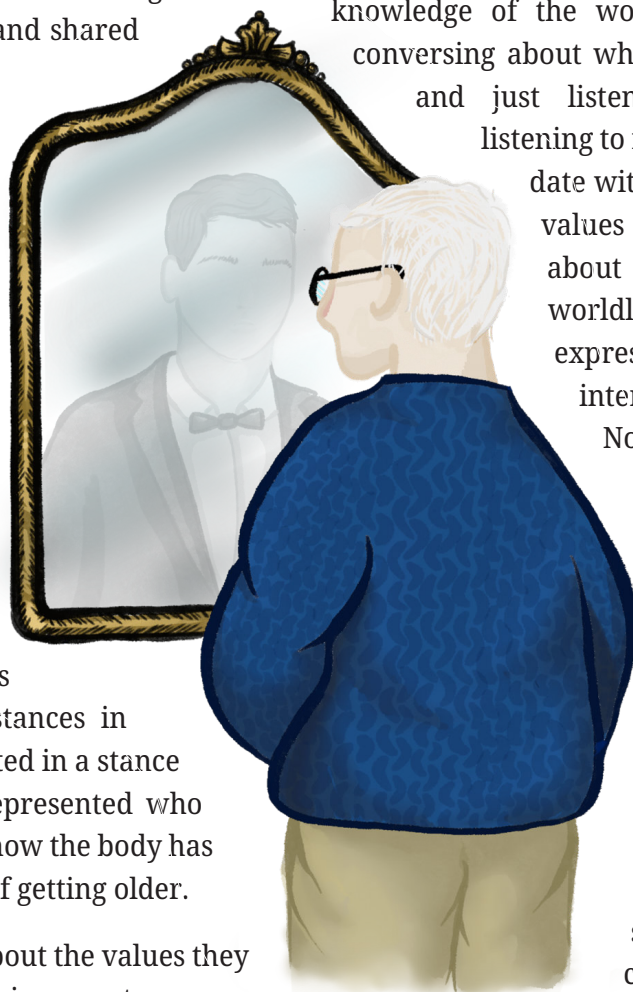
well-rounded like keep having interest. Keep doing the things you love and just be open for all the new experiences.

In expressing aging embodiment, many participants had a similar mentality of aging with the body, not against it. By accepting the changes that may come with age, some participants were able to continue living and growing without making aging a full-time focus, even when feeling the impacts of aging.

Some of the narratives that were present-focused were the Retirement, Work-Life, Education, and Leisure codes. Many older adults' embodiment experiences influenced expressions in older adulthood and the lessons they deemed important during interviews.

FUTURE

Results depicted conversations about Lessons or advice, Embodiment, and how bodies will evolve in the future. A few participants also expressed Generational Differences between student interviewers and themselves to solidify how future change is possible when considering the progress made historically.

A narrative that was future-based focused a lot on the importance of Education as a tool to later life success. While education and learning were also relevant in present narratives, when expressed from a future stance, the narrative was constructed more as a lesson or recommendation for younger generations to pursue. A 73-year-old, retired teacher and graduate studies counselor illustrates the common recurrence of how important education is in the life course. Many participants shared the repeated lesson of being dedicated to student life:

WELL, what I would definitely . . . say, get an excellent education. Often (..) a goal in the North American conte- context. People made it big without (..) the highest education, but I'm still of an old-fashioned . . . maybe attitude that education- good education will always be a good base for your career. AND THEN network, network, network.

Education was highlighted as a useful way to help

certain career paths and is important for identity development. A few older adults provided advice to pursue higher education or continue to learn in daily life in creative ways.

Following that future narrative, a 75-year-old was forced out of retirement by the 2008 market crash and had returned to work and volunteering at the time of the interview. The Work-Life narrative was prominent in those who were passionate about the career they had, if they were not retired, or like this participant, required to return to work to support themselves financially. The working older adult shared that: "Looking as a young person ahead, you have to be aware that the career choice that you are going to making are going to be more complex, and many MORE then when I was your age. Life was more simpler, in terms of choices available to you."

For them, by not considering the possibility of having to come out of retirement, the return to the workforce came as a shock. Therefore, the future guidance is to think ahead, especially as it relates to careers. Some participants advised the interviewers to be cognizant and always aware of what could be next. The lessons to the student interviewers were primarily to be ready and to plan because of the constant and unpredictable changes in work and life in general.

The Work-Life narrative emerged again with a participant who is 55 years old and still working to manage continuous and increasing expenses. They are hopeful that retirement is in the near future and shared this advice:

I think that you always need to think about the future. (..) there are so many issues in the world right now, and even a small mistake can change your life (..) when making decisions you should always consult older people as they have experienced this already and will give you good advice.

Participants, like this worker, used explanations of the past and present to guide conversations about what needs to happen in the coming years, through anecdotes. As a 55-year-old, this narrative and perspective of working into older adulthood may differ drastically from a retired older participants'

stance and past experiences in the workforce. Each narrative, regardless of age, contains valuable wisdom and guidance about how aging can evolve and what steps younger generations can take to ameliorate aging experiences.

While three distinct narratives emerged based on similar coding of node collections, there is also, notably, narrative cross-over. Each mindset: past, present, and future often collided when explaining embodiment experiences. Participants referenced events or sentiments of the past, the impact now, and what will happen in the future as the body continues to age. The construction of narratives showed the interwovenness of life course narratives and expressions of aging embodiment.

