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What is the influence of identity processes and group norms on healthcare professionals in relation to recommending cannabis to patients?

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PhD in Psychology

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December, 2020

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Department of Social and Organizational Psychology

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Doctor Maria Luísa Lima, Full Professor, ISCTE - Instituto Universitário de Lisboa (Supervisor)

December, 2020

Acknowledgements

Arriving in Portugal in 2017, I decided that it was a good time to think about doing a PhD in order to learn how to undertake research in social psychology, to explore social psychology from my applied lens and to join a Portuguese institution. The journey through this research has certainly been significant, and there have been a number of very important people that have supported the endeavor.

Professor Maria Luisa Lima, my first supervisor, has provided ongoing input in the research process. I appreciate that during her summer break she assisted me in getting the research proposal completed so that I could apply to the LiSP social psychology program. Professor Jolanda Jetten, my second supervisor, provided timely and useful feedback for our work, and it is very much appreciated. Thanks also to Denis Sindic who offered some useful perspectives related to group identification and norms. Eduardo Reis and Marco Rego never complained about the number of questions I asked about administration or processes to do with the university. They have been standouts in assisting me in navigating organizational boundaries.

Michael Parkes has given unending emotional support and love, practical suggestions, and challenge when I became stuck in repetitious loops. He and my dog, Vivian, accompanied me on many walks where talking about the PhD challenges was a key theme. I am also incredibly grateful to Carmel O'Rourke and Mark Norris for their wisdom and practical support.

A big "good on ya mate" to Julia Fernando, my friend and PhD colleague. Some highlights have been introducing me to online writing retreats, navigating statistics by her explaining many details and co creating a space where we could process the many challenging dynamics associated with undertaking our research. Olivia Margo has always been a supporter and knowing listener about the internal process the research provoked. Thank you all, I loved our "whine sessions."

Resumo

Hoje em dia, os profissionais que trabalham nos sistemas de saúde são confrontados com muitas mudanças no seu trabalho, resultantes de preocupações com o ambiente, a alimentação e a saúde. A utilização médica de canabis foi uma destas alterações recentes. O objetivo central desta dissertação foi o de examinar como os processos de identidade e as normas de grupo influenciam os profissionais de saúde em relação à recomendação de canabis. A base teórica das nossas hipóteses foi a abordagem da identidade social em particular as influências sociais e o funcionamento das estruturas de identidade social dos profissionais de saúde. Uma revisão da literatura inicial investigou o atual panorama global do trilema saúde, alimentação e ambiente, e como a canabis se enquadra nestas áreas; salientámos que as intervenções comportamentais a nível de grupo são fundamentais para enfrentar os crescentes desafios ambientais e de saúde (Capítulo 2). Uma revisão sistemática sobre os comportamentos dos profissionais de saúde face à utilização médica da canabis, utilizando o Theoretical Domains Framework (Cane et al., 2012), ostrou que raramente eram consideradas as influências ambientais e sociais (Capítulo 3). Com base nestas conclusões, realizámos um estudo para examinar as influências sociais sobre a forma como os profissionais de saúde viam a urilização médica da canabis. Os resultados mostraram que quanto mais os participantes se identificavam com o seu grupo profissional, maior era a influência nas normas de grupo relacionadas com o uso médico da canabis e com o bem-estar (Capítulo 4). Utilizando um novo software online de mapeamento de grupos sociais, examinámos as identidades sociais subjetivas dos profissionais de saúde que tinham participado no nosso estudo anterior. Verificou-se que os supergrupos e o bem-estar estavam negativamente associados à aceitação da mudança (Capítulo 5). Os níveis percebidos de apoio do grupo influenciaram as normas de grupo em relação à canabis, enquanto a positividade e a sobreposição de membros afetaram as dimensões da mudança (Capítulo 6). De um modo geral, verificou-se que a identificação com grupos profissionais influenciou as normas de grupo relacionadas com a canabis e a aceitação de dimensões de mudança. No geral, a identificação com grupos profissionais e as medidas de identidade social grupal influenciaram a aceitação da mudança e as normas de grupo relacionadas com a recomendação de canábis aos pacientes. Estes resultados sugerem a importância do nível de análise grupal ao trabalhar em contextos de cuidados de saúde, a fim de garantir a implementação eficaz e centrada no paciente de mudanças em políticas, processos ou tratamentos.

Palavras-chave: identidades sociais, normas de grupo, mudança, canabis

Códigos PsycINFO:

3000 Psicologia Social
3020 Processos Grupais e Interpessoais
3360 Saúde Psicologia e medicina

Abstract

Today, professionals working in healthcare systems are confronted with many changes in their work, resulting from the escalating global environment, diet and health trilemma, technology and globalization. The central aim of this dissertation was to examine the influence of identity processes and group norms on healthcare professionals in relation to recommending cannabis to patients. The theoretical underpinning of our hypotheses was based on the social identity approach, in particular the social influences and functioning of the social identities of healthcare professionals. A literature review investigated the current global health, diet, and environment landscape, and where cannabis fits within these areas, and found that group-level behavioral interventions are considered critical to address escalating environmental and health challenges (Chapter 2). A scoping review, using the theoretical domains framework (Cane et al., 2012), showed that environmental and social influences were lacking in the design and measures of studies undertaken in relation to the behaviors of healthcare professionals and medical cannabis (Chapter 3). Based on these findings, we conducted a study to examine social influences on healthcare professionals. Results showed that the more participants identified with their professional group, the greater the influence on group norms related to medical use of cannabis and well-being (Chapter 4). Using new online social group mapping software, we examined the subjective social identities of healthcare professionals who had participated in our previous study. Supergroups and well-being were found to be negatively associated with acceptance of change (Chapter 5). Levels of support from the group influenced group norms related to cannabis, while positivity toward and overlap of group membership effected acceptance of change dimensions (Chapter 6). Overall, identification with professional groups and social identity group measures were found to influence acceptance of change and group norms related to recommending cannabis to patients. These results suggest the importance of the group level of analysis when working in healthcare settings in order to ensure patient-centered effective implementation of changes in policy, process, or treatments.

Keywords: social identities, group norms, change, cannabis

PsycINFO Codes:

3000 Social Psychology
3020 Group & Interpersonal Processes
3360 Health Psychology & Medicine

Table of Contents

List of Figures

List of Tables

List of Abbreviations

AC	acceptance of change
ACS	acceptance of change scale
CBD	cannabidiol
ECS	endocannabinoid system
GPs	general practitioners
MC	medical cannabis
MMAT	mixed method appraisal tool
oSIM	online social identity mapping
PRISMA	Preferred Reporting Items for Systematic Reviews and Metanalyses
SIA	social identity approach
SIC	social identity complexity
SIM	social identity mapping
SIT	social identity theory
TDF	theoretical domains framework
THC	delta-9-tetrahydrocannabinol

Chapter 1

Introduction

Introduction

The interconnection at local and global levels between environmental conditions, diets and health is unquestionable. “They constitute a synergy of epidemics, because they co-occur in time and place, interact with each other to produce complex sequelae, and share common underlying societal drivers” (Swinburn et al., 2019, p. 791). The challenges across these dimensions for humankind are increasing in their number and urgency of impact. There are many actors, groups and organizations that influence the unfolding conditions across health, diet, and environment of what is now considered a global trilemma (Tilman & Clark, 2014).

This global trilemma has emerged over time due to some key collective behaviors and drivers. First, there has been a shift globally from traditional plant-based diets to the modern diet that emphasizes animal products, processed foods, sugar, and fat (Mason-D’Croz et al., 2019). Second, organizations in the food system have used the knowledge of sugar and fat being addictive to drive demand and sales (Mialon et al., 2015). This approach has been successful in influencing consumer behavior and changing the traditional diets of many local communities (Stuckler et al., 2012). Third, the environmental conditions due to pollutants in the air, water, and soil from various interventions have impacted population health (Lawrence et al., 2015). One key consequence of these changes has been an increase in the numbers of children and adults with non-communicable diseases that are triggered by poor food choices, resulting in obesity and poor nutrition (Hawkes & Popkin, 2015).

These global challenges that the world faces require systemic approaches to interventions rather than polarized, agenda-driven positions that hold society back from addressing the root causes (Grohs et al., 2018; Knight et al., 2019). This includes approaches to behavioral change that are widely understood as critical to addressing the challenges of dietary choices, pro-environmental behavior, and health practices. Behavioral models used to design interventions need to be able to address both individual and collective influences on behaviors to ensure the required impacts (Adloff & Neckel, 2019). Underlying most individual behavioral change models is the idea that people make positive choices based on information they receive; this concept is prevalent in health education. This is known as rational decision making; an example is the theory of planned behavior (Ajzen, 2011). Criticism of individual-focused behavioral change models is increasing and is largely due to the assumption that these approaches will not achieve the degree of transformation required to ensure a sustainable society (Peattie & Peattie, 2009; Schlüter et al., 2017; Shove, 2010). Therefore, research and interventions that either move beyond the individual level of analysis or interconnect to group

and societal level influences (Doise, 1980) on behaviors are understood as increasingly important to address the significant changes required.

Social identity theory has extended considerably in social psychology since its initial focus on intergroup relations (Tajfel, 1970; Tajfel & Turner, 1979) and has been applied to numerous behavioral aspects of health, diet, and environmental research (Brown, 2019). Further, the social identity approach (SIA), comprised of social identity theory and self-categorization theory, is now used extensively and offers a wide perspective to study the impact and importance of groups in society (Reicher et al., 2010). Broadly, SIA offers an overarching perspective for emerging areas of research on how social identities (groups that are important to a sense of self) and self-categorization (groups that individuals identify with) influence people through their evolving processes (Lede et al., 2019). This includes outcomes such as norms, attitudes, and behaviors of members within the in-group (Lede et al., 2019). It also extends to relations between in-groups and out-groups, examining such phenomena as discrimination (Verkuyten et al., 2019), stigmatization (Klik et al., 2019), norms, and interacting behaviors between groups.

In the last decade, an extensive body of work has emerged that has applied the SIA to health, in particular the benefits of group membership for health and well-being (S. A. Haslam et al., 2009; Jetten et al., 2015). This body of work is known as the "social cure" (Jetten et al., 2017) and has provided various insights regarding fostering pro-health behaviors through group membership within areas such as diet, exercise, rehabilitation, depression, and addiction recovery (Cruwys et al., 2014; C. Haslam et al., 2010; Stevens et al., 2017). There has been some work done in applying SIA to the clinical workplace and medical education (Burford, 2012; Molleman & Rink, 2015), with an opportunity for greater theoretical coherence of SIA in medicine regarding healthcare professionals' behaviors (Mavor et al., 2017).

Healthcare Professionals

Today, healthcare systems are faced with managing the outcomes of the escalating global environmental, diet, and health related challenges. "Except for a few clinical preventive services, most hospitals and physician offices are repair shops, trying to correct the damage of causes" (Berwick, 2020, p. 225). At the same time, healthcare has also witnessed remarkable scientific and technological changes in the last few decades (Akay & Tamura, 2015). Therefore, health services contend with multiple changes and challenges while managing diminished funding disrupted by modifications in spending in the face of turbulent political

situations (Appleby, 2013). As a result of these interrelated factors, the various organizations delivering healthcare are often in a flux of workplace change and adaptation (Grol & Wensing, 2020). Consequently, healthcare professionals often find themselves in the challenging position of operating at the boundary between public health policies, healthcare organizations, and the public as the shifting social, economic, and health factors drive a myriad of changes in provided services (Montgomery et al., 2019; Wall et al., 2016) while the public, with access to more information than ever before, can be demanding of new treatments or expectations of being a customer. Therefore, healthcare professionals are required to continue to learn and adapt to new processes and practices, which often means a need to change their behaviors.

Professional identities, defined as one's professional self-concept based on beliefs, attributes, values, and experiences, is a type of social identity (Burford, 2012). Professional identities are understood as being very important to healthcare professionals in navigating their work environments. In fact, during medical training, professional identity development is a dimension of education that is understood as critical to the success of graduates (Molleman & Rink, 2015). Therefore, change interventions in healthcare needs to consider social and professional identities. This focus on the group or collective level influences on attitudes, norms, and behaviors, rather than only on individual determinants of behavior, provides a more integrated approach to change interventions and a greater likelihood of successful implementation (Bartunek, 2011; Cain et al., 2018; Korica & Molloy, 2010).

The Specific Case of Cannabis

Cannabis has been part of humanity's botanical history for over 10,000 years and has been touted as the oldest known plant used for fiber, which is still used today (Cherney & Small, 2016). In fact, cannabis-derived products offer sustainable options across each dimension of the food, diet, and environment trilemma. Many cultures have also been exposed to cannabis and often realized its medicinal application (Hand et al., 2016). Cannabis was considered an integral part of available medical treatments up until the 20th century and was the subject of extensive research. However, during the 1930s, cannabis was criminalized in most parts of the Western world (Ablin et al., 2016), predominately due to its remarkable psychoactive properties and the introduction of pharmacological medicine, such as vaccines, analgesics, and the hypodermic needle (Hand et al., 2016). Since then, research has focused on the threats associated with its recreational use, which has heavily influenced studies and policy decisions (Mather et al., 2013).

Over the last 20 years, there has been a resurgence of interest in cannabis as medicine. Specifically, the discovery of the endocannabinoid system in the early 1990s stimulated research beyond palliative uses into the potential of the plant as a cure across areas such as neoplastic, neurological, metabolic, and inflammatory diseases (Brunt et al., 2014). Many countries have since introduced laws and programs to enable patients' use of cannabis for specific symptoms of immobilizing diseases, such as for chronic pain or spasticity (Whiting et al., 2015). Amongst health professionals globally, there is not a unified view of the plant's benefits, and in some cases, it is understood as "not medicine" (Zolotov et al., 2018). This confusion is heavily influenced by historically associated stigmatization of the plant, differing legal status between countries, states, and centralized regulators and the implications for research investment and healthcare bias (Abuhasira et al., 2018).

The Present Dissertation

The criticality of healthcare professionals to engage with and manage the ongoing development of healthcare services amidst challenging contextual factors requires that approaches to ongoing education, workplace culture and social support include a group level of analysis to inform appropriate interventions. In the present dissertation, we take a novel approach by examining the influence of identity processes and group norms on healthcare professionals in relation to recommending cannabis to patients. We found a distinct gap in the literature related to the attitudes and behaviors of healthcare professionals at group level in relation to cannabis. The social influences of group or professional identities were not studied in exploring the implementation of cannabis in healthcare. This then guided our methods in using the SIA (Jetten et al., 2017) and related social identity complexity theory (Roccas & Brewer, 2002) to design studies that examined the influence of professional identities with a new acceptance of change scale (Di Fabio & Gori, 2016) and what this revealed about recommending cannabis. We also used new social identity mapping software (Bentley et al., 2019) to capture qualitative and empirical data related to the social identities of healthcare professionals, the importance of these social identities, their interaction and the overall social identity complexity of each professional and whether these factors influenced attitudes toward accepting change and cannabis.

This thesis therefore had three aims. The **first aim** was to review the existing literature related to the global trilemma of health, diet, and environment and the potential of cannabis as an example of a controversial resource that could be used to combat the trilemma across each

dimension. The **second aim** was to explore the type of behavioral theories used to establish studies or to analyze findings across research that examined the attitudes and behaviors of healthcare professionals in relation to cannabis. We were able to use the theoretical domains framework to undertake this analysis. The **third aim** was to test hypotheses related to SIA and the related social identity measures, thereby examining the influence of social and professional identity attitudes and norms and their influences on healthcare professionals in relation to change and recommending cannabis to patients.

The dissertation is organized in six chapters. **Chapter 1** corresponds to the present chapter where we have outlined the general background and have provided an overview of the macro conditions of the global trilemma's impact on healthcare. We also positioned the *Cannabis* plant within the trilemma and provided the theoretical frameworks supporting our research. In **Chapter 2,** we conducted a literature review focused on the global trilemma, the history of cannabis, and the opportunities this ancient plant offers the modern world across all dimensions of the trilemma. We also argued for collective approaches to behavioral change, particularly in healthcare given the volume of change and number of actors and groups involved in the trilemma. In **Chapter 3,** we carried out a scoping review, using the theoretical domains framework. This review allowed us to analyze research and findings that had been conducted in relation to attitudes, beliefs, and behaviors of healthcare professionals in relation to cannabis. This revealed that social influences and group level analysis of attitudes and behaviors was lacking and contributed to the current varied implementation of medical cannabis.

Then, in **Chapter 4,** we carried out an empirical study that aimed to examine the influence of professional identities on attitudes, norms, and behaviors of healthcare professionals in the United Kingdom in relation to recommending cannabis. In line with the SIA, we expected that those participants who identified more highly with their professional group would be more influenced by group norms in relation to recommending cannabis. We also expected that well-being would be influenced by levels of identification with the group. In **Chapter 5,** a quantitative study using new social identity mapping software facilitated the examination of the influence of multiple social identities on healthcare professionals in relation to change. Through the software, we were able to analyze the subjective social identity structures created by each participant. We examined the influence of the group categories created by individuals in relation to change using a positive psychology acceptance of change scale. In **Chapter 6**, we used the mapping software to evaluate the influence of social identity measures on attitudes toward cannabis and acceptance of change. We expected that the

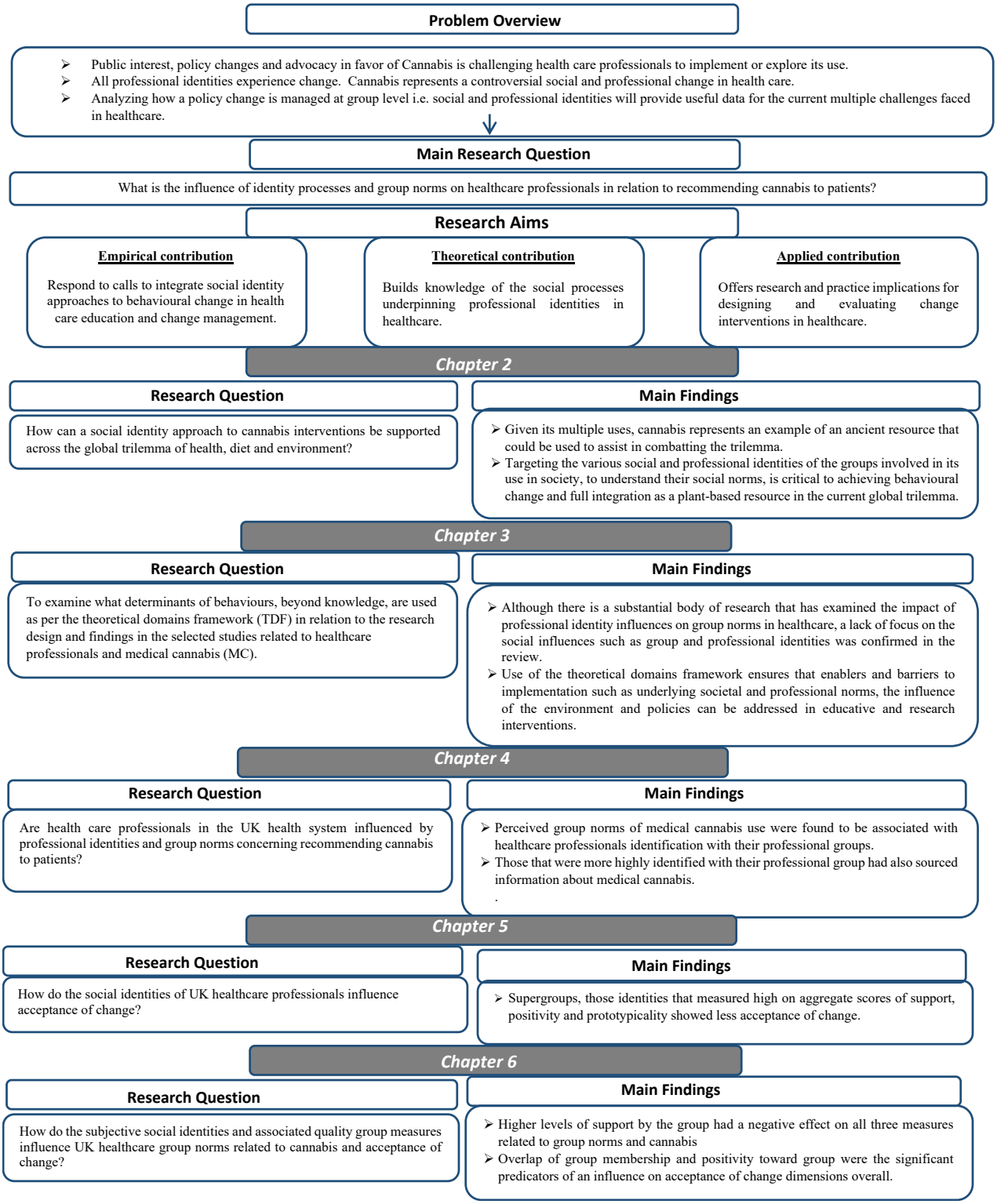
different identities and the quality of membership perceived by participants would influence attitudes toward cannabis and dimensions of change.

Chapter 7 provided a summary and discussion of the main findings, particularly in regard to the influence of identity processes and group norms on healthcare professionals in relation to recommending cannabis to patients. In addition to the key contributions on both theoretical and applied levels, we highlighted the relevance of our findings to inform and support change interventions in healthcare. Limitations of the present research and suggestions for future studies were also included.

Figure 1 depicts a schematic view of several sections of the thesis. This provides a visual outline of the sequence of the studies undertaken and the key findings.

Figure 1

Thesis Framework



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Chapter 2

Health, Diet and Environment: A Global Trilemma

Abstract

Shifting habits toward more global and local food plant-based solutions is considered fundamental to ensuring sustainable and healthy food options. Theories and models of behavioral change that provide pathways for sustainable collective impact are regarded as increasingly important with an emerging perspective that taking only an individualistic view of behavior will not provide the timely social changes required. The intersection of challenges across the dimensions of health, diet, and environment, considered a global trilemma, are increasing in their significance and negative impacts on all living things on the planet. We propose that taking a social identity approach provides a collective view of behavior that can inform navigation through the global trilemma. We exemplify our point with the case of cannabis, a beneficial resource across all three dimensions of the trilemma. To embrace behavioral interventions that promote the use of this plant, an emphasis on psycho-social variables, such as social norms and social identities, is needed.

Keywords: social identity approach, cannabis, global trilemma, health, diet, environment

Introduction

The implementation of interventions to combat the interconnected "diet-environment-health trilemma is a global challenge" (Tilman & Clark, 2014, p. 518). There is an opportunity for appropriate dietary shifts given the current impacts across environmental and public health. This trilemma involves the intersecting challenges of a rise in non-communicable diseases linked to dietary changes and pressure on the food system and production amidst a backdrop of environmental flux. These challenges are the outcome of collective social processes. They have shaped choices, agendas, and behaviors related to how people live and share resources on the planet, and this trilemma has mainly been approached from an economic or environmental perspective. However, a social identity approach to the trilemma in which the criticality of social groups and their norms is understood concurrently with the individual psychological identification with those groups may be beneficial to this problem. Social groups and their norms are particularly important when behavioral changes are required at collective levels across society to ensure ongoing health and well-being of the whole.

Specifically, we focus on a collective view of behavioral change through social identities by using the case of a versatile plant: *Cannabis*. Policy changes related to cannabis for recreational and medical use are occurring across the world. Thirty countries have approved medical cannabis in some capacity over the last decade. The history of cannabis as controversial has resulted in it being both maligned and revered, depending on the social groups involved. Meanwhile, given the breadth of potential uses of the *Cannabis* plant, the plant represents an example of an ancient resource that could be used to assist in combatting the trilemma. However, even though the policy changes are currently occurring, there is confusion, opposing views, and increasing public pressure toward groups involved in the changes, such as in healthcare.

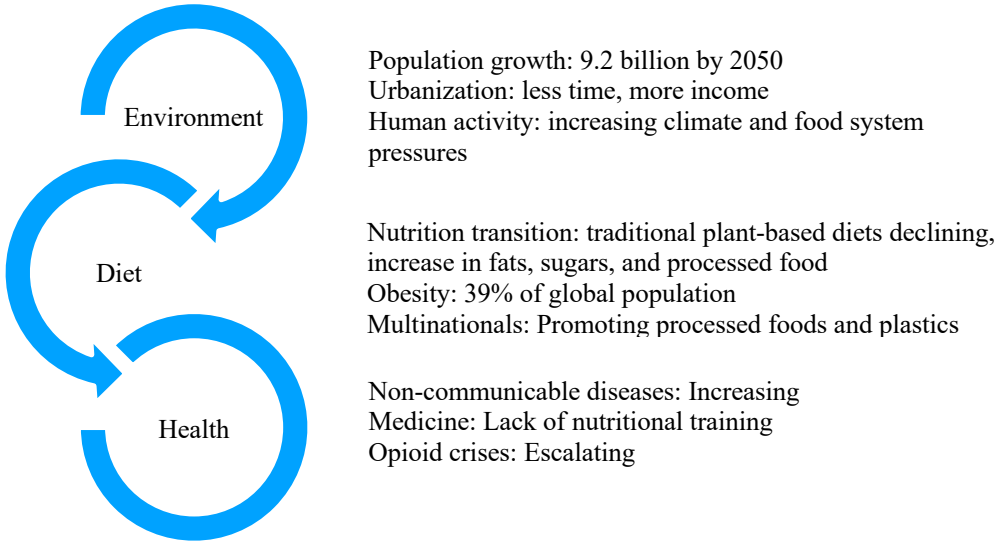
In this paper, we first describe the challenges of the trilemma associated with health, environment, and diet and advocate for the importance of (a) developing plant-based solutions to the trilemma and (b) using a social identity perspective in intervention to promote sustainable behavioral changes. In the second part of this paper, the return of traditional uses of cannabis is used as an example of a plant-based focus on solutions and of the importance of this social perspective to guide interventions.

Global Perspectives on Diet Behaviors

A summary of the interrelated trends occurring globally is outlined in the following section. Underpinning these trends are the behavioral changes that have been influenced by urbanization, marketing, food system supply, and packaging and lifestyle changes. Each of these dimensions of the trilemma cannot be viewed in isolation; they are interconnected, with a change in one area impacting another. Figure 2 outlines the key aspects of the trilemma.

Figure 2

Summary of the Key Trends of the Trilemma



Diet-Environment-Health: The Trilemma

Urbanization and rising incomes have been causing a trend away from traditional diets and toward foods higher in refined sugars, refined fats, oils, and meats. This dietary shift, understood as a "nutrition transition", has been linked to obesity in public health and epidemiological studies in which there is the "double burden" of malnutrition. This double burden occurs when undernutrition coexists with obesity within the same group of people at the national, community, or household levels (Swinburn et al., 2019). Obesity in childhood and adolescence is associated with a higher risk of adult obesity and with premature death and disability due to non-communicable diseases, such as coronary heart disease. In 2016,

approximately 340 million children and adolescents aged 5 to 19 years, or almost one in every five (18.4%), were overweight or obese globally (World Health Organization, 2016).

Another impact of this dietary shift has been an increase in chronic non-communicable diseases, such as type 2 diabetes, various cancers, and cardiovascular diseases (Wagner & Brath, 2012). Diet-related, non-communicable diseases are impacting an increasing number of children and adults across the globe (Hawkes & Popkin, 2015). This impact has been particularly noticeable in China and in other countries, such as Mexico and India (Wagner & Brath, 2012). This has occurred through rising urbanization, contributing to increased calorie intake of inexpensive processed food (Popkin et al., 2012) and more Western-style diets (high meat, dairy, and refined carbohydrates) steadily replacing traditional plant-based diets.

However, diets cannot be taken out of context with other changes in modern lifestyles. There has been increasing demand for convenience foods as more women have entered the workforce globally over the last 50 years. Without the same amount of time for food preparation, people have sought food options based on accessibility and convenience (Gupta & Singh, 2016). Further, there have been huge declines in physical activity as advances in modern technology have expanded rapidly into all sectors of life. Because of this decreased movement, more calories are consumed than required for energy (Ding et al., 2016).

Food choices are not always rational or steeped in scientific accuracy. They are strongly influenced by social, economic, and environmental factors (Hardcastle et al., 2015). The world's food system is "not a competitive marketplace … but an oligopoly" (Stuckler & Nestle, 2012, para. 2). Multinationals have heavily influenced the global rise in consumption of sugar-sweetened beverages and processed foods enriched in salt, sugar, and saturated fat (Stuckler et al., 2012) (Garcia et al., 2020) Increasing consumption of these products is connected to rising levels of obesity and diabetes (Basu et al., 2014). Companies' marketing imperatives are driven by economic factors and can further cause confusion to consumers in relation to healthy choices (Pierce & Witten, 2016).

Most people also prefer sweet foods and those that are energy dense (i.e., high in fat, calories, and sugar), which heavily influences the production of food products and menus in restaurants (Lustig et al., 2012). These preferences are highly addictive and often lead to people wanting to consume more of them (Schulte et al., 2015). Further, product packaging for consumer convenience, and therefore increased demand, has resulted in a global domination of plastic (Brooks et al., 2018). Plastics' largest market globally is packaging (40%; Geyer et al., 2017); the growth in this function was accelerated by a global shift from reusable to single-use containers. Plastic has outperformed almost all other manufactured materials from 2

million metric tons (MT) produced in 1950 to 322 million MT produced in 2015 (Poore & Nemecek, 2018). Only 9% of plastic waste has been recycled globally, with the devastating majority of global plastic waste being landfilled or contaminating the environment (80%; Geyer et al., 2017).

A challenging and important gap exists between the shifting national diet trends of many countries and the health services provided in practice. This gap is the lack of nutritional knowledge of health workers in the prevention and treatment of rising non-communicable diseases (Laur et al., 2016) and malnutrition (Vetter et al., 2008). Various studies have identified that physician practice related to addressing the nutrition aspects of diseases, such as cancer, obesity, and diabetes, are hindered by lack of knowledge (Aggarwal et al., 2018). This lack of knowledge results in a lack of confidence to provide adequate nutritional interventions as treatment strategies (Perlstein et al., 2016).

Traditionally, health services have tended toward a reactive approach, providing treatment post-onset of diseases, with limited attempts at prevention and prediction (Sugeir & Naylor, 2018). Currently, countries such as the United States, Canada, Australia, and the UK are experiencing an increase in opioid prescriptions. Opioids are used to treat moderate to severe pain and can also make many people feel relaxed and euphoric; as a result, they can be psychologically and physically addictive. The subsequent addiction situation in the United States is described as a crisis, and on average, 130 Americans die of opioid overdose each day (D. H. Lin et al., 2017). The increase in opioid prescriptions began in the early 1990s and was influenced by assurances from pharmaceutical companies and medical groups that the risk of addiction to prescription opioids was low. This assurance was given in spite of a lack of longitudinal studies and data regarding the consequences of long-term uses. Pharmaceutical companies also began to promote the use of opioids in patients with non-cancer related pain (Kolodny et al., 2015).

A strong link between medical services and pharmaceutical companies who produce drugs to treat symptoms exists. There are some commonly documented dynamics in the medical field; for example, more than 80% of physicians have relationships with the pharmaceutical industry in the United States and Europe (Lieb & Scheurich, 2014). Physicians who attend conferences funded by pharmaceutical companies have been found to have higher prescription rates than those that do not (Rosenbaum, 2015). The global pharmaceutical market, with a value of €933 billion in 2016, is forecast to expand to €1,159 billion, with a 4.4% compound annual growth rate (Business Monitor International, 2017).

By 2050, if these dietary trends continue, they will be a significant contributor to the predicted 80% increase in global agricultural greenhouse gas emissions from food production (Myers et al., 2017). Specifically, the production of animal products has a much greater impact on the environment than those of vegetable substitutes. Currently, meat, eggs, aquaculture, and dairy utilize "83% of the world's farming land, contribute to 58% of food's various emissions whilst only delivering 37% of our protein and 18% of our calories" (Poore & Nemecek, 2018, p. 990). These threats to sustainability and public health are not new; however, they are occurring swiftly and are complex (Lawrence et al., 2015).

Food consumption is known to be the key cause for the destruction of the environment around the world. The choices made with regard to diet have now become chief causes for an aggregate of 26% of harmful greenhouse gas emissions (Clark & Tilman, 2017). The current agricultural system is also extremely resource intensive, "covering 43% of the world's ice- and desert-free land. Of this land, 87% is for food and 13% is for biofuels and textile crops or is allocated to non-food uses such as wool and leather" (Poore & Nemecek, 2018, p. 987). The use of fertilizers to support this production causes nutrient pollution. This kind of pollution, in turn, results in the establishment of multiple zones of dead marine life globally. Thus, the production of food clearly poses a threat to the existence of both plant and animal life (Nemecek et al 2016).

Plant-Based Options as a Response to the Trilemma

Reducing the amount of animal-based foods in our diets can result in benefits to public health and the environment (Springmann et al., 2016). 'The evidence is strong, consistent, and compelling that a diet of predominantly, or even exclusively, whole plant foods can promote health, selectively treat and reverse disease, and confer comparable benefit to the planet' (Katz, 2019). Meanwhile, perspectives regarding what constitutes the ideal diet for optimal environmental and physical health are varied, and much debate occurs in both the scientific and public arenas. Experts from each dietary plan have a plethora of data supporting why their particular diet is best. There are national and international healthy portion sizes and recommended daily allowances of differing foodstuffs based upon caloric content and cultural, historic, and economic factors.

Many studies have expressed the challenges of identifying people eating in perfect concordance with global dietary guidelines (Reynolds et al., 2014). One reason for this variation is that available foods for the various dietary guidelines are vast. In addition, any diet

that reduces caloric intake will most likely result in weight loss (Johnston et al., 2014) but may not necessarily be the most healthy in terms of nutrition. However, the basics of nearly all diet plans associated with meaningful evidence of health benefits overlap substantially (Katz & Meller, 2014).

A diet of minimally processed foods that are close to nature, predominantly plants, is decisively associated with health promotion and disease prevention and is consistent with the significant components of seemingly distinct dietary approaches (Neacsu et al., 2016). Epidemiological studies have indicated that the inclusion of whole grain, fiber, fruits, and vegetables within diets during early life (ages 8 years and under) are associated with reduced cancer risk and have the strongest association with cancer incidence (Kerr et al., 2017). A plant-based diet aims to maximize consumption of nutrient-dense plant foods, whilst minimizing processed and animal foods, including dairy. This diet encourages cooked or raw vegetables as the basis of meals; is generally low fat; and suggests fruits, legumes, seeds, and nuts in smaller quantities (Tuso et al., 2013). Inadequate consumption of fruits and vegetables globally contributes to diet-related disease and malnutrition (Schulte et al., 2015)

The theory of food synergy postulates that individual foods act together in the body to create healthy outcomes. Multiple nutrients work together to both protect and heal the body (Jacobs, 2014). Further, "the isolated compounds as dietary supplements in pure form may not work in the same way as the compounds in whole foods and, in addition to having fewer of the beneficial effects, may be potentially detrimental" (Liu, 2013, p. 389S). Thus, the emerging view is that a holistic approach needs to be taken in the selection of plant-based foods, whereby a broad range of fruits and vegetables are eaten (Fardet & Rock, 2014), rather than relying on supplements. This holistic approach is increasingly seen as important in which diet is used to support healing in chronic non-communicable diseases, particularly in the treatment of cancer (Crous-Bou et al., 2019; Demark-Wahnefried et al., 2015.

The global food system is generally composed of groups of producers, wholesalers, processors, distributors, retailers, and consumers. For producers, there are multiple options to reduce environmental impacts, and these options are dependent on the context. Some practice modifications can be applied across all producers and rely on policy revisions to ensure behavioral changes for implementation (Poore & Nemecek, 2018). Retailers can influence positive environmental and health changes across the supply chain, and consumers potentially have greater influence on these changes when considered at the group level rather than the individual level. For example, consumers collectively moving away from the current dependence on animal-based diets to plant-based diets has transformative potential, reducing

food's land use by approximately 76% (Springmann et al., 2016) and contributing to overall health and environmental benefits.

The following table summarizes the main points discussed in this section and the opportunities to expand the current plant usage paradigms to plant-based solutions in response to the trilemma. These responses require significant behavioral shifts across various social groups (see Table 1).

Table 1

Plant Paradigms and Suggested Trilemma Responses

Plants as a resource	Current paradigm	Trilemma responses
Food	Diet and nutrients	Holistic approach – consume a wide range of plant-based foods and more regularly
Medicine	Pharmacology	500,000 plant species, only small % researched for bioactivities
Environment	Mass agriculture	Decrease use of pesticides and lower greenhouse gas emissions
Commodity	Subject to subsidies and can be undervalued	Reconnect humans to locally sourced food

Behavioral Change: A Social Identities Approach

The challenge of provoking behavior change across dietary choices, pro-environmental behavior, or health practices has resulted in a torrent of tools, methods, and experiments being proposed. Notwithstanding the important differences between them, most behavioral change models assume that people are able to make positive choices for themselves based on the information they receive; this idea is particularly prevalent in health education. The majority of behavioral interventions use rational decision-making models (the most common is the theory of planned behavior; Ajzen, 2011). This decision-making approach has recently been challenged by nudge theory (Arno & Thomas, 2016). Nudge theory suggests that humans do not always assess information rationally: responses are automatic, are driven by immediate feelings, and are prompted by environments. Governments are increasingly using nudge theory in shaping public policy, particularly in health, through social marketing campaigns (Marteau et al., 2011)

The interventions associated with these behavioral models are often tailored and targeted to focus on the behavioral change of each individual. Even when these models are

more complex and differentiate between stages of experience and change, the main predictors of behavior are individual attributes, such as choices related to consuming more vegetables (Godinho et al., 2013). These theories are increasingly coming under scrutiny regarding the behavioral changes required for collective impact to achieve the significant outcomes needed to combat the global trilemma (Peattie & Peattie, 2009; Rundle-Thiele et al., 2019). The main criticism of the theories focusing on changing individual behaviors is that they will not achieve the degree of transformation required to ensure a sustainable society (Adloff & Neckel, 2019; Shove, 2010). However, in social psychology, a significant body of work has focused on a more collective understanding of behavior change.

Intent on seeking an alternative to the prevailing individualism he felt was present in social psychology at the time, Tajfel and those he worked with were keen to make sense of the violent intergroup relations surrounding the Holocaust and World War II (Tajfel & Turner, 1979). Central to this work was the theoretical perspective that people are not randomly interacting individual particles (Tajfel, 1981); instead, people act on the basis of understanding themselves as group members. Social identity theory was then extended by self-categorization theory (Turner et al., 1987). This theory investigated the processes of categorization that result in individuals being unified in psychological groups (Hornsey, 2008) These two theories form the basis of the social identity approach (SIA), which describes the intersection between individuals with social realities and the evolving group-level phenomena within and between groups (Abrams & Hogg, 1990).

The SIA acknowledges the challenges inherent in social change and in achieving collective impact. The theory accomplishes this by working at the group level of analysis in relation to intergroup power constructs, intragroup dynamics, alliances, and conflicts, as well as the contextual influences that shape norms, values, emotions, and behavior. Furthermore, the SIA has provided insights into how individuals and groups mutually influence each other. While individuals are influenced by group norms, norms are continuously shaped by individuals through challenges, discussion, and behaviors (Hogg et al. 2017; Hornsey, 2008; Smith & Louis, 2008). Leadership is critical to social change, and the SIA has also examined why people authorize others to lead, the centrality of implicit power relations in the process and why people may or may not follow (Hogg, 2010). Increasingly, the SIA has been harnessed to move beyond an individualistic understanding of behaviors to what these insights may suggest regarding interventions for social change across health, diet, and environment

The SIA in relation to health has emerged over the last decade and has resulted in analyses that integrate the psychological and social dimensions of health and that offer

effective approaches to managing various health conditions. This research has worked to develop a framework that integrates the biological, psychological, and social approaches to health to ensure that a comprehensible view of the interconnectedness between both fields of psychology and social factors is established. The focus is on the group level of analysis and the influence the group (we) has on the individual (I). This work is known as the "social cure" (Jetten et al., 2014) and is broadly encompassed in the following hypothesis: "Because it is the basis for meaningful group life, social identity is central to both good and ill health" (Haslam et al., 2018, p. 17). Research across health and diet has confirmed this hypothesis and has established the criticality of social identities indicating and influencing social norms (expected behaviors of people in society) resulting in positive health outcomes.

Social identity through group membership offers a sense of groundedness, direction, and meaning in people's lives (Jetten et al., 2012). Specifically, self-esteem is impacted through group membership that provides a positive identity (Turner, 1982). If the group is perceived to be meaningful and relevant to the self, people are more likely to enact the norms of that social group. These group norms are internalized in people's self-concept, which in turn increases their impetus to perform specific behaviors (Hogg & Vaughan, 2002). This SIA, applied across health, diet, and environment, provides an cohesive view of why people behave as they do. For example, behaviors related to food choices and healthy eating have been studied, with cumulative evidence indicating the influence of social norms on dietary behaviors (Burger et al., 2010; Higgs, 2015). Further, social groups are powerful determinants of physical activity-related behavior (M. Stevens et al., 2017), and behaviors such as smoking are influenced by social norms (Luís & Palma-Oliveira, 2015). More recently, the SIA has been applied to conflicting aspects of environmental and natural resource management whereby stakeholders' behaviors are better understood in relation to group membership, not only instrumental aims (Colvin et al., 2015).

The Specific Case of Cannabis

The Attributes and Traditional Uses of the Plant

Cannabis has been part of humanity's botanical history for over 10,000 years. Asia is believed to be the main location for its natural origin and use. Specifically, Neolithic evidence was found in Taiwan suggesting that cannabis was used for several different purposes, with a particular role in early textile and cordage production (C. J. Stevens et al., 2016). This plant has been touted as the oldest known plant used for fiber and is still used today (Cherney &

Small, 2016). Once plant cultivation emerged, people began producing their own food. This production shifted the subsistence pattern of living to one based on the farming economy. As an easily cultivated plant, cannabis provided a variety of resources and as such, played a significant role in the establishment of agriculture in Central Asia and Northern China (Clarke & Merlin, 2013).

Across the centuries, cannabis has also been used for oil, medicine, and religious purposes (Piluzza et al., 2013). The plant has been recognized as sacred by several religions (Touw, 1981) and honored as a "plant teacher" for personal and collective guidance in the rituals and ceremonies of many traditional societies (Sayin, 2014), providing elements of ethnological myths and social identity across these societies (Ullah et al., 2013). Many cultures have also been exposed to cannabis and often realized its medicinal properties (Hand et al., 2016).

Cannabis sativa L. (*C. sativa*) is an herbaceous annual plant that contains a number of chemically active compounds, such as cannabinoids, terpenoids, flavonoids, and alkaloids (Andre et al., 2016). The most active compounds are the cannabinoids, a class of terpenophenolic compounds that accumulate mainly in the trichome cavity of female flowers. In over 100 cannabinoids identified so far, the most potent is delta-9-tetrahydrocannabinol (THC), mainly responsible for psychoactive effects (Whiting et al., 2015). *Cannabis sativa* L. (commonly known as "hemp" when strains are grown for food and fiber) has low levels of THC, 0.2%, and as such cannot be used as an inebriant.

The entire hemp plant can be used to produce products. Hemp is a natural bast fiber, and approximately 25,000 different products are made from industrial hemp (White, 1999). This fiber is used to make apparel products as well as paper; cosmetics; carpets and other home furnishings; textiles; salad oil; construction materials biodegradable auto parts; and hormone-free, steroid-free, and antibiotic-free animal food (Kadolph & Marcketti, 2007). Hemp is resistant to insects and fungus and, therefore, does not require fertilizers or pesticides. Furthermore, the plant can also be used to extract pollutants, such as mercury and zinc, from the soil. Hemp's growing cycles are shorter, and its yields are 25% greater, than cotton. Moreover, the plant can also be grown in a number of climates. The development of new technologies continually expands the potential uses of hemp, particularly as a model for sustainable development (T. Lin et al., 2005).

Medical Uses of Cannabis and the Trilemma

The nutritional and health benefits of hemp come from the fiber, protein, and oil content of the plant. Hemp is an excellent source of plant-based protein, second only to soybeans. The shelled seeds of the hemp plant contain about 35% essential fatty acids and 33% plant protein. These seeds contain all nine essential amino acids and are an abundant source of gamma-linolenic acid, as well as dietary fiber (Mihoc et al., 2012). Hemp is considered a functional food, so beyond the basic nutritional benefits, it provides significant benefits for health and well-being while decreasing the risk of illness (Crescente et al., 2018). Hemp oil, seed meal, or seeds are an excellent dietary choice in both the prevention and dietary support in the treatment of non-communicable diseases (Callaway, 2004).

Many cultures have realized the medicinal application of cannabis over the past few thousand years. The plant was introduced to Western medicine in the 19th century and gained popularity as an analgesic, anticonvulsive and hypnotic (Hand et al., 2016). Until the 20th century, cannabis was considered an integral part of available medical treatments and was the subject of extensive research. However, during the 1930s, cannabis was criminalized in most parts of the Western world (Ablin et al., 2016) predominately due to its remarkable psychoactive properties and the introduction of pharmacological medicine, such as vaccines, analgesics, and the hypodermic needle (Hand et al., 2016). Since then, the potential medical benefits of cannabis pharmacotherapy have been largely ignored. Instead, the focus has been on the threats associated with its recreational use, which has heavily influenced research and policy decisions (Mather et al., 2013).