DISCUSSION
GENERAL

Overall, the findings focused on aging experiences through the construction of events that have occurred to the body and mind. These memories impacted expressions and sentiments towards older adulthood. The semi-structured nature of the interviews and small sample size allowed for personal questions and focused on each participant's story, as a unique piece in illuminating older adult lives. Therefore, most participants spoke directly about individualistic emotions or sentiments towards aging and did not rely on generalizations about age cohorts or aging stereotypes to amplify experiences. Each transcript represented an individualistic experience of aging and illustrated the significance of childhood, adulthood, and older adult embodiment on expressions of age. There was, however, a lot of crossover and continuity in the narratives as participants reflected upon similar milestones.

PAST

In past-based results, prominent narratives included being a student, worker, marriage partner, and immigrant. Many of these narratives appeared paired or combined with another narrative, if they somehow affected each other or co-existed such as immigration and work life. Participants who immigrated were often also very family-focused and dove into the narratives of being a parent or spouse and the role that played into the immigration experience. The construction of some immigrant narratives was rooted in early life experiences of turmoil and change before immigrating to Canada. In growing up with restrictions and limited luxuries, moving to a more liberated and leisure-encouraging country was not only a change in the physical environment but a lifestyle adjustment as well. Narratives that emphasized childhood or young adult struggle, demonstrated how immigration can impact the self and choices through increased freedoms. Immigrant experiences were seen to be a continuous narrative as their impacts were present in various life transitions. Further, participants who had an embodiment experience of youthfulness tended to have a more positive mental stance on the overall aging experience. This unique embodiment experience demonstrates that age is subjective to the body and mind of the individual who is either aware of the changes or chooses not to be defined by them. Additionally, the statement of how aging progresses based on relationships reinforces how past choices can have ongoing influence and meaning.

As a collective, past narratives provide insight into how major life changes in tandem with bodily changes hold personal value as older adults reflected on these events. Past-based narratives demonstrate Continuity Theory as participants reviewed life stories and drew connections on how their identity and body have been shaped due to specific experiences such as moving and the lifestyle changes that followed suit. The narratives of the past: immigration, youthfulness, and marriage, represent how embodiment is influenced by previous experiences that shape internalizations and expressions of age.

PRESENT

In present-based narratives, most older adults vocalized the aging journey positively by stating that aging is unavoidable and should be embraced for satisfaction in later years, especially as it is uncontrollable. Present selves were marked by aging

bodies at the time of interviews and many participants spoke about current selves optimistically, focusing on what they are doing, not on what they cannot do now or may not be able to do in he future. With retirees, there was more time for families, volunteer work, and finding hobbies of interest. These interests demonstrate the contributions older adults make to society post-work life. Narratives like this demonstrate the interconnectedness of embodiment of aging and how dynamic narratives provide varying levels of meaning and impact that are then expressed differently. These narratives align with the principles of Socioemotional Selectivity Theory through displays of positive reflection of the past and an ability to see how prior experiences shaped the present by having concrete discussions on emotion.

The narrative of acceptance contrasted to past-based interviews where some older adults expressed feeling young. These youthful thinkers utilized moments or phenomena to put their aging selves in a younger position. For the participants who were seemingly untouched by the impact of the present aging bodies, embodiment expressions were more focused on the continuity of life and being present, active beings. However, when negative aging experiences were presented, they mostly were perceptions developed from spouses and having to transition into the caregiver role or seeing friends and family struggle with age, not personal bodily experiences. If referencing other older adults' experiences with physical ability changes, alterations to activities of daily life were vocalized as a major adjustment and made the participants, who were reflecting, grateful for the state of present aging selves. Notably, it is the physical body itself that acts as the influence into aging perceptions, guiding them to feel and consequently believe they are old. Physical declines because of emerging chronic illnesses, demonstrate an increase in negative feelings about older adults' bodies.[6]

The present results showed some ageist stereotypes that match traditional definitions of aging as being marked by the body's decline and loss of abilities.[1] Stereotypes like so see aging as the driver for negative

presences in the participants lives and the body as the vessel displaying these negative impacts on the self. Some participants relied on using those in immediate social environments as a tool for comparison that reinstates personal beliefs of not feeling as old. These behaviours demonstrate how embodiment influences the individual categorization of aging bodies by using present experiences and stimuli to define aging selves. Many participants shared positive mementos and outlooks with advice that was likely influenced by present ambitions and the interests introduced in childhood that have led them to an enjoyable life. In other transcripts, the lessons expressed were also influenced by cultural awareness and family dynamics.

FUTURE

Lastly, in future narratives, it was found that many older adults were willing to provide ample advice or guidance to younger generations and directly to the student interviewers, some of which they knew personally. The lessons or advice shared were often based on broad-level societal goals such as career advancement and overall happiness and wellbeing. The consensus was that younger adults should focus on education, establishing a career, and planning to make sure that choices reflect what they want in life and to support aging bodies and minds. The findings contribute to the existing body of evidence[2,7,9] on aging embodiment while expanding older adult involvement in research through the opportunity to share life stories and lessons. Participants willingly shared advice or lessons with interviewers, hopeful for action or change that would benefit older adults beyond the interviews.

The lessons shared in the interviews were evidently expressions of what had occurred in the participants lives, what they had wished to achieve for themselves, and what they hope can happen for future generations. Future narratives were successful at responding to one of the supporting research questions; "What life lessons are beneficial for younger generations to know for their own aging experiences?" as shown through recommendations to the student interviewers. Most participants were not

regretful of the path's taken and instead were reflecting on how decisions impacted certain trajectories in current lives to respond to interview questions.