There has been a resurgence of interest in cannabis as medicine over the last 20 years. Specifically, in the early 1990s, the discovery of the endocannabinoid system prompted research beyond palliative uses into the potential of the plant as a cure across areas such as neoplastic, neurological, metabolic, and inflammatory diseases (Brunt et al., 2014). Medical cannabis now refers to the use of cannabis and its derivatives to treat disease and to relieve symptoms. In recent years, a number of countries have introduced laws and programs to enable patients' use of cannabis for specific symptoms of disabling diseases, such as chronic pain or spasticity (Whiting et al., 2015). Currently, there is a lack of consistency across healthcare in relation to the use of cannabis as it is generally viewed as a palliative intervention rather than a cure. Patients are active in seeking treatments, and physicians decide when cannabis should be prescribed and which patients could benefit from the treatment (Sagy et al., 2018). Amongst health professionals globally, there is not a unified view of the plant's benefits, and in some

cases, it is understood as “not medicine” (Zolotov et al., 2018). This confusion is heavily influenced by differing legal status between countries, states, and centralized regulators and the implications for research investment and healthcare bias (Abuhasira et al., 2018).

Behavioral Change in Relation to Cannabis Use and the Importance of Social Identities

All individuals inhabit various social identities that assist in their understanding of their place in the world (Crisp & Turner, 2014). These identities are associated with normative standards for thought and action. These norms provide frameworks for people to identify the most appropriate actions in any situation (Hirsh & Kang, 2016). People who share a social identity generally have common feelings, attitudes, and values. Professionals across health, diet, and environment are influenced by the norms of those social identities (Schulte et al., 2015). These identities vary in their knowledge, beliefs, norms, and behaviors pertaining to cannabis and greatly contribute to the levels of acceptance, rejection, or ambivalence and subsequent use of this plant in its various forms in society. In order to develop interventions to change behaviors at a group or collective level, an understanding of “why” current behaviors occur in relation to cannabis and what needs to change in order to bring about desired behaviors is fundamental. The SIA provides a group level of analysis to ascertain the current influence of groups on the behaviors of members.

The introduction of cannabis has challenged prevailing professional identities and social norms. In healthcare, for example, a once maligned drug is now a medicine for health professionals to utilize. Although policy changes have occurred in relation to cannabis being introduced into healthcare as medicine, controversy still surrounds medical cannabis, with conflicting views related to its efficacy and safety (Hand et al., 2016) A noticeable difference in behaviors is linked to work practices and treatments. For example, professionals working within pain management and with end-of-life patients are more open to and are actively engaging with cannabis in their practice (Gardiner et al., 2019), whereas other professionals do not believe in the efficacy of cannabis in treatment. Understanding behaviors of professional identities and norms is an evolving process occurring through the external influence of public policy (Luís & Palma-Oliveira, 2015) and through the active engagement by professionals with changes at a group level, such as in the case of new technologies or treatments (Korica & Molloy, 2010).

Conclusion

The multiple challenges of the global trilemma across health, diet, and environment require significant collective behavioral changes throughout society. The current outcomes place significant pressure on health and environment: there has been a substantial rise in non-communicable diseases amidst the backdrop of alarming environmental degradation. Integral to positive changes are plant-based solutions developed by producers, promoted by marketers, offered by retailers, and chosen by consumers across the food system. Traditionally, an individual approach to behavioral change has dominated the theory in explaining how people make food choices. The premise is that sufficiently educated people make informed choices that benefit their health. This individual view is now being challenged given the slow pace of behavioral change amidst the rapid shifts needed. We suggest that interventions focusing on collective- and group-based behavioral change and influence are required. Specifically, we propose that the SIA offers a lens to understand how the social norms of those groups offer a meaningful sense of who individuals are and inhibit or enable behaviors regarding their health and well-being. Cannabis is an example of a plant-based solution that can provide alternative sustainable options across the trilemma as a medicine, food, and fiber. However, because the plant has been maligned historically, the current policy changes related to its use as a medicine remains controversial. Targeting the various social and professional identities of the groups involved in its use in society, to understand their past and current social norms, is critical to achieving behavioral change and full integration as a plant-based resource in the current global trilemma.

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Chapter 3

Healthcare Professionals and Medical Cannabis: A Scoping Review Informed by the Theoretical Domains Framework

This chapter is based on the paper

O'Rourke R., Lima, M. L., & Jetten, J. (2021). Healthcare professionals and medical cannabis: A scoping review informed by the theoretical domains framework. *Journal of Public Health*. Advance online publication. https://doi.org/10.1007/s10389-021-01624-9

Abstract

The use of medical cannabis has been legalized in various countries and states over the last 10 years. This rapid change from ‘drug’ to ‘medicine’ and contradictory laws have undermined the consistent implementation of medical cannabis in healthcare. This scoping review aims to examine what determinants of behaviors are used as per the theoretical domains framework (TDF) in relation to the research design and findings in the selected studies related to healthcare professionals and medical cannabis. Given the controversy surrounding cannabis, we are interested in whether social factors are used to either design studies or analyze results. Based on the preferred reporting items for systematic reviews and meta-analyses guidelines, 34 publications were identified that met the inclusion criteria related to knowledge, attitudes, and behaviors. Data synthesis of the evidence base used the TDF to examine the influences on healthcare professionals related to medical cannabis that was outlined in each of the selected studies. The domains most frequently identified were knowledge, beliefs about consequences, environmental context and resources, social influences, and skills. Findings show that a focus on knowledge in the studies resulted in suggestions to improve education and ongoing training for professionals. This is not the only challenge to the implementation of medical cannabis in healthcare. Further consideration of the multiple factors that influence behaviors of professional healthcare groups, particularly social and professional group influences, as outlined in the TDF, will support more consistent implementation of medical cannabis.

Keywords: cannabis, attitudes, knowledge, behaviors, theoretical domains framework, healthcare, professional identities

Introduction

Cannabis is a plant of the Cannabaceae family and contains more than 80 biologically active chemical compounds. The most commonly known compounds are delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). Until the 20th century, cannabis was considered an integral part of medical treatment and was the subject of extensive research (Russo, 2007). However, during the 1930s, an anti-cannabis campaign was undertaken by the Federal Bureau of Narcotics in the United States because of the alleged dangers of "marijuana" for health and broader society. As a result, cannabis became criminalized in most parts of the Western world (Rasmusson, 2014). Subsequently, the potential medical benefits of cannabis pharmacotherapy were primarily overlooked, with research and society's attention, in most parts of the world, directed toward the hazards of its recreational use (Mather et al., 2013).

At a federal level in the United States, the law currently lists cannabis as a Schedule 1 narcotic, and its use is prohibited for any reason. In spite of this law being in place, 30 states and Washington D.C. have legalized medical cannabis (MC; Mead, 2019). The European Medicines Agency has not granted marketing authorization for medicines derived from cannabis. As a result, many European countries have authorized, by the non-centralized route, the use of some cannabinoid-based medicines (Sagy et al., 2018).

This lack of central agency approval contributes to limited cannabis-based research. Although there is research on cannabis, it remains restricted by prohibitive policies. Consequently, the evidence-based use of cannabis is minimal, and health professionals face multiple areas of uncertainty regarding the rational use of these compounds. At the same time, increased public interest and advocacy in favor of MC means the issue is frequently encountered by medical professionals in different fields of medicine (Vyas et al., 2018).

Medical Cannabis

Since the discovery of the endocannabinoid system (ECS) in the 90s, research into the medical benefits of cannabis has been re-ignited (Crocq, 2020). Research has confirmed that the ECS plays a key role in modulating states in inflammatory, neurodegenerative, gastrointestinal, metabolic, and cardiovascular diseases, as well as cancer and pain (Navarrete et al., 2020). Ongoing investigation continues into the ECS; currently, MC refers to the use of cannabis and its derivatives to treat neoplastic, neurological, metabolic, and inflammatory based diseases (Fonseca et al., 2017; Maroon & Bost, 2018)

Medical practice increasingly has been molded by evidence-based medicine over the last 25 years. Evidence-based medicine is defined as individual clinical expertise, best research evidence, and patient values and circumstances (Szajewska, 2018). Traditionally, pharmaceutical companies have supported expensive and time-intensive clinical trials for drugs, with exclusive patents ensuring rights to the products. Cannabis patents are an emerging area globally, with patents not available in the United States (Crocker, 2019), which also contributes to the lack of evidence-based studies due to limited financial incentives to undertake the research.

Policy Changes and implementation

Across society, differing attitudes toward plants such as cannabis influence laws, social norms, and regulations. Historical influences toward MC may include narratives such as "the 'war on drugs,' fears of addiction, and stereotypes of drug users and addicts" (Andreae et al., 2016, p. 40). Despite the currently occurring MC policy changes, there is confusion, opposing views, and increasing public pressure toward groups involved in the changes, such as in healthcare. Healthcare professionals are not immune to social influences, and their differing views also impede or enable effective implementation and use of MC.

Social Influences

Social influences such as social and group norms are particularly relevant to understanding the behaviors of healthcare professionals during policy changes and implementation. The social identity approach provides analysis at a group level to determine the influence that the group has on the behaviors of members (Hogg & Reid, 2006). For example, when a social identity, such as professional nurse, is more salient (i.e. identification with a group), the higher the probability that an individual will behave in accordance with that identity; for example, nurses updating their own vaccines due to considering this behavior as a norm of their professional identities (Falomir-Pichastor et al., 2009). Social identities are associated with normative standards for thought and action. Norms provide frameworks for people to identify the most appropriate behaviors in any situation (Hirsch & Kang, 2016).

Behaviors

A systematic review examining health professional beliefs, knowledge, and concerns surrounding MC was undertaken by Gardiner et al. (2019). This review included 26 studies

and sought to examine the feelings, knowledge, and concerns of health professionals regarding MC. The overarching results of this review indicated a lack of self-perceived clinical knowledge occurring simultaneously with supportive beliefs about clinical usefulness. In regard to feelings and concerns examined in the review, the researchers acknowledged that a key limitation of the studies overall was the implicit use of the common-sense model of behavior.

More broadly, it has been noted in systematic reviews of interventions, designed to change professional practice in healthcare, that there is a lack in the use of theory to guide intervention design or to evaluate implementation problems (Baker et al., 2015). Alderson (1998) argued that it is important to examine theories, "as they powerfully influence how evidence is collected, analyzed, understood and used" (p. 1007) and suggested that "when theories are implicit, their power to clarify or to confuse, and to reveal or obscure new insights, can work unnoticed" (p. 1007). The lack of theoretical focus on the behavioral dimensions in both the aforementioned systematic review of healthcare professionals and cannabis, and more widely in practice change research, strongly influenced our approach in using the theoretical domains framework (TDF) as the basis for analysis in the current review. The TDF enables a comprehensive appraisal of approaches taken in the research selected for review in relation to the determinants of behavior, revealing possible gaps and opportunities for both evaluation and intervention designs.

Theoretical Domains Framework

The attitudes, beliefs, and behaviors of healthcare professionals are critical to ensuring effective execution of any new policy, process, or treatment changes in healthcare. The TDF assists researchers and practitioners in examining the barriers and facilitators to implementing changes in healthcare from a behavioral perspective. The TDF has been used as the basis of studies across various designs and objectives in healthcare. For example, it has been used to identify influences on implementing specific evidence-based behaviors, systematic intervention design, process evaluation of randomized trials to understand the impact of implementing evidence, and guidance toward identifying behavioral change techniques (Atkins et al., 2017).

The framework was developed using a consensus approach among health psychology theorists, health service researchers, and health psychologists to simplify behavior change related theories and to improve access to psychological theory. The first version was published

by Michie et al. in 2005, and a subsequent version following a validation exercise was published by Cane et al. in 2012. The TDF domains are considered representative of the range of relevant theoretical constructs that may influence healthcare. The TDF provides a high-level explanation for constructs related to both individual and collective (e.g., organization) level change (Francis et al., 2012). During the development of the TDF, the consensus group identified existing behavior change theories applicable to healthcare professionals' behaviors, deconstructed these theories, and synthesized the constructs into one framework of 14 domains. The TDF is comprised of 14 theoretical domains taken from 33 theories and 128 constructs (see Appendix A).

In recent years, the TDF has been used extensively when examining the influence on healthcare professional behaviors as a result of policy (Cross et al., 2019; Faija et al., 2020; Sissons et al., 2020) and clinical practice changes (Anekwe et al., 2020; Haskell et al., 2020; Pearse et al., 2020). The TDF has also been used in patient and caregiver behavioral research (Hayes et al., 2020; Quigley et al., 2019; Wshah et al., 2020).

The Present Study

The research aim guiding the scoping review was to identify knowledge gaps related to attitudes and behaviors of healthcare professionals and MC. Particularly, what further research is needed to effectively implement MC in healthcare?

The questions used for analysis were as follows:

1. What domains of the TDF were used to inform determinants of behaviors in the studies?
2. Do the relevant studies investigate reasons for attitudes?
3. How is professional practice analyzed and understood in the studies?

Method

Scoping reviews are a useful tool to determine the body of literature on a particular topic, the focus of the studies available, and the ways in which the research has been undertaken. These reviews can be beneficial if evidence is still emerging in the area and if knowledge gaps need to be identified for further research (Munn et al., 2018). Given that MC is a relatively new area for public policy, patients, and medical professionals, a broad approach was taken to encompass multidisciplinary and methodologically diverse research.

The five-step framework for scoping reviews was used in the current scope: (a) identify the research question, (b) search and retrieve studies, (c) select studies, (d) extract and table the study data, and (e) collate and summarize the results (Arksey & O'Malley, 2005). Scoping reviews require a rigorous approach and often include a protocol with systematic searching and thoroughly documented methods. The methodology of the current scoping review, outlined below, ensured maximum methodological rigor in line with a systematic review.

Selection of Studies

This research used six electronic bibliographic databases and adhered to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Empirical (qualitative, quantitative, and mixed) methods were identified from the following databases MEDLINE, PsycARTICLES, PsychINFO Web of Science, Scopus, and Google Scholar (see Appendix B for search strings).

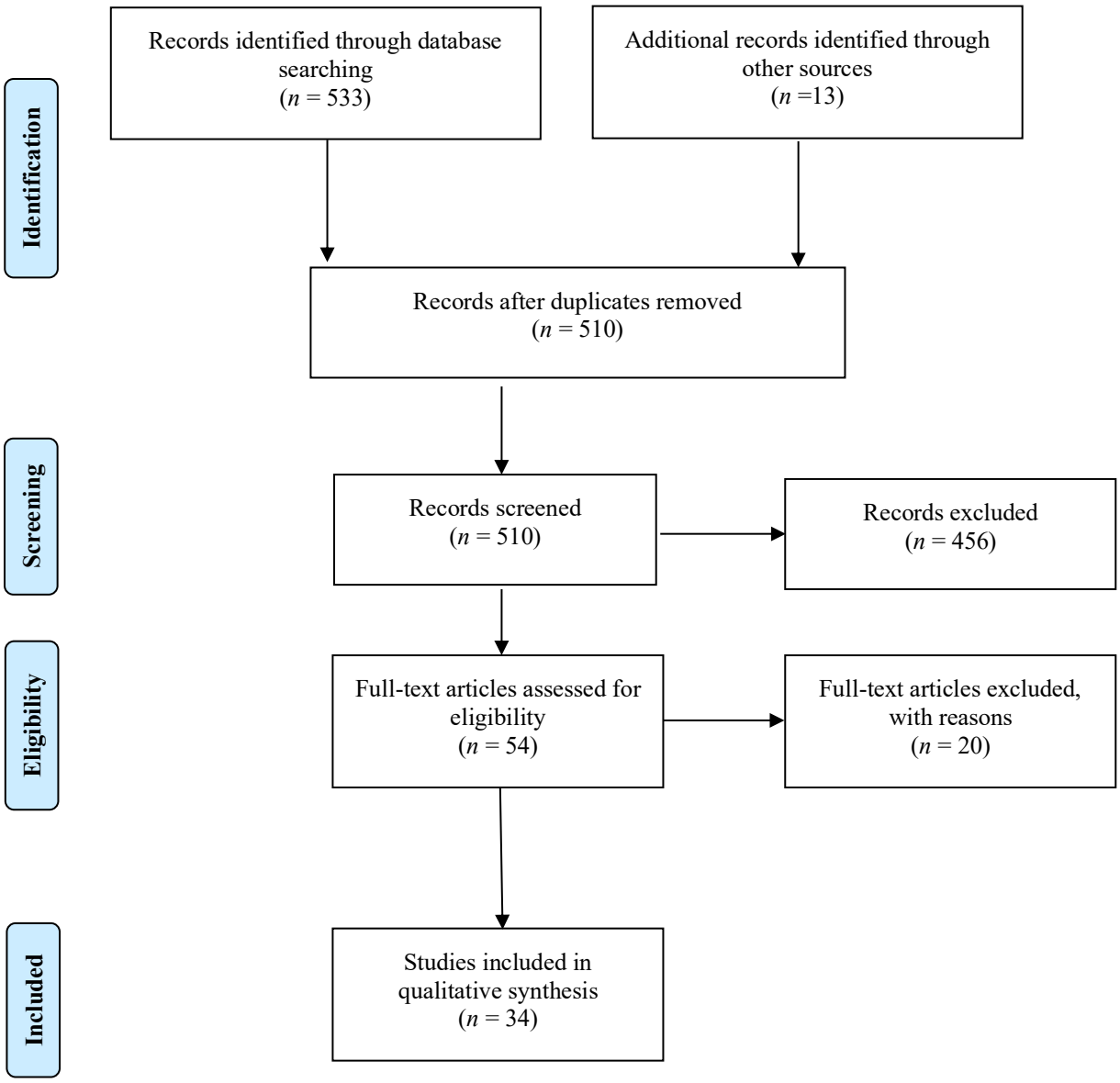
Policy changes related to cannabis and MC legalization commenced in 2001 when cannabis was decriminalized in Luxembourg. Since then, other countries have followed. We therefore searched for all published studies between 2000 and May 2019 using Cannabis Based Medicine OR Cannabis AND attitudes, OR Knowledge, OR Identity. Following the Cochrane Collaboration guidelines (Armstrong et al., 2011), the initial search results were merged, and duplicates were removed. Article titles and abstracts were reviewed, and studies were included if they addressed medical professionals' attitudes, knowledge, behaviors, and practices concerning cannabis or MC. Studies were excluded that related to medical professionals' attitudes toward patients that used cannabis recreationally or were related to recreational use more broadly.

Results

The search strategy generated 545 references. From these references, 54 potentially relevant abstracts were identified. Following a review of the full-text articles, 34 articles remained. See Figure 3 for the selection and exclusion process of included articles.

Figure 3

PRISMA 2009 Flow Diagram



Article Characteristics

The reviewed articles included peer-reviewed, qualitative, and quantitative research methods. The characteristics of each article are detailed in Table 2.

Table 2

Characteristics of Selected Studies

Study #	Authors	Country	Aims of Research	Methods	MC Legal	Sample
1	Ablin et al. (2016)	Israel	To examine the attitudes of Israeli Rheumatologists toward MC use in Rheumatic Disorders.	Cross-Sectional Survey	Yes	23
2	Ananth et al. (2018)	USA	To investigate interdisciplinary provider perspectives on legal MC use in children with cancer.	Cross-Sectional Survey	Not in all locations	288
3	Balneaves et al. (2018)	Canada	To assess the knowledge and practice gaps of Nurse Practitioners related to MC in order to develop appropriate educational strategies.	Cross-Sectional Survey	Yes	182
4	Bascombe et al. (2016)	USA	To explore knowledge, beliefs, and clinic-based practices regarding traditional and alternative tobacco products, including cannabis, among Georgia primary healthcare providers.	Qualitative Study, Interviews	Not in this state	20
5	Bega et al. (2017)	Global	To gather data on the cannabis-related prescribing practices and views of experts caring for patients with Parkinson's disease.	Cross-Sectional Survey	Not in all locations	56
6	Braun et al. (2018)	USA	To examine Oncologists' beliefs, knowledge, and practices regarding MC.	Cross-Sectional Survey	Not in all locations	237
7	Brooks et al. (2017)	USA	To examine healthcare providers' legal knowledge of cannabis and the health implications, practice behaviors, and attitudes toward MC.	Venue-Daytime Survey	Yes	114
8	Caligiuri et al. (2018)	USA	To assess pharmacy student attitudes of curricular related to MC and their confidence in their knowledge of qualifying conditions for its use in the USA.	Cross-Sectional Survey	Yes	238
9	Carlini et al. (2017)	USA	To assess providers' MC knowledge, beliefs, clinical practices, and training needs.	Cross-Sectional Survey	Yes	494
10	Charuvastra et al. (2005)	USA	To obtain opinions about the legal prescription of cannabis as a medical therapy across a cross disciplinary sample of physicians.	Cross-Sectional Survey	No	960
11	Costantino et al. (2019)	USA	To determine participants, comfort with MC use in hospices, discover the processes and logistics in place in these programs and examine what, if any, education is being provided.	Cross-Sectional Survey	Not in all locations	310

Study #	Authors	Country	Aims of Research	Methods	MC Legal	Sample
12	Crowley et al. (2017)	Ireland	To investigate Irish general practitioner attitudes toward decriminalization and levels of support for use of MC.	Cross-Sectional Survey	No	565
13	Ebert et al. (2015)	Israel	To examine, experiences, knowledge, and attitudes of Israeli physicians toward MC.	Cross-Sectional Survey	Yes	72
14	Fitzcharles et al. (2014)	Canada	To examine the confidence of Canadian rheumatologists in their knowledge of cannabinoids.	Cross-Sectional Survey	Yes	128
15	Hwang et al. (2016)	USA	To assess Minnesota pharmacists' preparedness for the state's MC program and their concerns and perceptions of their practice impacts. Ways to reduce knowledge gaps were also identified.	Cross-Sectional Survey	Yes	738
16	Irvine (2006)	Australia	To establish knowledge and attitudes of New South Wales Northern Rivers general practitioners toward MC.	Cross-Sectional Interviews	No	32
17	Jacobs et al. (2019)	Australia	This assess Australian psychiatrists' and psychiatry trainees' knowledge and attitudes related to MC.	Online Survey	Yes	88
18	Karanges et al. (2018)	Australia	To examine the knowledge, attitudes, and willingness to prescribe MC of Australian general practitioners.	Cross-Sectional Survey	Yes	640
19	Kondrad & Reid (2013)	USA	To gather information from family physicians in Colorado regarding attitudes, experience, and practice with MC.	Cross-Sectional Survey	Yes	520
20	Luba et al. (2018)	USA	To examine the attitudes, beliefs, and practices of palliative care providers in the use of cannabis for terminally ill patients.	Cross-Sectional Survey	Not in all locations	426
21	Mendoza & McPherson (2018)	USA	To determine changes in knowledge, self-perceived skills, and attitudes of multidisciplinary hospice providers regarding the use of MC in hospice post an online educational intervention.	Online Survey	Yes	94
22	Mitchell et al. (2016)	Canada	To determine the opinions of hospital pharmacists in Canada toward MC and to assess the factors influencing their opinions.	Cross-Sectional Survey	Yes	67
23	Moeller & Woods (2015)	USA	To study pharmacy students' knowledge of and attitudes toward MC in order to determine if additional education was required.	Cross-Sectional Survey	Yes	311
24	Paut Kusturica et al. (2019)	Serbia	To determine the frequency of recreational cannabis use among medical students and to examine MC therapeutic knowledge and attitudes toward legalization.	Cross-Sectional Survey	No	316

Study #	Authors	Country	Aims of Research	Methods	MC Legal	Sample
25	Philpot et al. (2019)	USA	To obtain information about provider characteristics, attitudes, beliefs, and practices with MC.	Cross-Sectional Survey	Yes	62
26	Sharon et al. (2018)	Israel	To examine the personal experiences, attitudes, and practice of pain management specialists in Israel regarding MC as a treatment for chronic pain.	Cross-Sectional Survey	Yes	50
27	Sideris et al. (2018)	USA	To gather practicing New York physicians' comfort level, opinions, and experience in relation to recommending MC.	Cross-Sectional Survey	Yes	164
28	Stojanović et al. (2018)	Serbia	To assess pharmacy students' knowledge of and attitudes toward MC use in Serbia and to identify if further education is required.	Cross-Sectional Survey	No	80
29	Szyliowicz & Hilsenrath (2019)	USA	To gather insights into the knowledge and attitudes of pharmacists regarding MC.	Cross-Sectional Survey	Yes	474
30	Uritsky et al. (2011)	USA	To assess the knowledge, experience, and views of hospice professionals regarding MC use with terminally ill patients	Cross-Sectional Survey	Not all locations	194
31	Vujcic et al. (2017)	Serbia	To determine medical students' attitudes toward MC legalization and the factors influencing their attitudes.	Cross-Sectional Survey	No	418
32	Ziemianski et al. (2015)	Canada	To determine the educational needs of Canadian physicians regarding MC based on knowledge, experiences, barriers, attitudes, and preferred educational approaches.	Cross-Sectional Survey	Yes	426
33	Zolotov et al. (2018)	Israel	To gain a deeper understanding of physicians' views on MC and its possible integration into their clinics, as well as to identify potential underlying factors that influence these perceptions.	Semi-structured interviews	Yes	24
34	Zullino et al. (2008)	Switzerland	To assess the beliefs of Swiss psychiatrists about the risks associated with cannabis and their prohibitive attitudes toward their patients	Cross-Sectional Survey	No	83

Quality Evaluation of Studies

We used the mixed method appraisal tool (MMAT) to guide our evaluation of the studies selected in the scoping review (Hong et al., 2018). The MMAT is designed for the assessment stage of systematic mixed studies reviews (i.e., reviews that include qualitative, quantitative, and mixed methods studies). Based on the selected studies, two of the five available study categories of the tool were used: qualitative research and quantitative descriptive methods. Each study was evaluated against the 5-point criteria for each category. The qualitative research was assessed against the following questions.