In comparison to other qualitative studies that focus on older adult narratives[11,20] this study has a broader scope and did not feature a specific cohort of older adults with commonalities such as exercise interests.[20] For reference, Phoenix & Smith's[20] study on bodybuilding older adults also uses a narrative analysis approach and collects life-story interviews. However, the results on this cohort of active older adults demonstrated a singular common narrative of aging resistance, with the only notable differences being the degree of resistance, because of the specificity of the group and interests.[20] Many studies focus primarily on specific older adults' identities like gendered embodiment experiences[21] or how different social circumstances converge with biological conditions to impact aging experiences.[4] Therefore, the findings of this study, while wide-ranging, provide a more realistic glimpse into older adult lives and allow for individuality to thrive in the results over cohort commonality.

Furthermore, a narrative analysis approach considers the role of other age demographics in the aging experience by providing insight into the life lessons taught to the younger adult researchers about care, respect, and interactions with older adults. This intergenerational storytelling aspect has supported the research goals and questions to create a more comprehensive understanding of the embodiment experiences and lessons about aging that can be applied by younger adults, academics, and healthcare professionals.

As a note, not every interviewer and participant duo held a familial connection, therefore the study assists at creating intergenerational bonds and lessons for young adults in general. Conversing in a semi-structured interview facet provided opportunities to learn empathy about different aging experiences and abilities and for young adults to become more aware of the actions that may contribute to ageism and stereotyping. While embodiment and connections to

aging are not novel topics, the added elements of generational storytelling and life lessons create a new and meaningful study that considers the participants' identity divergence.

LIMITATIONS

Regarding the research, the most prevalent limitation to the project was completing secondary research analysis. By utilizing transcripts completed in the past, and for a different project and course, certain elements could not be controlled within the participant selection process and throughout the interviews. This limitation was minimized through the strategic selection of a small sample that were of similar substance and provided diverse content through unique life experiences. By increasing the interviews read, a thoughtful and varied sample size of 25 was selected, resulting in a more comprehensive analysis.

FUTURE RESEARCH

Moving forward, future research with older adults should focus on how experiences involving the body impact decision-making and experiences in aging lives. This element would be important to consider to further understand the roles that age perceptions and body changes have on the life course. Increased analysis of life experiences and the use of inclusive methodologies such as face-to-face interviews and narrative analysis will be integral for continuing older adult research ethically and respectably.

CONCLUSIONS

In summary, the study provides further evidence into the continuum of the aging experience, through a sample of 25 semi-structured interview transcripts with no participant selection criteria. Analysis of the texts showed the emergence of three categories: past, present, and future with narratives of immigration, marriage, parenting, education, work-life, and retirement. The study demonstrates the importance of illuminating older adult lives to understand embodiment realities and to best support aging populations. Older adults continue to generously share wisdom and advice, especially with younger adults who are likely to be the future changemakers.

The thesis' findings act as evidence as to what can be learned from actively listening to older adults and can encourage health policy reform. Without continued interest in aging studies, older adult populations will not receive the care and consideration deserved to all humans throughout the life course. Hopefully, these findings inform aging environments to use social gerontology methods in future research.

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GENETIC ENGINEERING:
UNWANTED CONSEQUENCES

Mahmoud El Mabrouk, BSc[1]; Zahra Mohamed, BSc[2]

[1]Department of Physics and Astronomy, University of Waterloo, melmabro@uwaterloo.ca; [2]Faculty of Health, University of Waterloo,

ABSTRACT

Within the last 50 years, the idea of genetic engineering to modify the human genome has surfaced, becoming an extremely revolutionary yet highly controversial topic. With rapid advances in genetic research, the machinery used to perform such gene-editing procedures has already been developed; genetically mutating humans is now possible. The question is no longer "Can we" but now, "Should we". The ethical concerns surrounding this issue have been thoroughly discussed in the science community, causing widespread debate on whether research should be allowed in this field of study. Many scientists believe that research in this field should be encouraged to further study genetic diseases, different means of reproduction, and other life-altering concepts such as physiological and psychological enhancement. On the other hand, many believe such research should be completely prohibited as these practices can potentially become extremely problematic due to the predicted and unknown implications that could be faced as a result of genetic engineering. Never before have we had such power and control over our own biological makeup. Considering that human lives are at risk under these practices, germline genetic engineering should be universally prohibited as it is unethical, unsafe, and medically unnecessary.

INTRODUCTION

Genetic engineering is the process of modifying the makeup of a living organism by manipulating its genetic material.[1] First manifested in 1973 by Stanley N. Cohen and Herbert W. Boyer through viable genetically modified *Escherichia coli* bacteria,[2] scientific advancements allowed for the use of gene-editing technology such as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) to detect, modify or delete certain genes,[3] thus leading to many applications such as the production of insulin and human growth hormones.[2] However, medical research granted scientific fiction an entryway to reality; multicellular organisms of complexities parallel to typical plants and animals were genetically engineered to favour the survival of the human race.[4] The scope of this biotechnological miracle went even further; the first cloned animal, Dolly the Sheep, was born July 5, 1996.[5] Appropriately, genetically modified

organisms acquired proponents and opponents who still vigorously debate this controversial topic.[6] Yet, another natural question with serious implications arises: What about humans? Human genetic engineering has already made huge strides in showing promising treatments for diseases such as cancer, cystic fibrosis, and heart diseases.[7] By eliminating unwanted traits and/or producing beneficial ones, many aim to use germline editing to terminate the inheritance of genetic disorders. However, should non-medical genetic engineering be employed, perhaps to design an ideal baby? That would be an unwise traverse to a slippery slope of discrimination, warfare, and ethical issues.

EUGENICS

Eugenics is the advocacy of selective human breeding to strengthen "desirable" traits by

EUGENICS

Eugenics is the advocacy of selective human breeding to strengthen "desirable" traits by encouraging selective mating, thereby producing a "superior" human race.[8] This is not a new concept – the U.S. was the first to systematically sterilize inferior-deemed individuals in the early 1900s.[8] Furthermore, the Nazi government in 1933 forcefully sterilized at least 400,000 Germans against their will under the "Law for the Prevention of Progeny with Hereditary Diseases."[9] Adolf Hitler adopted these same eugenics ideas and established a program of euthanasia for adults and children, where his unethical ideas eventually led to the extermination of millions of Jews.[9] Using genetic engineering unnecessarily to please one's desires of an "ideal" child is comparable to eugenics; as a matter of fact, it is a strong promoter of eugenics due to its unparalleled efficacy relative to traditional selective breeding.[10] Hitler's ideas could be repeated, this time with the more efficient genetic engineering to carry out the diabolical ideas. The concept of "superiority" would become more prevalent, aided by the support of genetic engineering. This would perpetuate discrimination and a world where some traits, seen as inferior to others, are in need of elimination. This obviously creates great concern. The potential to create a societal hierarchy based on social subjectivity and racial bias is verily possible – to advocate equality and exercise non-medical genetic engineering is paradoxical.

NOVEL AGENT OF WAR

Human civilization took part in war heavily; the first war recorded took place sometime in 2700 BCE, millenia before the 20th century world wars,[11] and wars are still ongoing.[12] However, the form of combat evolved rapidly with the advancement of science and technology. Infantry warfare is the oldest form of conflict known, yet military technology saw an introduction of chemical/biological warfare in World War I.[13]

Yet, human genetic engineering could produce a form of warfare only realized in fictional stories – preparing stronger and faster soldiers before their birth. These soldiers would also have their freedom stripped away from them by being tasked with a specific goal from birth. Their will would be molded carefully. Some of the consequences already started to appear; genetic engineering is already exploited by biomedical researchers for military use.[14] The question now is whether a military system, comprised of birthed soldiers with the sole purpose of militant behaviour, will truly come into existence.

SAFETY CONCERNS

The Centre for Genetics and Society has stated their support for somatic gene editing research to medically treat living humans, but strongly suggest implementing laws against germline modifications on human embryos due to the adverse implications that could occur.[15] Experimenting with sex cells poses the risk of pregnancy complications such as miscarriages, stillbirths, and maternal injuries.[15] Professionals in the field of genetic research are wary of two kinds of gene editing complications known as off-target repeats, which is when edits are made in the wrong location of the genome, and mosaicism, in which errors in cell division cause some cells to inherit the edit but not others.[16] Even if the genetically modified individual is born seemingly healthy; it is possible that they can develop issues later in life.[15] While this may be a problem for the modified child, all of their offspring and future generations will be at risk too as these modifications are permanent, heritable, and irreversible.[17] Not only must we consider the possible consequences that genome modification could have on individual health, but we must consider its potential effects on the environment as well. Genetic engineering can manipulate a human's genome to such an extent that it can make humans incompatible with their environments.[1] This can cause ecological issues, with its effects being similar to that of what a non-native species would do in a foreign habitat,

disrupting the natural order within the ecosystem.[1] For example, an error in the modified genes could result in a species that is unsuitable for its respective climate or an unwanted resistance to antibiotics, which could be lethal.[18] Legally permitting gene editing practices is not worthwhile due to the potential consequences on human and environmental health.