- Is the qualitative approach appropriate to answer the research question?
- Are the qualitative data collection methods adequate to address the research question?
- Are the findings adequately derived from the data?
- Is the interpretation of results sufficiently substantiated by data?
- Is there coherence between qualitative data sources, collection, analysis, and interpretation?

The quantitative questions were evaluated against these questions.

- Is the sampling strategy relevant to address the research question?
- Is the sample representative of the target population?
- Are the measurements appropriate?
- Is the risk of nonresponse bias low?
- Is the statistical analysis appropriate to answer the research question?

Thirty-one studies were quantitative, and three used qualitative methods. In the studies selected, recruitment of participants was done primarily through membership organizations or specialization groups of medical professionals. See Table 3 for the evaluation results.

Table 3

Evaluation Results

Study #	Citation	MMAT Result
6	Braun et al., 2018	5
8	Caligiuri, Ulrich, & Welter, 2018	5
20	Luba, Earleywine, Farmer, & Slavin, 2018	5
24	Paut Kusturica, Tomas, Sabo, Tomić, & Horvat, 2019	5
4	Bascombe et al., 2016	5
33	Zolotov, Vulfsons, Zarhin, & Sznitman, 2018	5
7	Brooks, Gundersen, Flynn, Brooks-Russell, & Bull, 2017	4
22	Mitchell, Gould, LeBlanc, & Manuel, 2016	4
16	Irvine, 2006	4
19	Kondrad & Reid, 2013	4
21	Mendoza & McPherson, 2018	3
23	Moeller & Woods, 2015	3
26	Sharon, Goldway, Goor-Aryeh, Eisenberg, & Brill, 2018	3
28	Stojanovic et al., 2018	3
31	Vujcic et al., 2017	3
34	Zullino et al., 2008	3
2	Ananth et al., 2018	3
3	Balneaves, Alraja, Ziemianski, McCuaig, & Ware, 2018	3
5	Bega, Simuni, Okun, Chen, & Schmidt, 2017	3
12	Crowley, Collins, Delargy, Laird, & Van Hout, 2017	3
13	Ebert et al., 2015	3
14	Fitzcharles et al., 2014	3
15	Hwang, Arneson, & St Peter, 2016	3
17	Jacobs, Montebello, Monds, & Lintzeris, 2019	3
18	Karanges, Suraev, Elias, Manocha, & McGregor, 2018	3
25	Philpot, Ebbert, & Hurt, 2019	3
27	Sideris et al., 2018	3
29	Szyliowicz & Hilsenrath, 2019	3
30	Uritsky, McPherson, & Pradel, 2011	3
32	Ziemianski et al., 2015	3
1	Ablin, Elkayam, & Fitzcharles, 2016	3
9	Carlini, Garrett, & Carter, 2017	3
10	Charuvastra, Friedmann, & Stein, 2005	3
11	Costantino, Felten, Todd, Maxwell, & McPherson, 2019	3

Participant and Sample Characteristics

The final 34 studies accepted in the scoping review represent a total of 7,349 participants. Sample sizes range from 20 to 960. Most samples, 51% (n = 17), were U.S. based. Four were from Canada and Israel, three were from Serbia and Australia, and the remaining samples were either global or from one specific country. There were two main types of studies undertaken: the first focused on those professionals that prescribed or were legally able to prescribe MC, and the second addressed those that did not use MC because they were students or in locations where it was not legally allowed. Six samples involved pharmacy or medical students. Five studies sampled medical professionals not using cannabis due to its legal status in their practice's location. Twenty-four studies included samples of professionals legally allowed to practice with cannabis.

The studies undertaken in the United States represented samples from states in which MC was both illegal and legal at the time. Three national studies had samples from both legal positions and represented 12% of U.S. participants. From those three national studies, 8.3% of the participants were from MC-legal states. Three samples were from states in which MC was illegal and represented 17% of U.S. participants. The four Canadian samples were undertaken when MC was legal and represented 19% of participants. In addition, MC was legal when the Israel studies were completed and represented 1.2% of total participants. Studies undertaken in Australia were conducted when MC was both illegal and legal. Serbia, Ireland, and Switzerland studies were conducted when MC was illegal in those countries (20%). One global study only differentiated legal status of states in the United States and not in the other countries surveyed. There were no multi-country studies undertaken in Europe.

Professional Groups

Numerous professional groups were represented in the samples. Eight studies focused on the following specific areas of healthcare: hospice, palliative care, oncology, primary care, and pain management. These studies included multidisciplinary professional groups that worked in these areas. The remaining studies focused on a single professional group working or studying in healthcare (see Table 4).

Table 4

Professional Groups Identified in Selected Studies

Country	Professional Group	Number
USA		
	Administrators	44
	Nurse Practitioners & Physician Assistants	47
	Social Workers	55
	Physicians – Naturopathic	73
	Nurses – Advanced Practice	160
	Other – Assistants, Nutritionists, Counsellors	178
	Physicians – Oncologists	237
	Physicians – Family	520
	Pharmacist Students	549
	Nurses	707
	Pharmacists	1339
	Physicians	1726
Israel		
	Physicians - Rehabilitation	6
	Physicians - Family	9
	Physicians - Neurology	13
	Physicians - Psychiatry	20
	Physicians - Rheumatologists	23
	Physicians - Oncology	37
	Physicians - Pain Specialists	61
Ireland		
	Physicians - General Practitioners	565
Canada		
	Physicians Rheumatologists	128
	Nurse Practitioners	182
	Physicians	426
	Hospital Pharmacists	767
Australia		
	Physicians - Psychiatrists and Psychiatry Students	88
	Physicians - General Practitioners	672
Serbia		
	Medical Students	734
	Pharmacist Students	80
Switzerland		
	Physicians - Psychiatrists	83
Global	Physicians - Neurologists	56

Note. Some studies did not report all professional groups as participants did not always categorize themselves.

Summary of Domains Used in the Studies

The TDF (Cane et al., 2012) was used to guide investigation of the studies selected in the scoping review. For each domain of the TDF, we agreed indicative themes that were relevant to MC and cannabis. The "knowledge" domain was present in all the selected studies' findings. The second most frequent occurring domain was "beliefs and consequences," and the third was "environmental context and resources." A summary of the domains and indicative MC themes analyzed in the studies can be found in Table 5.

Table 5

Domains and Related Themes Identified in the Studies

Theoretical Domains Identified in Studies	# of times present
KNOWLEDGE – D1 (an awareness of the existence of something) • Legislative understanding of laws related to both recreational cannabis and MC • How to access MC in the country or state • Qualifying health conditions for use of MC • Prescriptions or dosing with MC • Negative or contraindications impacting mental and physical health.	34
SKILLS – D2 (an ability or proficiency acquired through practice) • Prescribing • Experience of use of MC with other drugs • Prescribing through experience for specific symptoms	9
SOCIAL PROFESSIONAL ROLE AND IDENTITY – D3 (a coherent set of behaviors and displayed personal qualities of an individual in a social or work setting) • Professional identity as a healthcare profession	1
BELIEFS ABOUT CAPABILITIES – D4 (acceptance of the truth, reality, or validity about an ability, or talent that a person can put to constructive use) • Self confidence in relation to cannabis	1
BELIEFS ABOUT CONSEQUENCES – D6 (acceptance of the truth, reality, or validity about outcomes of a behavior in a given situation) • Beliefs about the consequences of cannabis legalization • Attitudes about cannabis positive and negative impacts • Beliefs about patient motivations with MC • Beliefs about legalization of recreational cannabis	21
INTENTIONS - D8 (a conscious decision to perform a behavior or a resolve to act in a certain way) • Reporting of patient use of cannabis	2
ENVIRONMENTAL CONTEXT & RESOURCES – D11 (any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adoptive behavior) • Guidelines available from professional bodies regarding MC • Organizational policies related to MC • Educational institutions with MC in the curriculum • Legal status of MC	12
SOCIAL INFLUENCES - D12 (those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviors) • Patient expectations and advocacy	7

Theoretical Domains Framework Analysis

The following section provides an overview of the domains of the TDF that were most prevalent in the selected studies. The coding of the papers by domain is outlined in Table 6.

Table 6

Analysis of Studies Using the TDF

Source	Knowledge	Skills	Social professional role and identity	Beliefs about capabilities	Beliefs about consequences	Intentions	Environmental context and resources	Social influences
Ablin et al. (2016)	X				X			
Ananth et al. (2018)	X	X				X	X	
Balneaves et al. (2018)	X				X		X	
Bascombe et al. (2016)	X				X			X
Bega et al. (2017)	X						X	
Braun et al. (2018)	X				X			X
Brooks et al. (2017)	X	X			X			
Caligiuri et al. (2018)	X			X				
Carlini et al. (2017)	X				X			
Charuvastra et al. (2005)	X				X			
Costantino et al. (2019)	X	X						
Crowley et al. (2017)	X				X			
Ebert et al. (2015)	X				X			X
Fitzcharles et al. (2014)	X				X			
Hwang et al. (2016)	X				X			
Irvine (2006)	X				X	X		
Jacobs et al. (2019)	X				X			
Karanges et al. (2018)	X				X			
Kondrad & Reid (2013)	X				X			
Luba et al. (2018)	X	X						X
Mendoza & McPherson (2018)	X	X					X	X
Mitchell et al. (2016)	X	X						
Moeller & Woods (2015)	X						X	
Paut Kusturica et al. (2019)	X				X		X	
Philpot et al. (2019)	X						X	

Source	Knowledge	Skills	Social professional role and identity	Beliefs about capabilities	Beliefs about consequences	Intentions	Environmental context and resources	Social influences
Sharon et al. (2018)	X	X					X	X
Sideris et al. (2018)	X							
Stojanović et al. (2018)	X							
Szyliowicz & Hilsenrath (2019)	X				X		X	
Uritsky et al. (2011)	X	X			X		X	X
Vujcic et al. (2017)	X				X		X	
Ziemianski et al. (2015)	X				X		X	
Zolotov et al. (2018)	X	X	X					
Zullino et al. (2008)	X				X			
TOTAL	*34*	*9*	*1*	*1*	*21*	*0*	*12*	*7*

The results were analyzed in a number of steps guided by the study aims. The first being an examination of the domains that were used from the TDF to inform determinants of behaviors in the studies (see Table 6). The second was examining attitudes and how they were used in analysis or study design. The third was how professional practice was analyzed and understood in the studies.

Knowledge

In the TDF, the *knowledge* domain refers to an awareness of the existence of something. This factor is important because a person's perceived awareness of the scientific rationale, procedures, and task environment associated with a desired behavior is likely to affect whether a person decides to implement that behavior. Across all 34 studies, knowledge was examined in some form. The scope of knowledge included legislative understanding of laws related to both recreational cannabis and MC; how to access MC in the country or state; qualifying health conditions for use of cannabis; prescriptions or dosing with MC; and negative or contraindications impacting mental and physical health. Through the studies, participants were either asked to rate their own knowledge or asked specific questions that assessed their knowledge. Many studies pointed to participants' need and requests for ongoing education related to MC. Most physicians reported learning about MC from the news, other physicians, and patients rather than from a formal educational setting, such as continuing medical education. The time lag between evidence-based clinical trials and updated information by central bodies was perceived as an inhibitor to knowledge and learning. This lack of empirical evidence to inform clinical practice was cited in most studies concerning knowledge.

Lack of knowledge and training was perceived as a barrier to recommending cannabis in most studies. Four studies were undertaken in Canada, where patients have had access to cannabis for therapeutic purposes under Health Canada's Medical Marijuana Access Program since 1999. One of these studies showed that 64% of the physicians felt that lack of clinical guidelines was a barrier to implementation (Ziemianski et al., 2015), while 87.4% of Canadian nurse practitioners stated the key barrier was a lack of personal knowledge, education or information, and 70.3% noted the lack of clinical guidelines (Balneaves et al., 2018). A pharmacists study indicated that 70% of the participants had engaged in their own self-directed learning related to cannabis, and only 17.2% agreed they were knowledgeable in its medical purpose. The key reasons given across all studies regarding results related to knowledge were

lack of formal training; the topic not being covered in the discipline curriculum; or lack of centralized body updates, support, and ongoing professional education.

Fifteen (44%) studies measured knowledge related to legislative and access processes for obtaining MC. These studies included questions related to national and state laws for recreational and MC use, qualifying conditions approved for prescription, or MC use and methods of patient access in the geographic locations. Of these studies, the range of responses was between 5% to 65% of adequate knowledge through self-reported or assessment questions.

Four studies (11%) focused on accuracy of knowledge for prescriptions and dosing of patients. These studies indicated participants' desire for further education or the positive impact of cannabis-based education interventions. Knowledge of qualifying conditions, health benefits, and contraindications of participants was undertaken across 19 (55%) studies. There was a lack of consistency across most of these studies regarding the agreed uses of MC and the risks, both through self-reporting and assessed factors. The remaining 11 (32%) studies focused on specialized healthcare groups (e.g., rheumatology, oncology, palliative care, neurology [Parkinson's disease]), or pain management. In these specialties, MC was known to be prescribed or was considered appropriate for treatment. These studies suggested a clear lack of knowledge and misconceptions related to the addictive and contraindication dimensions of MC.

Two of these specialist studies focused on rheumatologists from Israel (Ablin et al., 2016) and the United States (Fitzcharles et al., 2014). While 74% of the Israeli respondents believed there was some role for cannabinoids in the management of rheumatic disease, three-quarters were not confident about their knowledge and ability to write a prescription. Arthritis pain was reported as one of the most common reasons for people to use medical herbal cannabis in North America. Over three-quarters of the U.S. respondents lacked confidence in their knowledge of cannabinoid molecules and stated uncertainty about prescribing practices.

Beliefs about Consequences

In the TDF, the *beliefs about consequences* domain refers to an acceptance of the truth, reality, or validity about the outcomes of a behavior in a given situation. The beliefs a person holds about the outcomes of a particular behavior will affect whether they decide to comply. Twenty-one studies offered data or commentary related to beliefs about cannabis and patient outcomes. A predominant belief was that patients may try to access MC for recreational use. An Australian study of general practitioners found, in the open-ended comments, themes of

concern about misuse, abuse, and dependence (Karanges et al., 2018). Generally, in the studies with participants who had used cannabis themselves, respondents showed less concern about the consequences of cannabis. Thus, beliefs about outcomes were often linked to participants' lack of perceived or actual knowledge. For example, an Australian study of psychiatrists found that participants were correct on 4.73 of 11 items (*SD* = 2.24, range: 1-9) for cannabidiol and correct on 5.64 of 11 items (*SD* = 1.53, range: 2-9) for THC with concerns that MC could lead to psychotic symptoms, apathy, addiction, and misuse (Jacobs et al., 2019). More positive beliefs about consequences were evident in studies in which participants were dealing with cancer and end-of-life patients. One study of hospice health professionals found that more than 75% of respondents would "turn a blind eye" if they found their patient was achieving symptom control by smoking cannabis (Uritsky et al., 2011).

Environmental Context and Resources

In the TDF, the *environmental context and resources* domain refers to circumstances of a person's situation or environment that discourage or encourage the development of skills and abilities, independence, social competence, and adaptive behavior. In other words, the nature of the environment in which a person is required to perform a specific behavior is likely to affect whether a person is able or willing to perform that behavior. Ten studies examined findings from this domain. The predominant barriers to cannabis implementation were a lack of centralized legal status, a lack of centralized professional body recommendations, and a lack of organizational policy and clinical guidelines. For example, in one study of pharmacists in California, 75% of participants felt they would be more comfortable discussing cannabis with patients if it was approved by the FDA. In a New York study, 71% of physicians agreed that MC should be an option available to patients. However, most participants were not registered to certify its use. Common reasons for not registering included being a specialty and the federal status of cannabis (Sideris et al., 2018).

Skills

According to the TDF, the *skills* domain refers to an ability or proficiency acquired through practice. Skills are important determinants of behavior change because people's perceived sense of their own competence in performing a desired behavior is likely to affect whether they are willing and able to implement that behavior. The provision and quality of training for skill development, opportunities to practice, and opportunities to gain an

understanding of an existing skill set through assessment are also likely to influence performance of the desired behavior. Nine studies examined participants' skills. One study distributed a pre- and post-survey of a general training module related to cannabis. Results were significantly increased after the educational intervention, with providers reporting greater self-perceived skills, above 75% (Mendoza & McPherson, 2018). Skills obtained through experience emerged in a study of pain specialists in Israel. As a result of prescribing and working with cannabis, 45% of Israeli pain specialists stated that they themselves would prefer to be treated with cannabis rather than opiates for chronic pain (Sharon et al., 2018).

Social Influences

The domain of *social influences* (those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviors), appeared in seven studies. Oncologists, hospice workers, and those practicing in palliative care had positive views toward the use of MC, particularly for managing symptoms at the end of life. These social influences were generally explained as the challenge to these groups of dealing with patient expectations and difficult symptoms near the end or life or when opioid treatments had been exhausted (Ananth et al. 2018). One study undertaken with medical oncologists in the United States identified an anomaly between the participants' self-reported knowledge base and their practices regarding MC (Braun et al. 2018). Results showed that although 70% of oncologists did not feel equipped to make clinical recommendations regarding MC, the majority conducted patient discussions about MC, and almost half recommended it clinically.

Attitudes and Behaviors

The term *attitude* refers to an evaluation of an attitude, object, person, or issue. Attitudes can be explicit (deliberate or conscious) and implicit (automatic, unconscious, or intuitive). Attitudes are often interpreted as being acquired and owned by individuals; however, they are significantly impacted by social processes. Attitudes are also embedded in wider representational and ideological systems attached to social groups and categories (Smith & Terry, 2003). While over half of the studies had "attitude" in their title (see Table 2), there was no clear definition of attitude in the studies or an examination of how attitudes were influenced at individual and group levels. One study used the substance abuse attitude scale, which aimed to measure "permissiveness" and "non moralism" variables. However, the language of the scale implied that cannabis was problematic (Charuvastra et al., 2005).

In the 21 (61%) studies that measured attitudes related to legalization, over 90% of participants did not support legalization for recreational use. However, there was a broad agreement with cannabis being legalized for medical use. Participants were predominately neutral or agreed with responses to MC legalization questions, ranging from 50% to 90% across these studies. In U.S.-based studies, there was support for federal legalization to decrease confusion between state and federal laws and to improve research. Studies with medical or pharmacy student participants highlighted that those who had used cannabis recreationally were more likely than those who had not to minimize the risks associated with MC and to support the legalization. These results echo the beliefs used in cannabis legalization and public policy debates, whereby cannabis is understood to have medical effects and to be addictive, and legalization can lead to increased recreational use (Sagy et al., 2018).

The formation of positive and negative attitudes toward MC was ascribed to geographic location, legal status, and MC subsequently being a politicized health issue in three studies undertaken in the United States. However, there were more subtle aspects of the factors influencing attitudes. For example, a study of physicians in Colorado, where MC has been legalized since 2009, found that only 19% of the sample agreed that physicians should recommend MC, and "physicians surveyed agreed that there were significant physical (61%) and mental (64%) health risks with marijuana use" (Kondrad & Reid, 2013, p. 55). This study suggested that these attitudes reflect views related to disgruntlement with the dispensary system and a belief that patients used the process for recreational use rather than medical needs.

The Links Between Practice, Knowledge, Attitudes, and Behaviors

One qualitative study undertaken in Israel with 24 physicians practicing in either pain medicine, oncology, or family medicine recognized that identities integral to the role of professional physicians are challenged by MC policies. Further, a paradox is at play for these physicians between complying with biomedical standards and professional norms while simultaneously treating patients to relieve pain and suffering. This contradiction was evident across the majority of the 21 (61%) studies that explored how physicians were using MC in practice, however it was not always named explicitly as part of the results. The elements of physician practice with MC that were examined dealt with patient inquiries for MC, the relationship between knowledge and practice, prescribing or recommending, and preferences for treating self or family members.

The number of patient inquiries regarding MC were investigated in 16 (47%) studies. In most of these studies, patient-initiated discussions about MC were double that of healthcare practitioner-initiated discussions. This lack of physician-initiated conversations was explained as being due to a lack of practitioner's knowledge or not being "comfortable" having discussions with patients. Discomfort was generally rationalized as being influenced by public policy changes occurring rapidly without medical guidelines or evidence-based research in place for practitioners to draw upon. In end-of-life settings, studies showed strong support for MC, up to 90%; however, these results did not match the number of reported recommendations to patients by practitioners in those settings. One study suggested that there may be more openness to using MC for symptoms, such as pain, rather than for specific diseases (Charuvastra et al., 2005).

Despite reported lack of evidence-based medicine and MC, practitioners were also influenced by their direct experience of using the compounds. A pain specialist study in Israel showed that 95% of respondents prescribed MC in their practice. Only 12% rated cannabis as more hazardous than opiates, whereas 43% felt that opiates are more hazardous than cannabis and 45% found them equally hazardous. These results are of interest because, despite these practitioners' high rates of usage, the majority did not believe they were adequately trained in the use of MC (Sharon et al., 2018). Similarly, a study undertaken with medical oncologists in the United States identified an anomaly between the participants' self-reported knowledge base and their practices regarding MC (Braun et al., 2018). Among the 45.9% who reported recommending cannabis clinically in the past year, 56.2% did not consider themselves to have sufficient knowledge to make a recommendation. The majority of a sample of New York physicians, 75%, reported having patients who used cannabis for symptom control but had little familiarity with the state program and only a modest knowledge of the ECS (Sideris et al., 2018).

The specialty and professional group memberships were suggested to influence participants' attitudes. Oncologists, hospice workers, and those practicing in palliative care had positive attitudes toward the use of MC, particularly for managing symptoms for end-of-life care. One interdisciplinary study of practitioners in pediatric oncology found that most providers (92%) were willing to help children with cancer access to MC (Ananth et al., 2018). Another study of oncologists found that those practicing in hospital settings were less likely to prescribe due to lack of administration policies and MC. However, "67% viewed [MC] as a helpful adjunct to standard pain management strategies, and 65% thought [MC] is equally or more effective than standard treatments for anorexia and cachexia" (Braun et al., 2018, p.

1957). These attitudes were explained as these specialty groups representing practitioners dealing with symptoms near the end of life or when opioid treatments had been exhausted.

Reasons for Attitudes and Behaviors

Most studies acknowledged the current situation of MC and medicine as being unique and quite unprecedented in modern healthcare's traditions and norms. At a global level, there are federal or centralized laws, such as those in the United States, Europe, and the UK, that do not recognize cannabis as legal; yet at the state or national levels, MC has been introduced (Yeoh, 2020). This contradictory position results in research agendas limited in the funding, scope, and samples that can be examined to further understand the plant's efficacy in healthcare. This limitation in the regulatory framework means MC has been introduced outside the traditional drug approval process. The evidence-based medicine protocols familiar to practitioners have not been applied with MC, which has resulted in significant lack of knowledge. Centralized bodies and associations have not been able to update members on quality and treatment protocols in time with legislative changes. However, examining the legal status of participants' locations in relation to behaviors had varied results. Some studies inferred legal status as a determinant of behavior, while others tried to measure the impact of legal status on behaviors, with mixed results.

In the West, cannabis was once used in medicine and then became criminalized in the 1930s, contributing to the current challenges with which policy makers, health practitioners, and patients now contend. There is an echo of stigma (Roberts, 2018; Schlag et al., 2020) associated with cannabis being viewed as a drug while simultaneously holding great promise in the relatively recent discovery of its positive impact on the human ECS. This mixed level of knowledge, resulting from the policy environments, was often suggested in the studies to negatively influence practitioners' confidence in recommending MC or increased their attitudes and concerns related to risks (Abrams, 2018).

There were other influences on attitudes related to MC, particularly in relation to specific professional groups. Practitioners working in oncology or with end-of-life patients were more open to prescribing MC to relieve pain or suffering. The professional groups involved in these areas reported a belief that MC could be beneficial to patients. Pain management specialists also stated more openness to using MC, whereas the rheumatologists were not as open and felt there was not enough evidence pointing to MC's efficacy. These differences across professional groups indicate that the biomedical model heavily influences

practitioner attitudes; however, experience and other tacit factors also influence the interplay and development of medical knowledge and practices (Upshur, 2002). This experience-based development was highlighted in the studies in which practitioners used MC in treatments, experienced its impact, and yet reported not having adequate training or knowledge of its efficacy.

Discussion

This scoping review sought to examine the determinants of behaviors used as per the TDF in both the research design and findings of the selected studies related to healthcare professionals and MC. The first section provides an overview of the TDF domains utilized or not in the studies overall, and the second section provides a discussion of the implications for further research.

The Theoretical Domains Framework

The TDF is comprised of 14 domains intended to be used to guide research and implementation reviews during practice changes in healthcare. During the scoping review, eight domains were identified in the studies, and these were generally not made explicit in the study designs or analysis of results. Overall, the studies aimed to examine knowledge, attitudes, and beliefs of various groups in healthcare related to cannabis. There were many differences in the ways that this was done; however, a similarity was that behavioral theoretical approaches were not outlined in terms of establishing the research questions or in analyzing the findings.

Further, the behavioral concepts that occur in six domains of the TDF were not identified as present in the studies – two examples being goals (mental representations of outcomes or end states that an individual wants to achieve) and optimism (the confidence that things will happen for the best or that desired goals will be attained). Overarchingly, use of the TDF in analyzing the studies selected in the review provided a consistent guide for examining the behavioral aspects that were included or not in the studies and whether this was clearly stated in the aims or findings of the research.

Professional Group Influences

Given the various professional groups identified in the studies with their corresponding geographical and speciality differences, it was notable that attention was not given to the influence of professional identities on participants in the studies. Behaviours and attitudes

were generally viewed as individual responses to the MC context, with the analysis suggesting that people made sense of their situations based on MC legislation, workplace policies or practices developed with patients. Although there is a substantial body of research that has examined the impact of professional identity influences on group norms in healthcare (Johnson & May, 2015; Walsh et al., 2018), a lack of focus on the social influences such as group and professional identities was present. This confirmed findings related to the common-sense approach to behavior being implicit and predominant in studies related to healthcare groups and cannabis (Gardiner et al., 2019). It also points to the critical contribution of research and practice in better understanding the enablers and barriers, beyond individual behaviors, to the introduction of changes in healthcare and appropriate interventions to support implementation.

Limitations

Overall, the majority of studies used cross-sectional survey methods and therefore were limited in their ability to examine why people held their beliefs and reported certain behaviors, for example, the belief that patients would try to access cannabis recreationally through MC processes. Other research methods, such as focus groups, would allow some of these results to be explored in more depth. The claim that the legal status of cannabis was a key driver of behaviors, for example, restricted the examination of other factors that may have been impacting implementation of MC.

In addition, the TDF does not provide intersectional links or drivers between the domains, which could be a limitation in analyzing the data related to findings. For example, knowledge was reviewed across all studies; however, it was unclear if this was viewed as a driver of behaviors and if so, to what extent.

Recommendations for Future Research

While the studies incorporated some theory in relation to MC, the questions that were asked, as well as the explanatory factors investigated regarding attitudes and behaviors, were not sufficiently theorized. Studies that examine the multiple factors that underpin the behaviors of healthcare professionals related to policy shifts and healthcare changes such as MC would provide a more comprehensive evidence base to support implementation interventions. As per the TDF, these factors require being broader than knowledge. They need to include environmental, professional, and social influences on healthcare professionals and the intersection of these variables.

Conclusion

Policies are continuing to evolve globally in relation to cannabis, and patients are increasingly requesting information from their healthcare providers. Healthcare professionals need support to integrate MC knowledge, attitudes, and practice in a largely uncharted emerging area of medicine. This scoping review points to a need for improvements in education and clinical guidance to assist in the integration of cannabis into medical practice. However, examining broader determinants of behavior demonstrates that other domains need to be considered to ensure effective implementation. The underlying societal and professional norms and the influences of the environments that healthcare professionals inhabit must also be understood to expose the enablers of more fully and barriers to implementation. These findings could then be used to shape education that does not just focus on knowledge but also attends to the unique aspects of professional groups in relation to their professional identities and emerging practices, beliefs, and behaviors. Use of the TDF to ensure appropriate domains are addressed in educative and research interventions would support this aim.

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Chapter 4

UK Healthcare Professionals and Cannabis: The Influence of Professional Identities on Attitudes and Norms

This chapter is based on the paper

O'Rourke, R., Lima, M. L., & Camino C. **(**2021). *UK healthcare professionals and cannabis: The influence of professional identities on attitudes and norms* [Manuscript submitted for publication]. CIS-IUL Department, Lisbon University Institute.

Abstract

Medical cannabis represents a significant change for healthcare professionals in the UK. Many professionals find themselves navigating the new legislation and increased public pressure for access to the medicine. There has been a limited number of prescriptions for cannabis in the UK since legalization in late 2018. This unique study aims to examine the influence of professional identities on attitudes and norms of healthcare professionals concerning recommending cannabis to patients in the UK. A sample of 150 healthcare professionals across various healthcare disciplines participated in the online survey. We found that a stronger identification with professional groups influenced the perceived norms of healthcare professionals toward recommending cannabis. This offers an opportunity for tailored, group-based educative interventions to support the implementation of medical cannabis.

The current paper is an exploration of the influence that social identities have on the attitudes and norms of UK healthcare professionals in relation to medical cannabis. In November 2018, in the UK, medical cannabis was legalized and made available under a Medicines and Healthcare products Regulatory Agency specials license. This legislative change was largely driven by public pressure and campaigns for access to use (Hurley, 2018). However, rescheduling means that herbal cannabis and cannabis oil preparations that have not gone through this formal licensing process can now also potentially be prescribed as medicines. As a result, healthcare professionals are now in a position that contravenes the typical evidence-based medicine approvals. This lack of evidence basis, combined with the controversy surrounding medical cannabis, can place healthcare professionals in an uncomfortable position. Meanwhile, only 10 prescriptions for medical cannabis have been written in the UK, for a small number of patients, within a limited range of conditions since the introduction of the new regulations (Schlag, 2020).

While public pressure for access to this medicine continues to increase, the change in policy requires that the barriers and enablers toward implementation of medical cannabis in healthcare is examined (Hawkes, 2018). Typically, evidence-based medicine suggests that equipping people with knowledge facilitates change in practices and that with scientific evidence or central approvals in place, healthcare professionals will be comfortable to recommend medical cannabis (Iacobucci, 2018). However, in a relatively short time, a "drug" has become a "medicine" and has challenged the norms of various groups in society, particularly those in healthcare. This significant change of view and use of this controversial medicine requires that barriers and enablers beyond knowledge to be examined. Professional identity, defined as an individual's professional self-concept based on beliefs, attributes, values, and experiences, is a type of social identity. Determining if social influences such as professional identities inform attitudes and norms of healthcare professionals, in relation to practice, can provide direction related to the types of educational interventions offered that better support healthcare professionals and ensure effective implementation.

Literature Review

The Social Identity Approach

Social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987) comprise the social identity approach. The social identity approach explains the interplay between individuals and social influences that produce outcomes such as attitudes

and group norms. Self-categorization theory suggests that in order for group membership to impact individuals, the group should generally be perceived as meaningful and relevant to the self and, more specifically, be psychologically internalized categories that provide a basis for the person to understand their place in the world (Turner et al., 1987). According to social identity theory, people also develop aspects of their self-concept and sense of self-esteem from group memberships. This is likely to occur when group members share an important characteristic, for example, interests and skills. Therefore, the way in which people see themselves is determined by the groups to which they belong – their social identity (Tajfel & Turner, 1979). When social identities become salient, cognitive, evaluative, and behavioral outcomes can occur.

Social Identities and Well-Being

The social identity approach to health (S. A. Haslam et al., 2009; Jetten et al., 2012) outlines the influence of self-categorization and social identification of social groups as critical to health and well-being. This is largely due to group membership influencing feelings related to social support. Therefore, identification with a group and the subsequent feelings related to the social support given and received is a key factor that impacts people's health. There is abundant evidence of the indirect effect of social identification through received social support on health and well-being across groups, organizations, leisure, and other non-work group contexts (Avanzi et al., 2015; Cruwys et al., 2013; Cruwys et al., 2014; C. Haslam et al., 2008; McKimmie et al., 2009). In recent years, a body of research has emerged that is known as the "social cure." This is focused on the evidence that when group memberships provide individuals with meaning, support, and agency (i.e., a positive sense of social identity), health is positively impacted, constituting a social cure (C. Haslam et al., 2018).

Healthcare Professional Identities

Professional identity, defined as an individual's professional self-concept based on beliefs, attributes, values, and experiences, is a type of social identity. Both professional identity and contemporary careers are subject to relational and social influences within and even beyond the individual's present occupation or organization (Arthur, 2008; Hall et al., 2002). When groups have a robust professional identity, work occurs from a similar frame of reference. Members share consistent work norms and have the same interests in mind. Research has demonstrated that this cohesion predicts effective communication patterns with members

of the same group as they make interactions more predictable and efficient (S. A. Haslam et al., 2000). In healthcare, professional identity has also been linked to performance; for example, one study found that nurses with a strong professional identity gave more attention to ensuring their vaccinations were up to date (Falomir-Pichastor et al., 2009). In another study, clinical errors of physicians were perceived as a threat to professional identity (Bellodi, 2004).

In some circumstances, strong professional identities can also have a negative impact. Research has found that changes, such as the introduction of new specialties, new roles or ways of working, technological transformations, and multidisciplinary collaborations in complex patient cases, can cause identity threat to an individual's professional identities (Waring & Bishop, 2011). These threats can result in an over reliance on one's own expertise and negative reactions to those outside the specialty or professional area (Molleman & Rink, 2015).

There are a number of studies that have examined attitudes toward medical cannabis across healthcare professions using professional disciplines and specific health situations, such as end-of-life and chronic pain management, to guide participation and analysis in the research (Gardiner et al., 2019). Many of these studies have pointed to a lack of knowledge as inhibiting professionals in both their attitudes and practice concerning medical cannabis (Mendoza & McPherson, 2018; Mitchell et al., 2016; Moeller & Woods, 2015).

There are also some professional groups that, despite a lack of evidence-based research verification, have been developing their understanding of medical cannabis through their practice and experience. This represents a shift from the traditional evidence-based medicine protocols typically in place in relation to medicines (Ebert et al., 2015; Ryynanen, 2001; Sharon et al., 2018; Uritsky et al., 2011). These professional groups have been predominately influenced by patient needs, particularly in relation to pain and end-of-life symptom management. Therefore, a lack of evidence-based medical knowledge is not the only variable that influences the attitudes and norms of professional healthcare groups.

Prior to this study, a scoping review was undertaken based on the PRISMA guidelines. A key aspect of this review examined whether professional identities were recognized as influencing norms and behaviors in relation to recommending medical cannabis. Investigating the unique aspects of professional healthcare groups in relation to the influence of professional identities was found to be lacking across the studies. Therefore, it appears that the influences of group norms, attitudes, and behaviors have so far not been considered in relation to recommending cannabis (O'Rourke & Lima, 2020).

Attitudes and Norms

The social identity perspective maintains that attitudes are more likely to be expressed as behaviors if the attitudes and related behaviors are normative of a social group that its members identify with. In the social identity approach, emphasis is placed on the role of self-categorization in compliance to group norms (Hogg & Reid, 2006). Individuals that identify more closely with a given social group are more likely to adhere to the group norms, partly to belong and also as a way to guide their behavior (Hogg & Reid, 2006; Hornsey, 2008). Therefore, attitudes are a powerful influence for constructing group stereotypical, or normative, inferences about attitudes and behaviors.

As identification with a group increases, the more relevant its norms become in guiding attitudes and behaviors. In-group norms are considered powerful types of social norms because the desire to be similar to the group can lead to the in-group norms becoming internalized. This can then become part of the self and be validated for self-determined motivations (Sansfaçon & Amiot, 2014). Therefore, the influence of norms is expected to be relatively less dependent on the presence of other group members or environmental triggers; however, it is important to note that a norm primarily directs behavior when it is made contextually salient. Research has also shown that a person's identification with a group is not only based on their personal representation of the group but is also influenced by processes at a group level (Jans et al., 2015; Ozeki, 2015). Therefore, identification is not only an intrapsychic process of each person but also an evolving aspect of the group as a whole.

Previous Study of Irish General Practitioners

A cannabis attitude index was used in an Irish medical study of general practitioners (GPs; Crowley et al., 2017). The reasons for using this index in the current study was that it was the only research that had been undertaken in Europe in healthcare regarding attitudes toward cannabis. Further, Ireland and the UK were in the early stages of legalizing medical cannabis in comparison to the longer implementation timelines in the United States and Canada. Although the Irish study focused on GPs, it did not undertake any group levels of analysis such as professional identity influences on attitudes and group norms. The current UK study involved healthcare professionals from various disciplines regardless of whether they could prescribe as we were interested in the influence of professional identities on attitudes and norms related to recommending cannabis.

Regulations were amended in Ireland in 2014 for certain cannabis-based medicinal products to be used in the form of Savitex®, which is indicated for the treatment of multiple sclerosis symptoms. At the time that the Irish study was undertaken, 2017, this was the only change that had occurred in Irish drug regulations and may have influenced the views of the GPs in the study. It was also suggested in the research that the Irish GPs had negative attitudes toward mental health impacts based on their experience of working with Ireland's addicted youth at the front line. Further, national treatment data also pointed to cannabis being a problematic drug among new cases presenting for drug treatment (Bellerose et al., 2012).

The Present Study

Medical cannabis represents one of the many shifts in public health policy that results in changes to practice that healthcare professionals are required to implement. The current research aimed to determine if healthcare professionals are influenced by professional identities and group norms concerning recommending cannabis to patients. Specifically, the following three questions will be explored in this study:

1. How do the attitudes and norms of various professional healthcare groups differ concerning recommending cannabis?
2. Are healthcare professionals influenced by their professional group's attitudes and norms concerning recommending cannabis?
3. Does the level of identification with their professional groups by healthcare professionals have an impact on attitudes, norms, and well-being?

Expectations

In line with previous studies examining in-group identification (Burford & Rosenthal-Stott, 2017; Jetten et al., 2014; Leach et al., 2008), it was expected that identification with the professional group would influence the effect of perceived group norms on personal attitudes regarding the medical use of cannabis. Participants with a higher identification with the professional group would more easily align their personal attitudes with perceived group norms (Hypothesis 1). It was also expected that identification with the professional group would also influence perceived group norms (Hypothesis 2). There are two possibilities here. It could be that professionals with higher identification have group norm perceptions that are close to the average perceived group norm attitude of their professional group (Option A). However, having a higher professional identification can also result in being more up to date on

developments and therefore being aware of positive applications in the field. This could translate into more positive perceptions of the group norm, which may not correspond to the average rating (Option B). Given the extensive body of work on the social cure (Jetten et al., 2012) that outlines the health benefits of positive social identities, it was expected that participants with higher professional group identification would score higher on feelings of well-being (Hypothesis 3).

Method

This was a questionnaire study with data collected from healthcare professionals working in the National Health Service in the UK. Potential participants were asked to complete the questionnaire and share the survey within their networks. Participants were also recruited using Prolific (https://www.prolific.co).

Participants

The final sample consisted of 150 participants (137 females and 13 males) who were healthcare professionals in the UK. The mean age was 46.5 years, with 41.3% aged over 50 and 58.7% aged less than 50. Within the sample, 51.3% had over 20 years' experience in their profession, and 48.7% had less than 20 years' experience. There were eight professional groups identified from the data. These were clinical practice, general practice, nursing, pharmacy, paramedics, community health, health administration, and health research.

Procedures

This study was conducted online. Participants were recruited through Prolific and networking. At the outset, participants were presented with the objectives and aims of the study. Participants were then asked to indicate their primary professional group in order to make identification with their professional identity salient. This was followed by measures designed to capture their level of in-group identification. Participants were then asked to complete questions related to cannabis from their personal perspective and from the perspective of how they felt their professional group would answer the same questions. Measures related to age, length of time in profession, experience of use with, and intended future recommendations of cannabis were also captured.

Measures

Attitudes Toward Cannabis

An attitude index used in an Irish medical study of GPs was adapted to determine individual attitudes towards cannabis (Crowley et al., 2017). It was comprised of 11 items and was a 5-point Likert scale, measuring agreement with a series of statements related to aspects of cannabis use in medicine. The correlations between the individual perspective attitude items are presented in Table 7. Items 1 to 7 show significant correlations with each other, except that Items 2 and 4 are not significantly correlated. The items that are formulated negatively show, as expected, a negative correlation with the items that are formulated positively. Items 8 and 9, on the other hand, are uncorrelated with the other items and only show a significant, positive relationship with each other.

An exploratory factor analysis (EFA) using maximum likelihood extraction was carried out. The scree plot (Appendix C) suggested a two-factor solution, that is shown in the left part of Table 8. The two factors explained 56.2% of the variance. In line with the results from the correlation analysis, Items 1 to 7 load on one factor and Items 8 and 9 load on a separate factor. A separate EFA on Items 1 to 7 revealed a one factor structure (as shown by a sharp drop in the scree plot after one factor and no further sharp decreases thereafter). This further confirms the decision to make two scales. The content of the items of the first scale are about the personal attitude toward medical use. *This scale has an acceptable* reliability, Cronbach's $\alpha = .78$ (with Items 2, 3, and 4 recoded). The second scale reflects a personal attitude toward the legal situation of cannabis and has a good reliability, $\alpha = .87$.