SOCIAL ISSUES

The ability to select traits and edit genes through genetic engineering contributes to the outrageous idea that humans are genetically perfectible species. If germline editing were to be legally practiced, the temptation to use these technologies for superfluous and non-medical reasons would be highly prevalent. Using gene editing for enhancement purposes may create a separate species of genetically modified humans who are seen as superior, allowing them to thrive in physical and social contexts, inevitably creating a great divide in society. Giving society the option to edit their children's genes will foster unhealthy competition and will create a world where parents may feel morally obligated to give their children a "head start," striving to give them a competitive edge over others. The psychological effect of genetic editing on childhood development must be considered; children who receive certain traits may feel pressured to live according to those traits. For instance, a child with genetically enhanced athleticism might feel forced into pursuing a career in sport due to their modifications, despite their own wishes. This can cause turmoil within the mind of the developing child, altering their sense of identity and self-esteem. While it is acceptable to offer your child opportunities such as sports training, it is immoral to coerce them into a predetermined genetic mold.
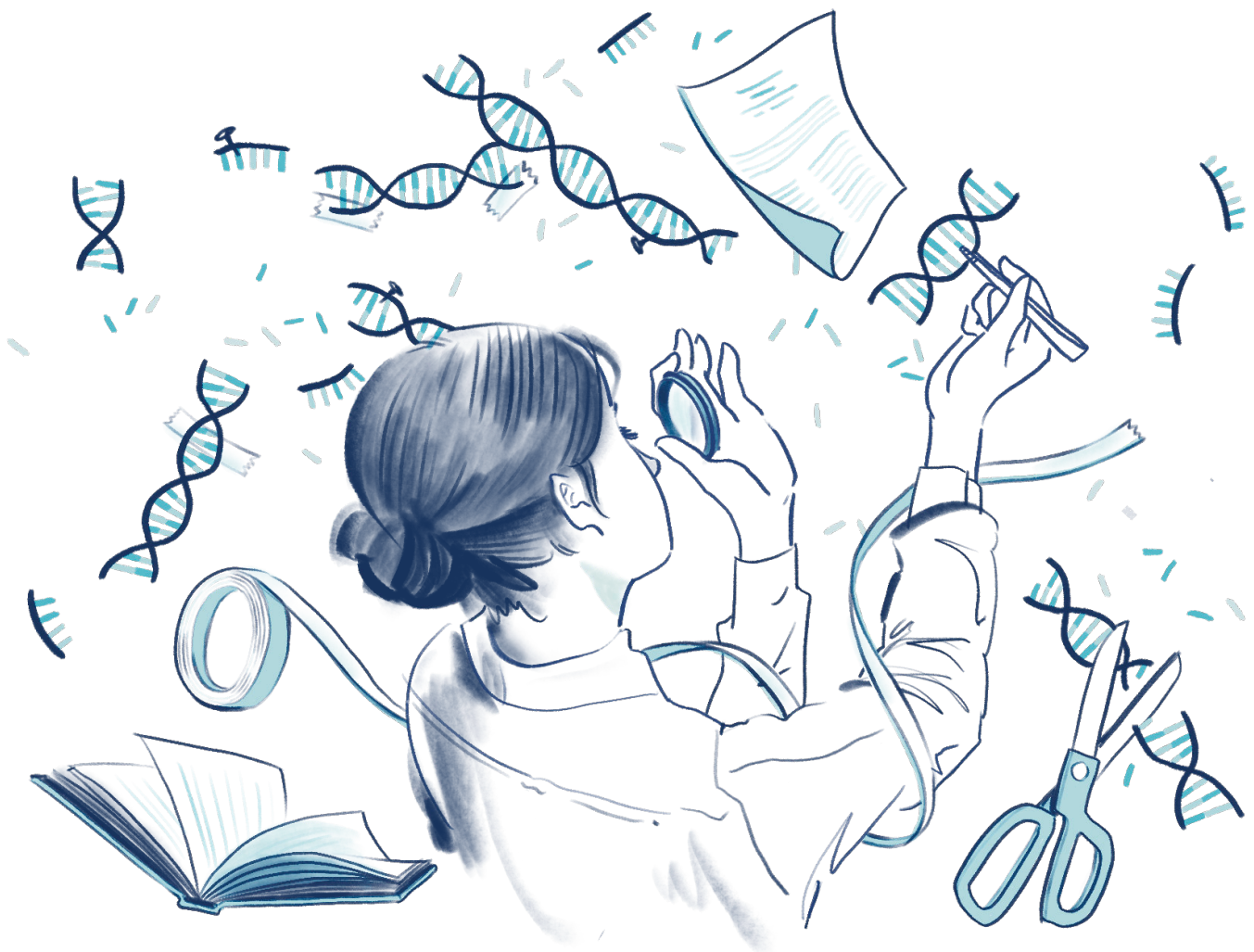
CONSENT

One major ethical consideration for genetic modification is the issue of consent. In this process, the parents of the embryo are the only consenting party, as the embryo,who will soon develop into a living baby, has no say in the procedure and did not allow for their genes to be edited. In the Journal of Medical Ethics, philosopher Matthew Liao discusses the implications of genetic engineering, mentioning how every person should have the right to govern their own life.[18] Autonomy, the freedom allowing those to live their lives on their own terms, is a basic human right that should be available to all, and to alter a human's life through gene editing without their consent is a complete violation of that right. The problem of permission arises again when the genetically modified human has children; all the offspring that inherit the modifications will have gene edits that they did not consent to.

NECESSITY

While many support the idea of genetic engineering to improve the human race by weeding out undesirable traits, the existing process of natural selection offers a more ethical method of doing so. In natural selection, characteristics of a species are passed on due to their competence in promoting survival and reproduction, whereas in genetic engineering, due to the lack of clarity separating the difference between medical and enhancement uses, traits are selected in less of a moral manner.[19] Existing methods, such as preimplantation genetic diagnosis (PGD), offer the same benefits as genome editing but with much less risk.[16] PGD is used for the genetic screening of multiple embryos to identify the most favourable one for birth, as opposed to deliberately modifying genes via genetic engineering.[16] This process then uses in vitro fertilization to implant the selected egg into the uterus.[16] This screening process promotes the monitoring of genetic disorders and enables parents who fear passing on defective genes to give their future child the best chance of survival at a more cost- efficient and ethical price.[16]

CONCLUSION

It is more difficult to negate the occurrence of an event than its confirmation. That is why completing an extensive and predictive study on the psychological, sociological, and economic reaction to artificial human design must be carried out before any public use of this biotechnology should even be considered. While it is evident that genetic engineering holds prodigious potential for the treatment of life-threatening diseases by directly editing the mutant genes, it can also cause detrimental damage to society. Genetic engineering should not be allowed as it is a risky, immoral, and medically unnecessary procedure.