Table 7

Correlations Between the Individual Perspective Attitude Items

	Item	2	3	4	5	6	7	8	9
1	Cannabis should be legalised for medical use	-.28**	-.27**	-.36**	.45**	.46**	.46**	-.14	-.08
2	The decriminalisation of Cannabis leads to its increased use		.17*	.12	-.32**	-.30**	-.31**	.03	.00
3	Cannabis use has a significant adverse effect on patients' physical health			.49**	-.21**	-.18*	-.20*	.07	-.07
4	Cannabis use has a significant adverse effect on patients' mental health				-.27**	-.19*	-.22**	.09	.04
5	Cannabis has a role to play in pain management					.66**	.70**	-.06	-.02
6	Cannabis has a role in the treatment of multiple sclerosis						.73**	-.07	-.13
7	Cannabis has a role in palliative care							-.07	-.03
8	The current regulatory approach to medicinal cannabis is well understood								.78**
9	The process to help patients legally access Cannabis is well understood								

Table 8

Factor Loadings for the Individual and Norm Items

		Individual		Norm	
	Item	Factor 1	Factor 2	Factor 1	Factor 2
1	Cannabis should be legalised for medical use	-.078	**.611**	**.605**	-.138
2	The decriminalisation of Cannabis leads to its increased use	.023	**-.415**	-.221	**.370**
3	Cannabis use has a significant adverse effect on patients' physical health	-.084	**-.269**	-.168	**.890**
4	Cannabis use has a significant adverse effect on patients' mental health	.014	**-.302**	-.130	**.421**
5	Cannabis has a role to play in pain management	-.008	**.831**	**.791**	.129
6	Cannabis has a role in the treatment of multiple sclerosis	-.134	**.799**	**.871**	.065
7	Cannabis has a role in palliative care	-.033	**.847**	**.878**	.119
8	The current regulatory approach to medicinal cannabis is well understood	**.770**	-.043	**.295**	-.026
9	The process to help patients legally access Cannabis is well understood	**.999**	.001	.221	**.466**

Perceived Norms and Cannabis

We then asked participants to respond to the same items adapted from the Irish study (Crowley et al., 2017) but this time from the position of professional identity group member. For example, "In relation to the Nursing group you belong to, what do you believe are the opinions of members of that group about the following?" Using the same 5-point Likert scale, measuring agreement with a series of statements related to aspects of cannabis use in medicine index, perceived group norms regarding recommending cannabis were measured. The correlations between the perceived norm items are presented in Table 9. There are significant correlations between the items. Yet, Item 4 seems to be uncorrelated to all other items. Moreover, in contrast to the strong correlation found between Items 8 and 9 when it comes to individual opinion, these items appear to be completely uncorrelated when it comes to the perceived group norm.

The scree plot (See appendix C) suggested a two-factor solution, which is shown in the right part of Table 8. These two factors together explained 55.4% of the variance. The factor structure and loadings changed from the personal to the group level. The first factor is about the perceived group norms of medical use of Cannabis. The second factor is about the perceived group norms of the consequences of use. The first scale showed good reliability, $\alpha = .80$. The second scale, however, showed a reliability of $\alpha = .57$. The results on this scale are therefore interpreted more cautiously.

Table 9

Correlations Between the Perceived Norm Items

	Item	2	3	4	5	6	7	8	9
1	Cannabis should be legalised for medical use	-.11	-.14	-.29**	.42**	.49**	.52**	.31**	.01
2	The decriminalisation of Cannabis leads to its increased use		.36**	.11	-.21*	-.12	-.13	-.05	.16
3	Cannabis use has a significant adverse effect on patients' physical health			.37**	-.03	-.10	-.05	-.05	.37**
4	Cannabis use has a significant adverse effect on patients' mental health				-.09	-.09	-.01	-.12	.06
5	Cannabis has a role to play in pain management					.71**	.70**	.18*	.29**
6	Cannabis has a role in the treatment of multiple sclerosis						.78**	.24**	.26**
7	Cannabis has a role in palliative care							.29**	.21*
8	The current regulatory approach to medicinal cannabis is well understood								-.04
9	The process to help patients legally access Cannabis is well understood								

Behaviors and Cannabis

Three yes-and-no questions related to personal use and recommendations were used to measure behavior.

- Have you used cannabis in the last 3 years?
- Have your recommended cannabis to patients in the last 3 years?
- Have you recommended cannabis to family/friends in the last 3 years?

The fourth question was related to intention to recommend cannabis. It was responded to as yes, no or maybe.

- Are you likely to recommend cannabis in the next 2 years?

Use of Professional Resources

Participants were asked if they had sourced information about cannabis. Three items were given as yes or no questions.

- Continuing professional education
- Medical literature
- Other physicians

In-Group Identification with Professional Groups

Eleven items from the hierarchical (multicomponent) model of in-group identification scale were used to measure in-group identification (Leach et al., 2008). This validated measurement scale integrates five main components into two higher-order dimensions of: *group-level self-definition* (individual self-stereotyping, in-group homogeneity), for example, "I have a lot in common with the average person in this group"; and *self-investment* (solidarity, satisfaction, and centrality), for example, "Being in this group is an important part of how I see myself." Participants rated their agreement with these statements on a scale from 1 (*strongly agree*) to 7 (*strongly disagree*) The overall scale of the 11 items used for the measurement has a strong reliability index ($\alpha = .94$).

Subjective Well-Being

The assessment of subjective well-being was performed with two items which focused on happiness and life satisfaction. These questions often have been used for this purpose in surveys such as the European Social Survey (Diener, 2000; Swift et al., 2014). The questions

were “Taking all things together, how happy would you say you are?” and “All things considered, how satisfied are you with your life as a whole nowadays?” Reliability of this two-item scale was good with an alpha of .84.

Results

The data were analyzed in two steps. First, the descriptive statistics were explored, and then the hypotheses were tested. As shown in Table 10, professional group identification was high with a mean of 5.47. The perceived group norms of the consequences of cannabis use was higher than the perceived medical use group norms.

Table 10

Means, Standard Deviations, and Correlations of Key Variables

Key Variables	*M*	*SD*	Personal attitude legal situation	Perceived group norm medical use	Group norm consequences	Group identification	Well-being
Personal attitude medical use	3.57	0.56	-.08	.53**	-.41**	.06	.10
Personal attitude legal situation	2.15	0.87		.06	-.19*	-.00	.10
Perceived group norm medical use	3.39	1.69			-.07	.25**	.08
Group norm consequences	3.75	0.65				.05	-.13
Group identification	5.47	0.93					.16*
Well-being	5.29	1.39					

Attitudes, Norms, and Behaviors of Groups

Not all professional groups were well represented. Therefore, the groups with less than 10 were combined into an "other" category. The mean and standard deviations of the groups are shown in Table 11. A multivariate analysis of variance had been used to compare the averages of the professional groups for individual attitudes, but no effect was found, Wilks' $\lambda = 0.94$, $F(10, 280) = 0.89$, $p = .544$. Similarly, no group effect was found for the perception of the professional norms, Wilks' $\lambda = 0.92$, $F(10, 280) = 1.21$, $p = .285$.

Furthermore, all participants stated they had not recommended Cannabis to patients in the last three years (although three participants did not answer this question). Of all participants, 10% had recommended Cannabis to family or friends (with the same three participants not answering this question). This was not affected by the professional group that a person belonged to, $X^2(DF = 5) = 3.58$, $p = .611$. Only a very small proportion of 6.3% of the professionals had used Cannabis in the last three years (absolute number of people ranging from 0 for the pharmaceutical professionals to 3 for the nursing professionals). The use of Cannabis was not significantly related to the professional group, $X^2(DF = 5) = 2.11$, $p = .834$.

We also tested whether the professional group predicted the likelihood of recommending the use of Cannabis in the next two years. This question was answered on a 3-point scale (*yes*, *no*, *maybe*) and was therefore treated as an ordinal level variable. We did not find a group effect, $X^2(DF = 5) = 3.42$, $p = .635$. Of all participants, 58.8% would not recommend the use of Cannabis, and 36.1% would maybe recommend the use of Cannabis in the next two years.

Since none of the participants had recommended Cannabis to patients, we could not analyze whether this was influenced by their attitudes or perceived professional norms. There was no difference in the medical group perceived norms reported by those professionals that did or did not recommend Cannabis to family or friends, Wilks' $\lambda = 0.97$, $F(2, 144) = 2.37$, $p = .097$. There was, however, a significant difference in the personal medical use attitudes of professionals who did or did not recommend Cannabis to family or friends, Wilks' $\lambda = 0.96$, $F(2, 141) = 3.08$, $p = .049$. The attitude towards the legal situation of cannabis was about the same for those that did ($M = 2.27$, $SD = 0.94$) or did not ($M = 2.14$, $SD = 0.87$) recommend Cannabis, $t(145) = 0.55$, $p = .584$. Yet, the personal attitude medical use of those who recommended Cannabis to family or friends were more positive ($M = 3.88$, $SD = 0.44$) than of those who did not ($M = 3.52$, $SD = 0.55$), $t(145) = 2.47$, $p = .015$.

Table 11

Means and Standard Deviations of the Professional Groups on the Scales of Attitudes and Perceived Norms

	Personal Attitude Medical Use		Personal Attitude Legal Situation		Group Norm Medical Use		Group Norm Consequences	
Professional Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Clinical Practice	3.62	0.37	2.47	1.11	3.91	0.48	3.77	0.41
Nursing	3.59	0.59	2.16	0.78	3.82	0.62	3.62	0.58
Pharmaceutical	3.46	0.63	1.90	0.81	3.72	0.64	3.91	0.47
Community Health	3.61	0.47	2.26	0.78	3.70	0.56	3.48	0.49
Health Administration	3.63	0.51	2.31	0.94	3.66	0.50	3.47	0.53
Other	3.52	0.68	1.85	0.89	3.67	0.94	3.52	0.54
Total	3.58	0.56	2.15	0.87	3.75	0.65	3.60	0.54

Table 12

Deviations from the Group Mean Norm Medical Use for Different Levels of Identification with the Professional Group

Level of Identification	*M*	*SD*
-1 SD < Score, Low Identification	-0.26	0.71
-1SD > Score <1SD, Average Identification	-0.03	0.61
Score > + 1 SD, High Identification	0.47	0.50

Note. Deviation was determined by calculating the group mean centered score.

Professional Identification: Personal Attitudes Toward Medical Use of Cannabis

Given that the attitude towards the legal situation only showed a weak (negative) correlation with the group norm about its legitimacy and the unreliability of this scale, we used the personal attitude about medical use to test the first hypothesis (H1). The potential moderating effects were tested using Hayes' process model (Hayes, 2015). It was tested whether identification with the professional group would be a moderator in predicting personal attitudes of medical use by the perceived group norms. Inclusion of the interaction between perceived norms of medical use and a person's attitude did not show a significant increase in the variance explained, $\Delta R^2 = .003$, $F(1, 142) = 0.76$, $p = .385$. Inclusion of the interaction between the perceived norm of consequences of use and a person's attitude also did not show a significant increase in the variance explained, $\Delta R^2 < .001$, $F(1, 142) < 0.01$, $p = .966$. Therefore, the first hypothesis could not be confirmed.

Professional Identification: Perceived Group Norms Toward Medical Use of Cannabis

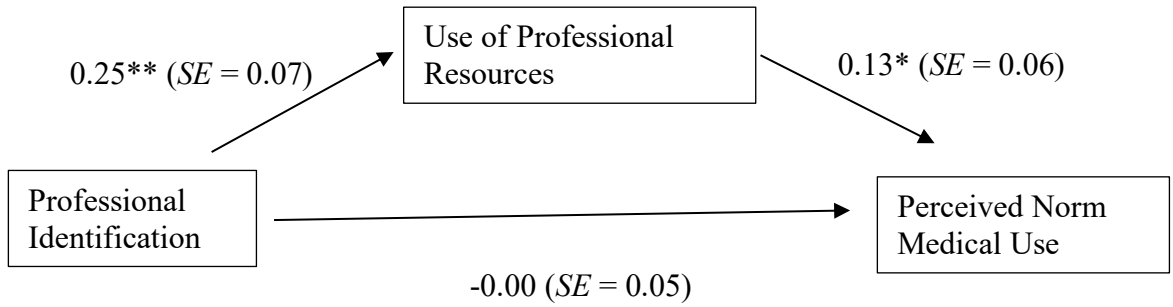
In order to test our second hypothesis (H2), we first calculated the group mean centered values of group norm medical use as the deviation from the group perception. This variable followed a normal distribution with a mean score of zero (M = 0, SD = 0.65), Kolmogorov-Smirnov statistic $D(147) = 0.06$, $p = .200$. Whereas it was positively associated with identification, $r = .24$, $p = .003$, the absolute deviation was not related with identification, $r = .06$, $p = .439$. For interpretation purposes, we analyzed the deviation from the mean perceived group norm medical used by low (- 1 SD), average or high (+1 SD) identification with the professional group. Analysis of variance showed an effect of identification, $F(2, 144) = 9.07$, $p < .001$. Post hoc Tukey HSD tests revealed that, in line with the just described correlations, people with a high identification had more positive deviations from the group mean perceived norm of medical use ($M = 0.47$, $SD = 0.50$) compared to people with a low ($M = -0.26$, $SD = 0.71$, $p < .001$) or average identification ($M = -0.03$, $SD = 0.61$, $p = .002$). There was no significant difference between the low and average identification group on the deviations from the group mean scores, $p = .209$ (See table 12). Therefore Hypothesis 2 could be confirmed. Participants with higher group identification scored more positively on their perception of the group norm of medical use.

We also asked the participants if they had used medical literature, continuing medical education and other physicians as sources of information about the use of Cannabis, as we expected under option b that those with a higher professional identification might have more

positive perceptions of the group norms because they were exposed to more positive applications of Cannabis in the field. Indeed, we found a positive association between identification and the use of those sources (r = .29, p < .001). Using Hayes process model for mediation, we found that the association between identification and perceived group norm medical use to be fully mediated by the use of professional resources R^2 = .04, F(2, 144) = 3.10, p = .047 (see Figure 4).

Figure 4

Mediation of the Relationship Between Professional Identification and Perceived Norm Medical Use by Use of Professional Resources



Note. *p < .05, ** p < .01

Professional Identification and Well-Being

Identification with the professional group also showed a weak, positive association with well-being. This confirms hypothesis 3. However, there were no significant differences across the professional groups, F(5, 144) = 1.83, p = .111.

Discussion

This study sought to determine if healthcare professional's identification with their professional groups and perceived group norms interactively determined willingness to recommend cannabis. We found no support for Hypothesis 1. Those that were more highly identified with their professional group did not present attitudes more similar to the perceived group norm in relation to recommending cannabis. We found support for Hypothesis 2 (Option A), whereby those participants with higher group identification scored more positively on their perception of the group norm of medical use. We also found support for Hypothesis 2 (Option

B). Participants with a higher professional identification had more positive perceptions of the group norms because they were exposed to resource related to the applications of cannabis in medicine. Participants who were more identified with the group scored higher on feelings of well-being, confirming Hypothesis 3.

We found no differences between the professional healthcare groups concerning attitudes and norms related to recommending cannabis. Given the strong identification normally found across different professional disciplines in healthcare (Bartunek, 2011), this was an interesting result and suggested a possible superordinate identity of "healthcare professionals." The salience of different identities varies with context, and a particular identity will be assumed from a number of options on the basis of contextual cues (Turner et al., 1987). Therefore, participants identifying with the UK National Health Service may have influenced the superordinate identity. The superordinate identity also may have been made salient through the questions related to location and identifying professional healthcare groups.

In 2018, the UK legislation changed to allow for cannabis medicine to be used in healthcare; although later than in Ireland, the attitudes toward consequences were less negative in the current study than in the Irish study. Another key difference between the samples was that the Irish study contained only GPs, while the current UK study contained participants from various health disciplines. The group norms of the GPs as a professional identity were not measured in the Irish study, as opposed to the current UK study that found correlations between group identification and norms related to the medical use of cannabis-based medicine.

A limitation of this study was the use of a convenience sample. The characteristics of the sample were also heavily weighted toward women and the nursing profession. Given the length of the survey, we were also restricted to using adapted versions of previous measures rather than the full instruments.

A highlight of the research was that this was the first time that the influence of professional identities on attitudes and norms of healthcare professionals toward medical cannabis has been undertaken. Previous studies have focused on the individual views and behaviors of healthcare professionals and have not taken into account the influence that professional identities have on group members (Braun et al., 2018; Philpot et al., 2019; Szyliowicz & Hilsenrath, 2019). Further, this highlights that there are social factors that determine behavior, such as the implicit norms of professional identities, and that these need to be considered to ensure effective implementation of change in healthcare, such as the introduction of medical cannabis.

Conclusion

Healthcare professionals face many changes in a rapidly shifting global context. This article began by recognizing that cannabis represents a significant development from ‘drug’ to ‘medicine,’ particularly for those working in healthcare. The influence of identification with the professional group on the attitudes and norms of healthcare professionals in relation to medical cannabis was examined in the context of the recent changes to cannabis legislation in the UK. We used an online survey to measure identification with professional identities and the attitudes, norms, and behaviors of healthcare professionals. Participants were recruited through Prolific and networking. It was found that higher identification with professional groups influenced the perceived norms of the participants in relation to recommending cannabis. This provides an opportunity to improve implementation through group-based interventions that focus on the implicit norms of the collective group of healthcare professionals in relation to medical cannabis.

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Chapter 5

Online Mapping of Social Identities: Acceptance of Change Among UK Healthcare Professionals

Abstract

Globally, healthcare is in a constant state of change due to factors such as increased demand, technological advances, policy changes, and resource challenges. Perhaps because of this, it is common for healthcare professionals to inhabit multiple groups across local, international, and virtual domains. The social identity approach examines the influence of groups that people are identified with (i.e., are important to one's sense of self) and how this influences such things as attitudes and behaviors, particularly in relation to health, well-being, and interactions with external groups. Specifically, an important body of work known as the "social cure" research has continued to confirm both the criticality and impact of multiple group memberships on physical and mental health and well-being. As a result of this research, an online applied method was developed to allow people to create their subjective social identities through a mapping process. The groups created can then be understood in terms of their importance to members, compatibility between groups, and normative influences in relation to specific contexts and situations (Bentley et al., 2019). In this exploratory study, we used the mapping tool to examine the subjective social identities and association with the Acceptance of Change scale (Di Fabio & Gori, 2016) of 50 UK-based healthcare professionals. An outcome of the subjective social identity map creation was that family groups were created the greatest number of times by participants, with work groups being the second highest category of group created. In relation to the social identity measures, the results suggest that more important groups, in terms of positivity toward and support received from group measures, negatively influenced acceptance of change. Participant well-being results also negatively influenced acceptance of change, whereby the higher the individual well-being results overall, the less open participants were toward moving toward change.

Introduction

Health services in the 21st century have faced increasing challenges, amidst remarkable healthcare improvements, gained through technological and scientific innovations (Akay & Tamura, 2015). Challenges have emerged due to an increasing global population, the rise of non-communicable diseases, the aging of the global populations, and the consequences of climate change (Akay & Tamura, 2015). Meanwhile, health services have contended with these increased strains while managing diminished funding and changes in spending caused by turbulent political situations (Appleby, 2013). There have been pervasive health inequalities both within and between countries, as well as rising issues with quality and costs (Marmot, 2020; Shawky, 2020). Healthcare professionals have experienced the pressure of these challenges as their organizations adapt to shifting social, economic, and health demands. Professional identities are a subset of social identities and defined as "an individual's self-definition as a member of a profession and is associated with the enactment of a professional role" (Chreim et al., 2007, p. 1515). Professional identities are shaped by a concern for professional autonomy and a commitment to professional values (Barbour & Lammers, 2015).

During organizational change, medical professionals can experience, through the many alterations occurring in their workplaces, threats and challenges to their professional identities (Korica & Molloy, 2010). Such changes can include restructuring, policy implementation, patient-centered care processes, shared services, and community-based health approaches (Walsh et al., 2018). These threats to identity can result in behaviors by healthcare professionals that undermine or impede the proposed changes. Given the rate of change occurring in healthcare, it is critical to examine and engage with the relevance of culture and identities if change implementation is to be successful (Johnson et al., 2016; Walsh et al., 2018).

Globalization, Change, and Social Identities

Globalization has led to increasing interconnectedness between cultural, political, and technological practices across national borders (Chiu et al., 2011). These changes have also dramatically impacted individuals at a psychological level in terms of identities and behavior (Rosenmann et al., 2016). One consequence of improved accessibility across geographic boundaries, physical or virtual, has been the overlap and complexity in the number of social identities held by people at both local and global levels. According to social identity theory, people sometimes see themselves (and behave) as individuals, while at other times as group

members (Tajfel, 1978). These identities incorporate categories such as nationality, profession, or gender and may exist based on shared interests and activities. When their social identities as members of various groups become engaged, these have cognitive, evaluative, and affective consequences on the attitudes and behaviors of individuals. As populations increasingly dwell in a global society and move across geographical, cultural, and social boundaries, traditional local group membership is being expanded to broader group and social categories (Karner, 2011; Rosenmann et al., 2016).

The social identity approach (Brown, 2019) provides a key theoretical umbrella in social psychology and has, at its core, a focus on the influence of groups. Social identity theory (Tajfel, 1974) outlines that part of a person's self-concept is derived from belonging to groups such as family, social, and professional groups. Social identity theory was extended by self-categorization theory (Turner et al., 1987), which suggests that in order for membership of a group to influence individuals, the group should generally be perceived as meaningful and relevant to the self. In particular, the group should provide a basis for the individual to understand their place in the world (Turner et al., 1987). Combining these two theories, the social identity approach describes the intersection between individuals with social realities and the evolving group-level phenomena within and between groups (Abrams & Hogg, 1990).

Research across self-categorization theory has provided an understanding of the psychological and intra-psychic processes of categorization that result in individuals being unified in psychological groups (Hornsey, 2008). This unification process can influence group member self-esteem and support, influence behaviors through group norms, and impact how members of the group deal with out-groups (Hogg et al., 2017). Professional identification processes have been examined in healthcare in terms of formation as during training (Burford & Rosenthal-Stott, 2017; Foster & Roberts, 2016) and ongoing impact in situations such as work in continuing education (Chan et al., 2018) and cross disciplinary team environments (Cain et al., 2018). Professional identities and their interactions are increasingly understood as critical to the successful implementation of change in healthcare, specifically in relation to effective implementation of policy and clinical practices requiring significant behavioral shifts of healthcare professionals (Graco et al., 2019; Haskell et al., 2020; Willetts & Lazarus, 2018).

Change and Identity

Ongoing societal, environmental, and organizational changes impact each individual. Across numerous disciplines, the study of change encompasses areas such as managing change,

encouraging change, motivations for change, and the perceived urgency of the change required (Hagger et al., 2020). Within social psychology, the predominant area of change research has been directed toward social and collective change (Colvin et al., 2015; Gatersleben et al., 2014). For example, minority groups have been studied using social identity theory showing that, through collective action, groups aim to maintain or acquire a distinct social identity (Tajfel & Turner, 1986; van Dommelen et al., 2015). Identity process theory has explored several areas, including the structure of personal identity and the strategies for coping that are used when facing a threat or change resulting from social change (Jaspal & Breakwell, 2014). Specifically, identity threat theory has examined how individuals regulate the structure of their identities in response to threats from social change (Emerson & Murphy, 2014; McKeown et al., 2016).