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GAPS IN SEVERE MATERNAL MORBIDITY;
THE LACK OF PRECONCEPTION CARE BETWEEN NON-HISPANIC BLACK WOMEN AND NON-HISPANIC WHITE WOMEN: A U.S HEALTH CRISIS

Aida Zaheer, BSc[1]
[1]Health Sciences, a6zaheer@uwaterloo.ca

ABSTRACT

Improving preconception care in the United States will reduce the race-based health disparity that exists between Non-Hispanic Black women and Non-Hispanic White women regarding severe maternal morbidity (SMM). This opinion article describes the reasons why preconception care within the U.S. should be improved to reduce the rates of SMM among women. By promoting reproductive planning and contraceptive use along with the implementation of chronic disease management into clinical practice, efforts to prioritize preconception care will be successful. Prioritizing preconception care in these ways will aid in the successful transformation of health care delivery provided to Non-Hispanic Black women who are at a greater predisposed risk to develop SMM compared to their Non-Hispanic White counterparts. An additional factor presented considers how the lack of access to healthcare, which predominantly affects Non-Hispanic Black women, prevents this group of women from accessing preconception care to reduce rates of SMM. By implementing preconception care methods, some may argue that the disparity gap will ultimately widen due to the differential health-care access between Non-Hispanic Black women and Non-Hispanic White women. This argument is further considered and a possible solution to this problem is provided.

INTRODUCTION

More than 50,000 women in the United States experience adverse health outcomes as a result of severe pregnancy complications each year. Alarmingly, 2 out of 3 of these negative health outcomes are thought to be preventable.[1] These birth complications are referred to as severe maternal morbidity (SMM), a condition that disproportionately affects Non-Hispanic Black American women at a rate nearly three times higher than Non-Hispanic White women.[2] Specifically, SMM is defined as the unexpected labour and delivery outcomes that may result in adverse long-term and short-term consequences to a woman's health, such as acute myocardial infarction, cardiac arrest, and heart

failure.[3]

Preconception care is defined as the health of women and men during their reproductive years.[4] One of the goals of preconception care is to reduce the rates of SMM by taking preventative measures that improve the health of women before pregnancy.[4] Improving women's preconception health statuses will yield better reproductive health outcomes along with reductions in societal costs and decreased rates of SMM.[5] Preconception care implementation can be done via promotion of reproductive planning and contraceptive use. Furthermore, it can be addressed by the implementation of chronic disease management into clinical practice, to aid in reducing SMM cases that disproportionately affect Non-Hispanic Black women within the U.S.

PROMOTING REPRODUCTIVE PLANNING AND CONTRACEPTIVE USE

Reproductive planning can reduce SMM by ensuring individuals are well-informed about contraceptive methods, allowing them to exercise control over the timing and spacing of their pregnancies.[6] According to the United Health Foundation, 30.6% of pregnancies in the United States were unplanned in 2019.[7] Compared to Non-Hispanic White women, Non-Hispanic Black Women were more than two times more likely to experience an unintended pregnancy.[7] Unintended pregnancies are heavily tied to increased SMM. In particular, individuals with unintended pregnancies are less likely to use maternal health care services , which ultimately increases the risk for maternal health complications and poorer infant health outcomes.[8] Given the large portion of U.S. pregnancies that are unplanned, enhanced information delivery concerning reproductive planning and contraceptive use by healthcare providers will greatly help to foster a healthy pregnancy experience for women. Specifically, it will help Non-Hispanic Black women experiencing unplanned pregnancies within the U.S.

IMPLEMENTING CHRONIC DISEASE MANAGEMENT INTO CLINICAL PRACTICE TO REDUCE PRE-EXISTING COMORBIDITIES

Women with three or more comorbidities are identified as those having the highest rates of severe maternal morbidity.[9] This is indicative of a dose-response relationship, which is defined as the associated increase or decrease between two variables. The dose-response relationship in this case can be identified as an increase in the number of comorbidities results in a concomitant increase in the risk of developing SMM among pregnant women.[9] This relationship disproportionately affects Non-Hispanic Black women, given that they have higher rates of comorbidities than other racial and ethnic groups.[9] The general Black-White disparity in SMM can be partially attributed to the increased case fatality rate in Black women as a result of pre-existing conditions. According to a study analyzing temporal trends to identify racial disparities in comorbidity within the U.S., White women have undergone a temporal change in comorbidity and SMM at a rate of -9.7% between 1993 and 2012.[10] On the

other hand, Black women have undergone a rate change of +2.6%.[10] Alarmingly, such findings indicate that the health disparity concerning the prevalence of SMM, and related comorbidities have widened between Black and White women.

In consideration of the specific chronic diseases that require intervention, hypertension is identified as the leading cause of SMM.[11] Given this information, implementation of evidence-based chronic disease management interventions, which includes targeting hypertension in a clinical setting, could reduce SMM risk. More specifically, blood pressure checks should be implemented as a check-up procedure during routine care for women of reproductive age.[12] By doing so, hypertension can be diagnosed early on and as a result, these women can be prescribed the appropriate medical treatments and counselling services to manage lifestyle changes that are safe for women of reproductive age.[12]

LACK OF HEALTHCARE ACCESSIBILITY AS A BARRIER TO ACCESSING PRECONCEPTION CARE

Issues regarding healthcare accessibility make it difficult to access preventative measures by all individuals seeking preconception care, particularly affecting Non-Hispanic Black women. Women's health insurance coverage plays a large role in their access to preventative care. It is estimated that 12.8 million women within the U.S. remain without health insurance, thus limiting a large female group from accessing resources that allow for them to have agency over their reproductive health.[13] Furthermore, rates of Non-Hispanic Black women lacking health insurance have been much higher than their Non-Hispanic White counterparts within the U.S. as of 2010, indicating that they would be at a greater risk for lack of access to preconception care.[14] Given this fact, there are opportunities to narrow the disparities that exist among Non-Hispanic Black women and other ethnic groups by enrolling eligible individuals in marketplace coverage.[14]

The American Rescue Plan Act (ARPA) was enacted in 2021, which resulted in increased access to health coverage by temporarily increasing eligibility for subsidies to buy health insurance via health insurance marketplaces.[14] As a result, over 6 in 10 uninsured non-elderly individuals are now eligible for the financial assistance necessary to obtain health insurance coverage, thus creating an accessible pathway for women to gain access to the necessary preconception care resources that they need.[14] Since Non-Hispanic Black women are predominantly affected by lack of healthcare insurance within the U.S., this Act provides the necessary resources needed to help narrow the existing racial gap of health care access. [14]

CONCLUDING STATEMENT

Providing quality preconception care is a responsibility that all primary care providers must adopt. This form of care should include reproductive planning and contraceptive use as well as chronic disease management to treat pre-existing comorbidities. Ultimately, the implementation of preconception care will aid in taking the preventative measures necessary to reduce SMM among women in the U.S. By targeting the specific aspects of SMM that disproportionately affect Non-Hispanic Black women, the health disparities among these women in comparison to women of other ethnic or racial categories will begin closing. Not only will these measures benefit the health of Non-Hispanic Black women but will support efforts to improve overall maternal and fetal outcomes, ultimately reducing the rates of SMM in women throughout the U.S.

SENIOR EDITOR TAKUYA SHIBAYAMA
EDITORS PANUYA ATHITHAN
JALISA KARIM
ILLUSTRATOR RAVEN SIM

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TO GET OR NOT TO GET VACCINATED:
VACCINATION AGAINST COVID-19 AS THE BETTER OPTION

Precious Nwaka, BSc[1]

[1]4A Health Studies, School of Public Health Sciences, precious.nwaka@outlook.com

ABSTRACT

During the current COVID-19 pandemic, researchers have developed COVID-19 vaccines, conducted successful clinical trials, and administered the vaccines to the public. However, as many opinions circulate throughout communities on whether getting vaccinated is safe, individuals must decide if getting vaccinated is truly better and safer than not getting vaccinated. The author provides statistics and current data on vaccination to prove that getting vaccinated is the best option amongst the two.

In this article, the author lists common arguments against vaccination, acknowledges the validity and misinformation contained in these statements, and provides counterarguments for why vaccination remains the safest option to fight against COVID-19.
Overall, the purpose of this article is to challenge common ideas fostering vaccine hesitancy by providing an opposing point of view supported with credible information.

INTRODUCTION

With the rapid emergence of COVID-19 in 2019 and its global catastrophic consequences, researchers engaged in a race against time to develop, study, and distribute COVID-19 vaccines.[1] Despite the dire need for a quick solution against rising SARS-CoV-2 (the virus causing COVID-19) infection rates, these vaccines were not received with open arms by many.

By conducting sequential processes in parallel, clinical trials done by companies such as Johnson & Johnson, Pfizer/BioNTech, and Moderna passed through phases I and II rather quickly.[2-5] From these clinical trials, each company has concluded their vaccine to be effective and safe for administration to the general public.[2-5]

Various opinions have continued to circulate both inside and outside the health community on whether getting vaccinated against COVID-19 is as safe as clinical trials suggest.[6] One study that filtered through Twitter feeds found that only 57.65% of users supported the idea of COVID-19 vaccination, with 19.30% of users displaying vaccine hesitancy and the other 23.05% opposing vaccination altogether.[7] Another study adopting similar research methods found that COVID-19 vaccine opposition increased by 80% from four months before COVID-19 spread to the United States to four months after community transmission.[8]

To get or not to get vaccinated: that is the question. With sporadic infection rates transcending national borders, one must decide as quickly as possible whether to get vaccinated or not. After exploring and analyzing existing research and statistics concerning the topic of COVID-19 and vaccination, the author

asserts that getting vaccinated is the better option amongst the two.

BODY

Initially, those who oppose COVID-19 vaccination may question its safety by focusing the fact that it is associated with some negative health risks, which is valid to a certain extent. Following the administration of the AstraZeneca Vaxzervria/COVISHIELD COVID-19 vaccines in Canada, reports of thrombosis with thrombocytopenia syndrome and Guillain-Barre Syndrome have been made.[9] Additionally, reports of myocarditis and pericarditis have also been made after the administration of Moderna and Pfizer BioNTech mRNA vaccines.[9] However, as of October 18th, 2021, the Government of Canada reported 4,927 cases of serious adverse effects after COVID-19 dose administration, which is only 0.009% of the total doses administered at that time.[9] Thus, although one may experience adverse health effects after vaccination, the odds of such events are minuscule.

On the other hand, one investigation conducted in Los Angeles County found that unvaccinated individuals were 4.9 times more likely to test positive and 29.2 times more likely to get hospitalized with COVID-19 than fully vaccinated individuals.[10] Recent data published by the CDC suggested that the risk of dying from COVID-19 in the United States is 11.3 times greater in unvaccinated individuals compared to their vaccinated counterparts.[11] Consequently, it is evident that those who opt-out of vaccination are at a much greater risk of serious COVID-19 infection that those who do not.