In psychology more broadly, resistance to change is considered to be both predictable and a barrier to overcome. The subject has been researched extensively in applied areas such as organizational (Murrar & Brauer, 2019), environment (Hanus et al., 2018), and health psychology (Jones & Van de Ven, 2016). Studies have also concluded that identity threat predicts resistance to change, particularly in relation to pro environmental and health behaviors (Feygina et al., 2010; Murtagh et al., 2012; Nilsen et al., 2016). The study of acceptance of change (AC), such as that undertaken by Di Fabio and Gori (2016), emerged from positive psychology. The central tenet of which was an interest in being able to determine approaches for people to be able to deal with change constructively, rather than demonstrate resistance, thereby improving quality of life and well-being with the subsequent societal benefits. This is the first study we are aware of that has explored the interactions of social identities with AC at an individual level.

Social Identity Mapping

Social identity mapping (SIM) is an applied method that was developed through health research undertaken into social identities. This tool measures subjective group importance, multiple group memberships, compatibility between groups, continuity of identities, group support and the importance of each (participants have three choices of either important, medium or less important groups), and the interaction between them (Cruwys et al., 2016). It was developed from a need in applied environments to provide a social identity tool that is accessible to participants and researchers (S. A. Haslam, 2014). It also allows subjective reporting of identities by participants beyond self-reported measures that use pre-determined social identities (S. A. Haslam et al., 1999).

Designed to offer various measures for group membership, SIM provides a reflective process of exploring social identities for participants in their specific contexts. The online social identity mapping (oSIM) tool designed by Bentley et al. (2019) offers opportunities, through its scalability of delivery, for use in large-scale studies utilizing a range of populations. The tool also provides options to target specialized or hard-to-reach groups and to maintain privacy through online contact. The questions asked of participants can be adjusted in relation to the social identity maps, reflecting the needs of the research being undertaken and the context it is located within.

The Present Study

This study examined the social identities of the participating healthcare professionals, the social identity measures of each group, and associations to the acceptance of change scale (ACS). Given the ongoing challenges being faced by those working in the National Health Service in the UK, whereby there is continued change through restructuring, cost cutting, and patient demands, the findings of the current study are important in enabling the online mapping and exploration of group memberships and their interaction.

The aim of the study was to examine how the social identities of healthcare professionals influence AC. The study sought to answer several questions, including:

1. What are the subjective social identities of participants?
2. What is the relationship between social identities and AC?
3. Does well-being influence AC?

Expectations

Based on previous research examining social identities and change (Murtagh et al., 2012; Walsh et al., 2018), we expected that there would be a difference between the categories of social identities and their influence on AC dimensions (Hypothesis 1). We also expected that differences across social identity measures, such as importance of group and supergroups (Martyn et al., 2019; Schmid et al., 2013), would positively influence AC (Hypothesis 2). Using data collected in our previous study, we expected AC to be positively influenced by well-being (Hypothesis 3).

Method

The current study utilized the oSIM questionnaire to collect data from healthcare professionals working in the National Health Service in the UK. Using Prolific (https://www.prolific.co), we were able to customize the sample through a pre-screening function and to invite participants of our previous study to be involved.

Participants

At the time of undertaking the study (May 2020), COVID-19 demands were impacting the UK healthcare system. We re-engaged with a sample of 150 UK healthcare professionals who had participated in a previous study undertaken 6 months prior. From the original sample, 68 of these participants consented to participate in the current study. After checking the data for errors, the final sample consisted of 50 participants. The most significant difference in the demographics between the two studies was the years of experience–less people with over 20 years' experience participated in this study than in the previous study. In relation to professional groups, the main difference in participation was community health; 14% of the previous sample were from community health while, in the current study, the corresponding percentage was 8% (see Table 13).

Table 13

Participant Demographics and Professions (Current and Previous Study)

Demographic	Previous study	Present study
Number of Participants	150	50
Mean Age	46	45
Gender	137 f, 13 m	44 f, 6 m
More than 20 years' experience	51%	38%
Less than 20 years' experience	49%	62%
Professional Group Membership of Participants		
Clinical Practice	10%	9%
General Practice	7%	8%
Nursing	35%	39%
Pharmaceutical	10%	12%
Paramedics	3%	2%
Community Health	14%	8%
Health Admin	14%	14%
Health Research	5%	2%
Other	3%	0.0%

Procedures

We outlined to participants that this study had three parts. After completing demographic questions in Qualtrics, participants were then directed to the oSIM software. Participants completed an interactive on-screen tutorial presenting instructions on how to build a social identity map. The map creation order was as such: (a) categorizing and naming the groups in one's life; (b) rating the level of importance of each group; (c) answering questions about each group (e.g., how positive one feels about the group); (d) moving groups around so that similar groups are closer together; and (e) rating the (in)compatibility of pairs of groups in the map. After undertaking their map, participants were then redirected back to Qualtrics in order to complete questions related to change.

Measures

Social Identities and Mapping Measures

Using SIM, participants are able to report subjectively on their current or emergent social identities. In the current study, this mapping was done by participants using oSIM software that allowed participants to visually represent and assess their subjective network of group memberships (Cruwys et al., 2016). By using the oSIM software, we were able to obtain the groups that participants indicated they were involved in and the amount of compatibility between the groups (Bentley et al., 2019).

Participants were also asked to rate each group they created in relation to positivity (Jetten et al., 2015), support (Drury et al., 2016), and representativeness (Jetten et al., 2017) on a scale ranging from 1 (*not at all positive/representative/supportive*) to 5 (*very positive/representative/supportive*). Supergroups (significant groups) and infragroups (not significant groups) defined as per aggregated measures of positivity, support and being representative of the group were also obtained from the social identity maps.

The importance of each group was obtained through the size of the group given to it by the participant: large (*important*), medium (*medium importance*), and small (*less important*). The instructions outlined to participants was that they had to choose the size of the group based on these three options related to group importance. These measures had been validated in previous SIM studies (Bentley et al., 2019). Overlap of membership between the social identities was also obtained through the use of a scale ranging from 1 *(No members of this group belong to other groups)* to 10 *(Many members of this group belong to other groups)*.

Group Categories

We conducted qualitative template analysis (Brooks et al., 2015) on the group names that participants gave to their identities and matched these with the level of importance they gave to these groups. Each group is named and labelled in the software as the groups are created. Four categories were then established from the labels given and coded as per the following: (1) family, (2) work group, (3) friends, and (4) interest groups. Interest groups included those related to hobbies, politics, and any other recreational activities. We coded the group names captured from Group 1 through to Group 4 for each participant and combined these with the importance of group measures.

Acceptance of Change Scale (ACS)

ACS is a self-report measure that assesses the tendency of people to accept or move toward change (Di Fabio & Gori, 2016). The ACS uses a 5-point Likert scale (1 = *not at all*, 2 = *a little*, 3 = *somewhat*, 4 = *much*, 5 = *a great deal*). The measure consists of 20 items across five dimensions. These dimensions are: *positive reaction to change* (e.g., "I am able to tolerate even the negative aspects of change") This factor was good with an alpha of .84. *Change seeking* (e.g., "I am always looking for changes in my everyday life") with an alpha of .81 this factor was good; *cognitive flexibility* (e.g., "It's easy for me to change my mind when I realize that I am wrong") with an alpha of .63; *predisposition to change* (e.g., "When I am faced with a change, I can see things from multiple perspectives") with an alpha of .67; and *support for change* (e.g., "I trust the people close to me when faced with change") with an alpha of .63.

Subjective Well-Being

To assess subjective well-being, we used two items to measure happiness and life satisfaction. The questions were "Taking all things together, how happy would you say you are?" and "All things considered, how satisfied are you with your life as a whole nowadays?" The internal consistency of these two questions was good (Cronbach's α: .844). Surveys, such as the European Social Survey, have previously used these questions (Diener, 2000; Swift et al., 2014).

Results

In the first section, the social identities were analyzed using descriptive statistics generated from the mapping software. We then undertook qualitative analysis of the subjective social identities and coded the groups. These were then combined with the importance rating of each group. In the second section, we undertook correlation analysis and then multivariate regression analysis of the social identity measures from the mapping software with the ACS dimensions. Taking data collected from the participants in the previous study, related to well-being, we also analyzed the association with the ACS dimensions.

Section 1 – oSIM Analysis

oSIM Results

Descriptive statistics of the oSIM are displayed in Table 14. The mean for the number of groups per participant was 4.32. The mean for the number of supergroups (calculated as the number of groups that scored above the mid-point on all four quality indicators: positivity, representativeness, and support, and that had greater than 50% of compatible links to other groups) was 1.26. The mean for the number of important groups was 1.46. The mean for group membership overlap (in which members of the current group overlap with other groups) was 4.11.

Table 14

Range, Mean, and Standard Deviation of oSIM

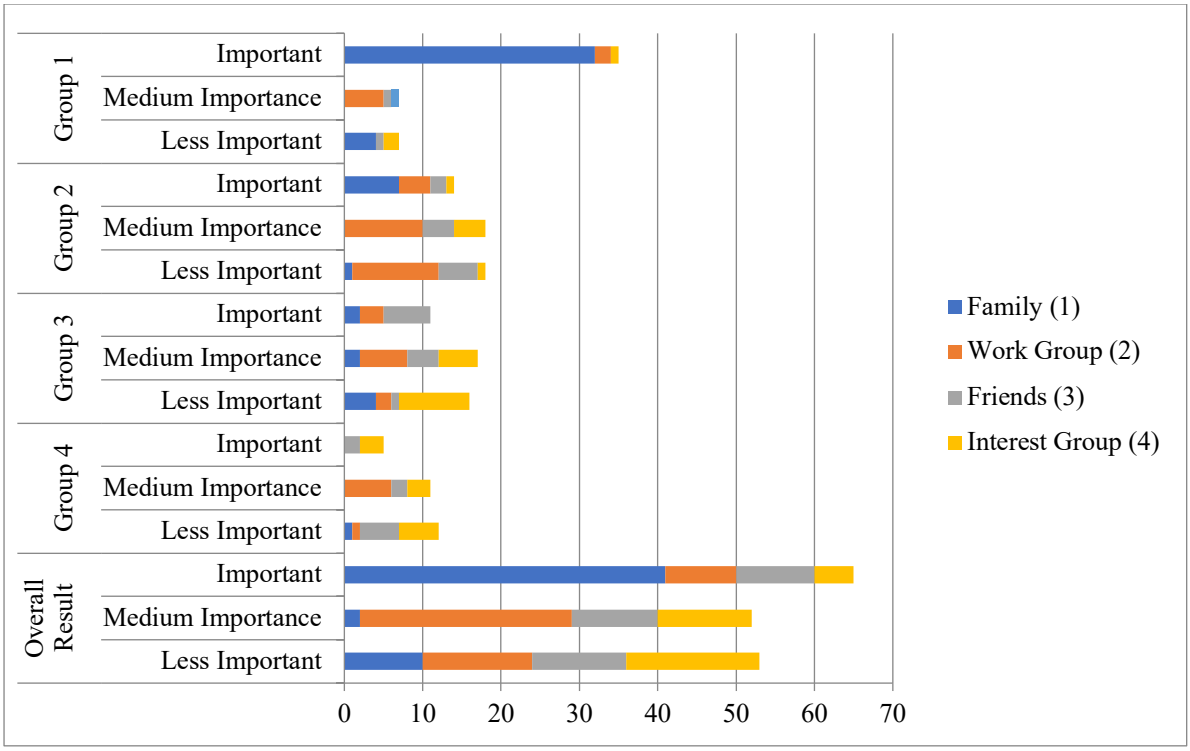
Key variables	Range	*M*	*SD*
oSIM: Number of groups	2-12	4.32	1.95
oSIM: Compatible groups		2.68	2.00
oSIM: Prop. of compatible groups		.660	.398
oSIM: Number of supergroups	2-12	1.26	1.397
oSIM: Number of infragroups	2-12	.04	.198
oSIM: Number of important groups	0-5	1.46	.994
oSIM: Group membership overlap	1-10	4.11	2.28
oSIM: Positive about group	1-5	4.35	.481
oSIM: Representative of group	1-5	3.816	.664
oSIM: Support from group	1-5	3.798	.716

Social Identities

Coding was undertaken of the first four groups created by participants, into the following categories: (1) family, (2) work group, (3) friends, and (4) interest groups. We combined this with the importance given to each group by the participants (see Figure 5). In the overall (all groups combined) coded results, family was created 39 times (78%) and rated as important. Work was created 32 times, with participants rating it 18% as important, 38% as medium importance, and 28% as less important. Interest group was created nine times in the overall results.

Figure 5

Social Identities Created, Level of Importance (1-4 and Overall) by Participants



Maps Containing Supergroups and Infragroups

Three participant maps contained four or more supergroups (see Figure 6 example). Each of these maps also had no conflict lines between the groups in relation to compatibility. All links were either compatible or very compatible, as represented by the dashed green line or hard green line. One map contained an infragroup (see Figure 7). This was related to the

professional (work) identity. There was also a neutral compatibility line between the groups, represented by the orange dashed line.

Figure 6

Example of a Participant Map with Five Supergroups

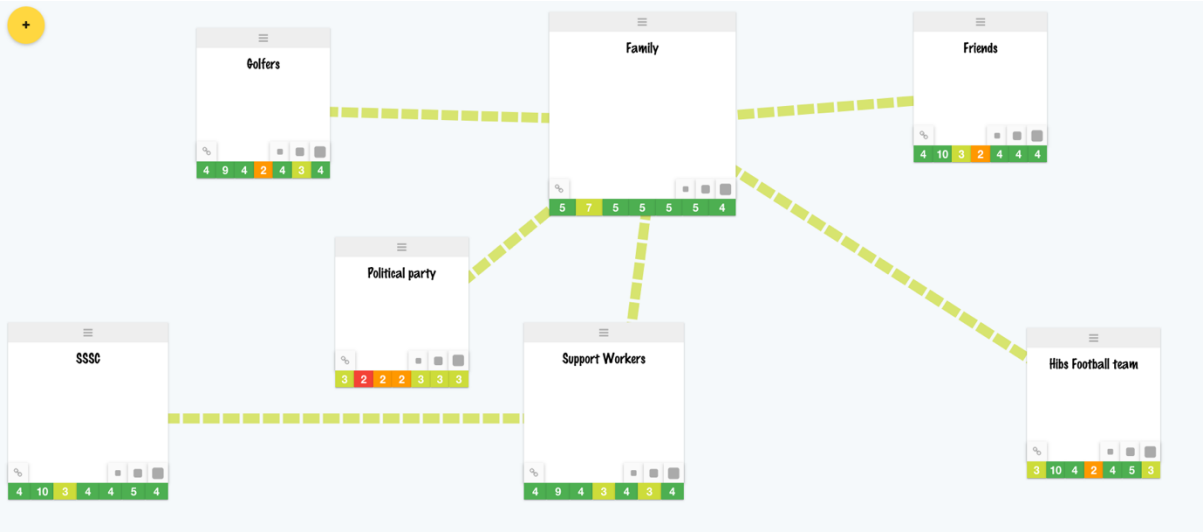
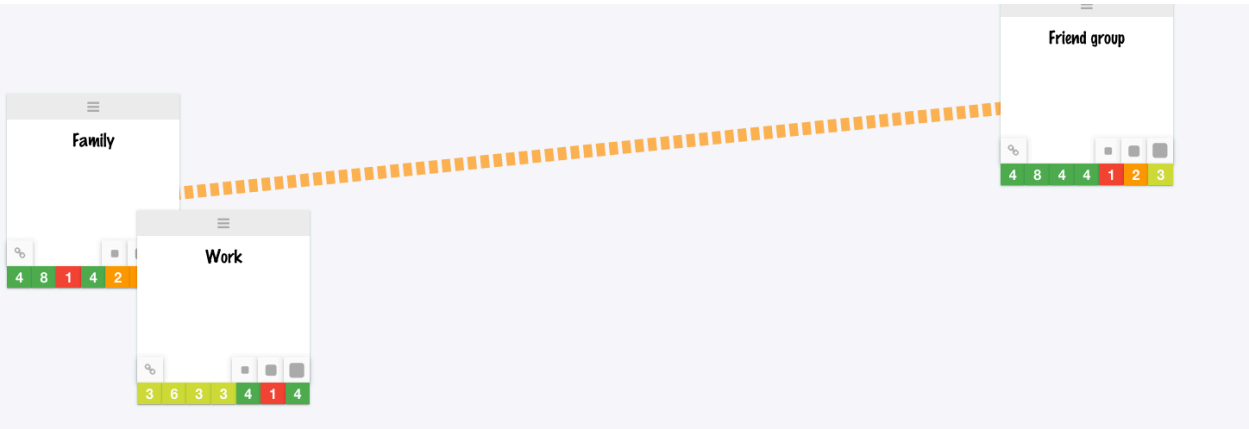


Figure 7

An Example of Participant Map with One Infragroup



Section 2 – Social Identities and Acceptance of Change

Using SPSS, correlation analysis was undertaken with the oSIM measures and the ACS (see Table 15). The more supergroups participants had in their maps (as per aggregated

measures of positivity, support and being representative of the group), the more negative the association with the change seeking dimension in the ACS. Supergroup results were negatively associated with *change seeking*, $r(50) = -.280$, $p < .005$, as was the proportion of supergroups measured against all groups, $r(50) = -.330$, $p < .005$. Participants were asked to rate each group as they created them as either *important* (large size*), medium importance* (medium size) and *less important* (small size). The mean of the less important groups (size of group) and positivity toward groups (identity measure) created by participants, was found to be negatively associated with the *cognitive flexibility* dimension, $r(50) = -.301$, $p < .005$. The mean of representative of groups (identity measure) and the less important groups (measured as size of group) was negatively associated with cognitive flexibility, $r(50) = -.347$, $p < .005$.

Table 15

Correlations of Mapping Measures and Acceptance of Change Scale

Independent variables	Predisposition to change	Support for change	Change seeking	Positive reaction to change	Cognitive flexibility
oSIM: Number of groups	-.070	-.113	-.071	-.114	.044
oSIM: Compatible groups	.060	-.016	-.163	-.064	.021
oSIM: Number of supergroups	.076	-.062	-.280*	-.124	.072
oSIM: Proportion of supergroups	.105	-.081	-.330*	-.062	.002
oSIM: Number of important groups	.054	.024	-.052	-.066	.179
oSIM: Mean of important groups and positivity toward group	.247	.229	-.036	.197	-.218
oSIM: Mean of less important groups and positivity toward group	-.148	.215	-.042	.035	-.301*
oSIM: Mean representative of all groups	.109	.163	.008	.128	-.042
oSIM: Mean representative of not so important groups	-.183	.171	-.057	-.004	-.347*
oSIM: Mean of support all groups	.048	-.013	.067	-.001	-.086
oSIM: Overlap of group membership Complexity	.131	-0.27	.220	.073	-.061
Well-being	-.357*	-.381**	-.078	-.342*	-.237

*$p < .05$. **$p < .01$.

These results were surprising, as we had expected that groups representing important social identities, those groups that people psychologically identity with, would enable people to be more open to change or to be willing to move toward change. Further, we had expected that having psychological resources available, through social identities, would be positively influence change rather than negatively influence the change measures. In fact, *change seeking* and *cognitive flexibility* were the only two dimensions that were correlated with the social identity mapping measures.

Social Identities, Acceptance of Change, and Well-Being

Given the small size of our sample, we could not include all independent variables (listed in Table 15) in a regression. As such, before running the multivariate regression analysis, we selected the independent variables that had significant correlations with at least one of the dependent variables. Statistically significant correlations are marked with asterisks (see Table 15). As a result of the selection procedure, the set of the independent variables included five predictors: number of supergroups, proportion of supergroups, mean of less important groups and positivity toward group, the mean of representative of not so important groups and well-being.

The effects of the independent variables on Predisposition to Change, Support for Change, and Positive Reaction to Change (see Table 16), should be interpreted with caution since in these cases *F* tests are either non-significant or marginally significant. There were two significant effects of the independent variables on cognitive flexibility: the effects of well-being and the proportion of supergroups. Both associations were negative. Well-being also had a significant effect on the dimensions of predisposition to change and support for change - the association was negative (see Table 16).

Table 16

Multivariate Linear Regression Results of Group Measures and Acceptance of Change Scale

Independent variables	*b*	*t*	*p*
Regression Results for Predisposition to Change			
oSIM: Number of supergroups	.03231	.255	.79970
oSIM: Proportion of supergroups	-.12819	-.255	.80010
oSIM: Mean of less important groups and positivity	.09504	.686	.49649
Well-being	-.17660	-2.748	.00867**
oSIM: Mean Representative not so important groups	-.17838	-1.126	.26647
R^2 = 0.1817 $F(5, 44)$ = 1.954 p = .1046			
Regression Results for Support for Change			
oSIM: Number of supergroups	.03209	.249	.80418
oSIM: Proportion of supergroups	-.31783	-.621	.53757
oSIM: Mean of less important groups and positivity	.20603	1.462	.15076
Well-being	-.19228	-2.943	.00517 **
oSIM: Mean Representative not so important groups	-.17911	-1.112	.27227
R^2 =.2148 $F(5, 44)$ = 2.407 p = .05155			
Regression Results for Change Seeking			
oSIM: Number of supergroups	.04425	.244	.808
oSIM: Proportion of supergroups	-1.20000	-1.664	.103
oSIM: Mean of less important groups and positivity	.15313	.771	.445
Well-being	-.09189	-.997	.324
oSIM: Mean Representative not so important groups	-.26598	-1.171	.248
R^2 = .1669 $F(5, 44)$ = 1.763 p = .1405			
Regression Results for Positive Reaction to Change			
oSIM: Number of supergroups	-.12675	-.777	.4413
oSIM: Proportion of supergroups	.11228	.173	.8633
oSIM: Mean of less important groups and positivity	.23310	1.305	.1987
Well-being	-.20634	-2.491	.0166 *
oSIM: Mean Representative not so important groups	-.27550	-1.349	.1843
R^2 = .1667 $F(5, 44)$ = 1.76 p = .141			
Regression results for Cognitive Flexibility			
oSIM: Number of supergroups	.21325	1.634	.1094
oSIM: Proportion of supergroups	-1.06429	-2.051	.0463*
oSIM: Mean of less important groups and positivity	.10300	.721	.4750
Well-being	-.16215	-2.446	.0185*
oSIM: Mean Representative not so important groups	-.28489	-1.743	.0883
R^2 = .2697 $F(5, 44)$ = 3.25 p = .01391			

Note. Significance coded as 0 '***' .001 '**' .01 '*' .05 '.' .1 ' ' 1.

Discussion

This study sought to explore the correlations and associations between the subjective social identities of healthcare professionals and AC. We found no support for Hypothesis 1; the category of group created did not influence AC. We found no support for Hypothesis 2, given that group measures related to the identities such as supergroups and group importance negatively influenced AC. We had expected that more important groups and supergroups would provide greater positivity toward acceptance of change. We also found no support for Hypothesis 3, whereby well-being negatively influenced AC.