Overall, although one might experience negative health effects after vaccination, refusal to get vaccinated puts one at greater risk of contracting, being hospitalized with, and dying from COVID-19. Thus, vaccination is the safer option.

Next, one supporting the decision not to get vaccinated may state that COVID-19 death rates are low—for example, as of November 12th, 2021, the COVID-19 case-fatality ratio in the United States was about 1.6%[12] — and most of these deaths are in individuals with comorbidities. Therefore, these individuals may conclude that it is not necessary for healthy individuals to get vaccinated.

Although it may be true that COVID-19 death rates are higher in vulnerable populations but normally lower in the general population, getting vaccinated protects communities and the vulnerable populations in them.[13] Having high proportions of vaccinated individuals relative to unvaccinated individuals in communities help establish herd immunity, where the virus is unlikely to spread in communities because most people are immune to it.[13] Although herd immunity has not quite yet been reached in most communities,[14] communities with high vaccination rates such as the Peel Region in Ontario, Canada have seen lower rates of COVID-19 infection.[15] Conversely, as a province with one of the lowest vaccination rates in Canada, Saskatchewan's COVID-19 death rate as of October 2021 was three times higher than the national death rate.[16]

Furthermore, some individuals with pre-existing health conditions are medically exempt from getting vaccinated against COVID-19 but are still susceptible to the virus and adverse health effects of infection.[17]
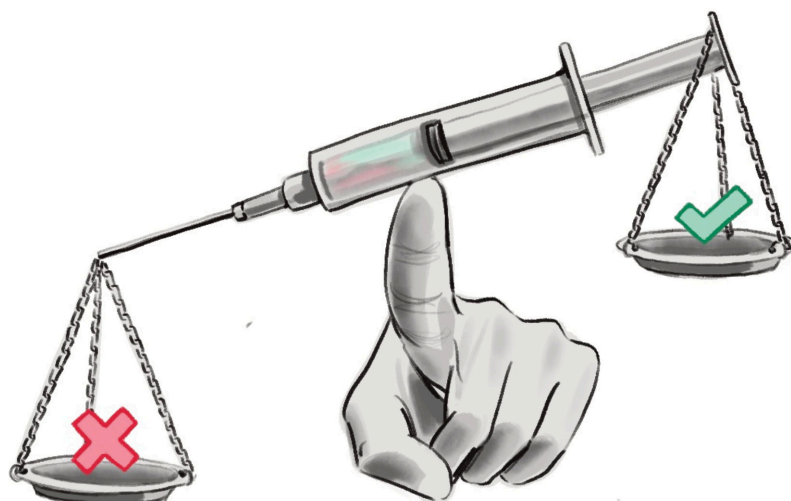
Getting vaccinated protects all individuals in the community, proving it to be the better option.

Lastly, those who oppose the administration of COVID-19 vaccines may say that COVID-19 rates are decreasing in

certain communities, so vaccination is not needed. Although it is true that infection rates are decreasing in some provinces like Ontario, Canada,[18] it is also true that getting vaccinated prevents future outbreaks.[13]

The New York City outbreak of measles from 2018-2019 is a good example to demonstrate why vaccination against COVID-19 is still essential, even with decreasing infection rates. In 2000, the United States declared that measles was eliminated, and with antivaccination on the rise, fewer Americans were getting vaccinated against measles.[19] With an imported case of measles in 2018, New York City experienced a measles outbreak.[19] One study in the New England Journal of Medicine found the outbreak to be a consequence of under-vaccination as patient records revealed that 85.8% of the infected patients were unvaccinated.[19]

In the case of COVID-19, as restrictions on international travel continue to loosen, it is possible that COVID-19 cases are imported. However, vaccination prevents outbreaks in such situations as when more people in the population are vaccinated, the infection is less likely to spread when introduced

Therefore, even though COVID-19 cases are dropping in some areas, getting vaccinated protects communities from future outbreaks, proving that getting vaccinated is the safer choice.

Overall, because of the short period of time between the first known case of COVID-19 in 2019 and now, there are a lot of existing research gaps. To fill in these gaps, ill-informed opinions and misinformation continue to spread across communities. Those opposing vaccination may focus on possible adverse effects, low rates of infection and death, and the downward trend of infection rates and claim that not getting vaccinated against COVID-19 is safer than getting vaccinated.

To get or not to get vaccinated: that is the question. Current data makes it apparent that although rare health effects may be followed by vaccination, getting vaccinated is the safer option as it protects individuals and communities from the even more

detrimental health effects of COVID-19.

Nevertheless, amid this tumult of opinions, this field would benefit from phase IV trials and other studies assessing the effects of vaccination in individuals and communities.

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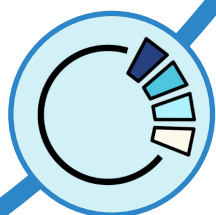
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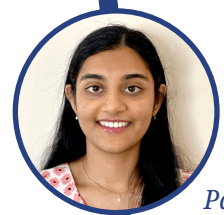
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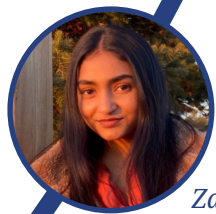
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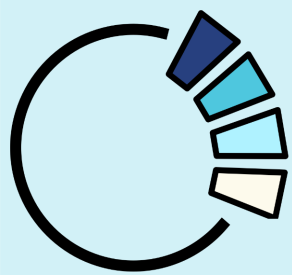
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