Social Identities

While it was assumed that many participants would generate a family group when creating their subjective maps, the sample was selected because they were health professionals working in the UK. The participants were also reminded of this at the outset of the mapping exercise. However, family groups were created the greatest number of times overall across the 171 groups. The COVID-19 lockdown had been in effect for one month at the time of the study, whereby people were limited to staying in their houses or working on the high-risk front line in healthcare if they were healthcare professionals. We wondered if the saliency of family groups was influenced by the lockdown and perceived heightened risks of COVID-19, in which the need to trust in-groups may also have been more present for participants. Cruwys et al. (2020) highlighted in a recent study that group membership structure strongly influences our cognitive (trust) reactions.

In the social identity literature, the criticality of family has largely been studied in relation to major transitions (e.g., diagnosis of a disease). During critical events, family members provide support in order to ensure that people are able to manage the life transition (Barker et al., 2014). The current small number of family identity studies presents an opportunity when researching subjective social identities. The relationship between family identity and other identities could be used to study its influence, at the group and individual level, in relation to particular desired behavioral change. For example, a study explored the spillover effect of gender norms influence upon aspirations related to managing family and professional identities. The results suggested that altering these norms might provide leverage for change so that men and women could combine multiple identities for more enriching lives overall (Meeussen et al., 2016).

Social Identities, Acceptance of Change, and Well-Being

We found that supergroups were significant in relation to AC, whereby there was a negative association between supergroup membership and change. In previous studies, the supergroup index (an indicator of being a member of a supergroup) has been used to predict the capacity people have to make adjustments in relation to life changes across university life, motherhood, and retirement. It was found that such membership assisted people in transition (Bentley et al., 2019). While supergroups have been found to provide a strong supportive psychological mechanism for people, we suggest that the threat to these identities cannot be underestimated if the change is perceived as too threatening or the implications of the change in relation to the group is unknown. A recent study showed that when people were motivated to present a consistent view of self to others, they responded in ways that allowed them to strengthen their association with the threatened identity (White et al., 2018).

While there is a plethora of research that has examined group identification (the subjective sense of belonging to a group) and multiple group memberships, as well as the subsequent benefits to health and well-being of such things (C. Haslam et al., 2018; Jetten et al., 2017), the current study found that the higher the well-being scores were associated with lower scores on AC dimensions results of participants. We tentatively suggest that openness to change may have been perceived as a threat to identity at the self-concept level and was therefore impacted by well-being. Behaviors toward in-group or out-group members is shaped by the norms of our social identities and what we believe is prototypical for the group (Tankard & Paluck, 2016). Perhaps because there were no tangible change impacts outlined, participants could not discern the impacts to themselves and the group, and the phenomena of change may have been interpreted as a challenge to group identification.

A highlight of the study was examining the subjective social identities of the healthcare professionals in relation to an individual positive psychology measure related to change. A limitation of this study was the lower number of participants who completed this study. We would also suggest that the use of the online mapping tool should be explicitly shaped by the context that the research is being undertaken within. For example, only nine participants rated the work group as important. This result suggests that, in workplace change studies, it is important to make professional identities salient and to determine if the influence of family or social norms are required.

Conclusion

Change is a constant process experienced across many dimensions of society. Healthcare professionals, in particular, face many shifts in their professional work as a result of ongoing challenges occurring through environmental health impacts, technology, and globalization. The current findings related to social identities and AC have implications for theory and practice. First, they demonstrate, in line with other social identity research, that certain groups (supergroups) have a key role to play in influencing individual attitudes and behaviors in relation to change seeking, but the direction of those effects depends on variables related to identity salience and perceptions of what is beneficial to oneself and the in-group. This suggests that the importance of various identities in professional settings must also be determined and examined in relation to specific change interventions. A generalized view of change, and a subjective view of multiple social identities, may not give enough direction for designing interventions that seek to address specific change projects or strategies in a professional health setting.

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Chapter 6

Social Identities of UK Healthcare Professionals: The Influence on Group Norms Related to Cannabis and Acceptance of Change

Abstract

The introduction of medical cannabis in the UK is an example of a policy change that impacts healthcare professionals. Relevant issues include the complex dynamics associated with cannabis (e.g., legal status), stigmatization, and increased advocacy from patients (Schlag, 2020). While the health benefits of multiple group membership have been confirmed under the umbrella of work known as the "social cure" – which includes the overarching hypothesis that multiple group membership provides social support and a sense of belonging that results in greater mental and physical health (Jetten et al., 2017) – research related to the social identities of healthcare professional, and their influence on group norms and behaviors during change, is still emerging. The online social identity mapping tool, developed by Bentley, Greenaway, et al. in 2019, allows the subjective assessment of participant social identities. Further to this, the tool enables an understanding of several measures, collected for each of the groups created, and the associations between them. In the present study, we used the online mapping tool to examine 171 groups created by 50 healthcare professionals and how the associated social identity measures influence both the acceptance of change scale (ACS; Di Fabio & Gori, 2016) and group norms related to cannabis. Results showed that the higher the results related to levels of support received from group membership, the more negative the perceived group norms related to cannabis. The higher the score on the overlap of members between groups, the higher the results on the acceptance of change dimension "change seeking." The higher the positivity results toward groups, the more negative the influence on the ACS. These results highlight the effect of social and professional identities on group norms and the criticality of examining these when implementing change in professional healthcare settings.

Introduction

The role and use of cannabis in society has changed substantially over the last 10 years. Today, due to recent research into the medical benefits of cannabis, a significant number of healthcare patients have been not only requesting but also advocating for the use of medical cannabis. This has presented healthcare professionals with several challenges, not least because they may not feel that they have adequate information and knowledge to prescribe effectively (Gardiner et al., 2019). Despite the introduction of legislation in the UK in 2018 that legalized the use of cannabis for medical purposes, there have been mixed views related to current levels of stigmatization towards legalized (and recreational) use of the drug (Carliner et al., 2017; Hand et al., 2016). However, less than a dozen prescriptions for medical cannabis have been written in the UK for a small number of patients since the introduction of the new regulations (Schlag et al., 2020). Problems of knowledge advancement, dissemination, and adequate training are somewhat easy to fix, but issues of social norms and acceptability are harder to navigate. For many healthcare professionals, these dynamics drive their motivation and even their ability to consider new forms of cannabis treatment (Nutt et al., 2020). An understanding of this issue, in light of the various social identities that form part of a healthcare practitioner's working life, was the subject of this study. Examining the social identities of UK healthcare professionals and how these influence group norms related to medical cannabis and acceptance of change (AC) dimensions (Di Fabio & Gori, 2016) can provide data to support patient-centered implementation.

Cannabis

Cannabis is an ancient plant and has been used as a source of fiber, food, oil, and medicine, as well as for recreational and religious purposes, over the centuries and throughout various cultures (Bonini et al., 2018). The social, political, and economic trends of the 1920s and 30s began the transformation of cannabis from a widely prescribed medication to a stigmatized drug (Mead, 2019). Cannabis was illegalized in the UK in 1928 through the Dangerous Drugs Act of 1920, as well as by its listing as a controlled drug under the Misuse Drugs Act of 1971, which made it an offense to possess or supply cannabis in the UK. In 2018, the law changed, and the Home Office became empowered, through the Medicines and Healthcare Products Regulatory Agency, to provide exceptions for particular purposes, such as for medical research, for medical products, or for the growing of industrial hemp (Yeoh, 2020). This special category has been criticized as a factor impeding the uptake of medical cannabis

by healthcare professionals due to resulting bureaucratic processes across a number of levels in the National Health Service (Schlag et al., 2020).

The discovery of the endocannabinoid system (ECS), a cell-signaling system identified in the early 1990s by researchers exploring the psychoactive compounds found in cannabis, provoked investigation beyond the known palliative and recreational uses of the plant (Zou & Kumar, 2018). The ECS is understood to contribute to the maintenance of overall health and well-being due to its homeostatic function (Mecha et al., 2017). Research has also confirmed that the ECS plays a key role in modulating inflammatory states and diseases that are neurodegenerative, gastrointestinal, metabolic, or cardiovascular, as well as in cancer and pain (Navarrete et al., 2020). Ongoing investigation continues into the ECS. Currently, medical cannabis refers to the use of cannabis and its derivatives to treat neoplastic, neurological, metabolic, and inflammatory based diseases (Fonseca et al., 2017; Maroon & Bost, 2018). Significantly, no direct fatalities or overdoses have been attributed to cannabis, even when used recreationally with increasingly potent strains (Maroon & Bost, 2018).

Despite these advancements in medical research, the opinions of healthcare professionals influence the effective implementation of medical cannabis policies. The underlying perceptions of healthcare professionals can range, for example, from cannabis not being part of the biomedical model to being fully accepted and integrated into patient treatments (Zolotov et al., 2018). Furthermore, there has been a lack of consistency across healthcare in relation to the knowledge and use of cannabis (Gardiner et al., 2019). Perhaps because of the perceived lack of published, peer-reviewed evidence demonstrating the role of cannabis as a curative medication, it is still generally viewed as a palliative intervention (Szyliowicz & Hilsenrath, 2019). Specifically, in the UK, it has been suggested that resistance to prescribe has been due to a strong preference for national based research, a vilified drug now being available as a medicine and advanced patient knowledge in comparison to that of healthcare professionals (Nutt et al., 2020).

This mixed role for cannabis has also been heavily influenced by historical stigmatized narratives, differing legal status between countries, states, the role of regulators and the subsequent implications for research investment and healthcare bias (Abuhasira et al., 2018; Naguib & Foss, 2015). Specifically, the differing legal status of cannabis at national and state levels in the United States and in the European Union at central and de-centralized levels (Yeoh, 2020) has impacted the consistency of medical research (Mead, 2019; Schlag et al., 2020). This has resulted in a varied medical evidence base that has had a strong influence upon

the diverse and divergent views of medical professionals in relation to the efficacy and potential of cannabis (Mead, 2019; Sagy et al., 2018).

Cannabis in Its Social Context

Despite the introduction of new medical cannabis policies in various countries over the last 20 years, cannabis stigma has continued to influence the behavior and attitudes of medical cannabis patients (Bottorff et al., 2013; Lucas et al., 2016; Ryan & Sharts-Hopko, 2017) and healthcare professionals (Ryan & Sharts-Hopko, 2017; Schlag, 2020; Zolotov et al., 2018). Cannabis medical research began to re-emerge in the mid-to-late 1990s. Continuing today, this research seeks new areas of use and the confirmation of the positive effectives of medical cannabis as a treatment (Institute of Medicine, 1999). However, the modern history of cannabis as a "drug" that is now available as a "medicine" (Hand et al., 2016) puts pressure on healthcare professionals to navigate the social and cultural factors, particularly stigmas, that influence the variation in views related to cannabis use.

Historically, in the United States, after alcohol prohibition was overturned in 1933, campaigns were designed to associate cannabis use with crime, violence, and psychotic behavior, and this, in turn, became coupled with representations of marginalized or stigmatized groups, particularly racial and ethnic minority groups (Pisanti & Bifulco, 2017). A recent study in the UK related to cannabis use by multiple sclerosis patients outlined the continued stigma and judgment feared by patients that stopped them from sharing their use with community nurses (Daly et al., 2019). Another UK study found that medical cannabis patients attempted to use approaches that reduced their own perceived deviance by shifting the application of stigma to users of other substances (Morris, 2019).

Since Erving Goffman (1963) published his seminal work on stigma, research on stigma has expanded across various fields including healthcare, in which there has been particular focus on the need to move beyond individual-based stigma to address social and structural levels (Stangl et al., 2019). These social levels include areas such as public policy, organizational culture, social norms, and social network attitudes (Stangl et al., 2019). Healthcare professionals are influenced across each of these social and structural levels, and research has shown how norms based on the stigma surrounding cannabis users can be highly influential when it comes to the attitudes and behaviors of health professionals. Research has shown that such behavior can be influenced by stigma towards types of health conditions such as HIV/AIDS (Zarei et al., 2015), obesity (Flint et al., 2017), drug use (Clarke et al., 2015),

and mental health (Knaak et al., 2017). For example, patients with certain mental health challenges, such as personality disorders, were found to be rejected by healthcare staff because they were viewed as "difficult, manipulative, and less deserving of care" (Knaak et al., 2017, p. 11).

Given that stigma is strongly associated with groups and group differences, it is important to consider the impact of these social dynamics when understanding health professionals' attitudes towards medicalized cannabis use. For instance, professional healthcare identities have been shown to have an important influence on group norms and behaviors (Molleman & Rink, 2015; Monrouxe, 2010). A consideration of the various social identities of healthcare professionals provides a theoretical framework from which to assess these dynamics. This level of analysis is particularly important when assessing the rapidly changing state of policy and practice and how a healthcare professional may identify with the various social groups representing these different, and at times controversial, treatments (Graco et al., 2019; Pearse et al., 2020).

Social Identity

Social identity theory presents an understanding of human psychology from the perspective of social affiliations that structure our lives, whether personally or professionally. The often-cited definition is "that part of an individual's self-concept is derived from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership" (Tajfel, 1974, p. 69). Group membership is particularly influential when members share important characteristics such as experiences, interests, and skills. Therefore, the way in which people see themselves is shaped by social identities and the groups to which they belong (Tajfel & Turner, 1979). Individuals belong to numerous groups and self categorization (Turner et al., 1987) occurs at different times, depending on the immediate context and frame of reference.

This process of identification can then influence normative processes (Smyth et al., 2018) and outcomes, such as performance, when a particular social identity is made salient. For example, a nurse walking onto the ward to begin their shift (Rydell & Boucher, 2010; Shih et al., 1999). Further, in-group norms are a more powerful determinant of behavior than out-group norms. Social in-group norms influence beliefs, attitudes, and behaviors of members whereby the process of psychologically belonging to a group aligns members to the in-group norm position (Smith et al., 2007; Smith & Louis, 2008).

Social identity complexity (SIC) examines the types of subjective relationships between social identities and refers to how a person perceives the interrelationships among and between their multiple group identities (Roccas & Brewer, 2002). In the SIC concept, complexity is considered the extent to which people perceive the groups that they belong to as overlapping with similar membership (low SIC) or non-overlapping and dissimilar membership (high SIC). More recent studies have built on SIC theory by moving away from fixed group categories and operationalizing qualitative subjective aspects of social identities (Miller et al., 2009; van Dommelen et al., 2015). Further, studies have shown that those with highly complex identity structures have a higher tolerance for diversity and give less emphasis to conservatism and power values. Other results related to a high SIC have pointed to a greater tolerance for diversity, with less negative explicit and implicit attitudes towards race and ethnicity (Prati et al., 2016).

In social psychology, the last decade has seen the emergence of a body of work focused upon the benefits of multiple social identities contributing to greater physical and mental health outcomes. This research has been framed as "the social cure" (Jetten et al., 2017). Areas of investigation include aging, rehabilitation, exercise, diet, and depression, with research supporting the hypothesis that having multiple social identities is important to well-being. For example, if one identity changes through an event or life transition, an individual is able to draw on other identities (Steffens, Jetten, et al., 2016) The reason why group membership has curative properties is still emerging; however, it appears that groups provide people with a sense of belonging, social support, and feelings of efficacy (Kyprianides et al., 2019).

Social support is deemed as present in relationships that are reciprocal, accessible, and reliable and provides any or a combination of supportive resources (Lindsay Smith et al., 2017). It is also differentiated into both actual support (support received) and perceived support (believing it will be given if required). The differences between actual and perceived social support benefits are understood as minimal (Jones & Jetten, 2011). There has been a steady focus in the literature on the social support offered through social ties, specifically through multiple identities, providing a pathway to gain social support and positively influencing individual well-being (Häusser et al., 2020; Steffens, Jetten, et al., 2016; Walter et al., 2016).

Social Identities and Change

The value of social identities across group measures such as importance, positivity, and support have been used to forecast the capacity of individuals to adapt when changes in life

occur (e.g., entering university, becoming a mother, and retirement; Bentley, Peters, et al., 2019). In previous studies, groups that were rated highly on these measures were found to provide a strong psychological support mechanism to people during times of transition. (Bentley, Peters, et al., 2019). The implications of successful or failed change initiatives have far reaching impacts at both the personal and collective level. Across psychology, resistance to change is considered predictable and a key factor to overcome when introducing change, such as in organizational (Murrar & Brauer, 2019), environmental (Hanus et al., 2018), and health settings (Jones & Van de Ven, 2016). Social identities have been found to influence divergent thinking (Gaither et al., 2020), creativity (Steffens, Gocłowska, et al., 2016), and change (Slater et al., 2016).

Therefore, extending the research to examine the relationship between social identities and AC is a key aspect of this study. In response to resistance to change research, the study of AC, such as that undertaken by Di Fabio and Gori (2016), emerged from positive psychology. Rather than demonstrating resistance, the focus was determining how people could deal constructively with change and the resultant improved quality of life, well-being, and societal benefits.

Social Identities and Cannabis

While the health benefits of multiple group membership have been confirmed across numerous studies (Kyprianides et al., 2019), the study of the social identities of healthcare professionals themselves is still developing. Professional identity, a form of social identity, depicts a process of comparison and differentiation between the self, as a member of one profession, and members of other professions (Turner et al., 1987). Professional identity is understood as critical in the formation of appropriate professional behaviors in healthcare (Burford, 2012; Cascón-Pereira & Hallier, 2012; Chan et al., 2018).

One study undertaken in a multidisciplinary healthcare setting found that some professional identities were more flexible and that, in times of stress, differences were more evident across the different professional disciplines within the team. This appeared to be based on time related to socialization processes of each identity (Cain et al., 2018). Another study established that professional identity salience can both enhance and undermine multidisciplinary team innovation, depending on the extent of team open-mindedness (Mitchell & Boyle, 2015). Nurses that were more identified with their professional identity were found

to be more influenced by in-group norms related to renewing flu vaccines (Falomir-Pichastor et al., 2009).

The interaction of a person's various social identities with their associated group norms, and whether they are experienced as conflictual or enabling, has yielded mixed results in the literature depending on the context and salience of specific identities (Bentley, Peters, et al., 2019; Sønderlund et al., 2017; Wakefield et al., 2019). A previous scoping review of research focused upon the knowledge, attitudes, and behaviors of healthcare professionals, in relation to cannabis, revealed that professional identities and their associated group norms were not considered in any of the studies. However, it was shown that work-based experiences with specific treatments and subsequent beliefs related to appropriateness of cannabis-based treatments did influence the results across the various studies reviewed (O'Rourke et al., 2020). This suggests that as exposure to cannabis use within the medical field increases, so too does acceptance of it.

Therefore, in this exploratory study of a cohort of UK healthcare professionals, we focused on the subjective social identities and the associated group measures. We also included the SIC aspect of group member overlap and the influence on group norms related to cannabis. The online social identity mapping (oSIM; Bentley, Greenaway et al., 2019) tool enabled us to capture the social identity maps of participants, the importance given to each group created, and a measure of associated group support and positivity. We also used the acceptance of change scale (ACS; Di Fabio & Gori, 2016) to measure the relationship between five dimensions of change and participant social identities.

The Present Study

The subjective groups created by participants in this study provided the basis for examining the social identities of UK healthcare professionals, the relationship between identities, group norms related to medical cannabis, and AC. In this context, the online mapping tool developed by Bentley, Greenaway, et al. in 2019 was used in this exploratory study.

The aim of the study was to examine how the social identities of healthcare professionals influenced group norms related to medical cannabis and AC, specifically:

1. How does group positivity influence group norms related to cannabis and AC?
2. How does group support influence group norms related to cannabis and AC?
3. How does group complexity influence AC?

Expectations

Given the historical and current stigma surrounding cannabis users, we expected the higher the importance of the group to participants in terms of positivity toward and support from the group, the more positive the influence on group norms related to cannabis (Hypothesis 1). The levels of perceived support and positivity toward groups was expected to positively influence AC (Hypothesis 2). Drawing on previous research in identity complexity (Miller et al., 2009), we expected higher complexity as reflected in less overlap of in-group members to positively influence AC (Hypothesis 3).

Method

We used oSIM software to collect data from healthcare professionals working in the National Health Service in the UK. We used Prolific (https://www.prolific.co) to source the participants.

Participants

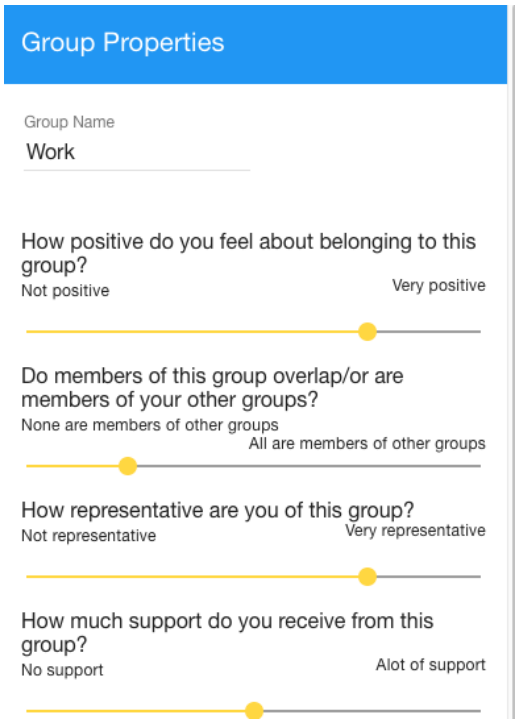
Our study included 50 healthcare professionals from the UK. The first task within their participation was to create an online map of their social groups and respond to questions about each of these groups. For the present study, we then took the first four groups created by each participant and worked with the 171 groups created overall as our dataset. The proposed interpretation has limitations since the results can be also explained by the correlations between the repeated measures.

Procedures

In order to build their social identity maps using oSIM software, participants were guided through the interactive process. Participants created and named their groups, assigned importance to each group, and responded to questions about each group and the compatibility between groups (see Figure 8 as an example).

Figure 8

An Example of Group Measure Questions in the Mapping



Measures

Group Measures

Participants were able to create a visual representation of their group memberships and include assessment of their group memberships. This method of social identity mapping was born out of applied settings (Cruwys et al., 2016). The online version oSIM enabled the collection of data related to the quality and quantity of groups and the importance and compatibility between groups. For each group created, we used a 5-point Likert scale to measure the following aspects: (a) its importance to the individual, (b) the support received, (c) the positivity toward each group and (d) the prototypical level of membership. This procedure followed that proposed by Bentley, Greenaway, et al. (2019).

Identity-complexity overlap data was also captured through the mapping process. This meant that, for each group created, a question was asked about that group in relation to the number of members of that group and its potential overlap with other groups. This ranged from 1 (*none are members of other groups*) to 10 (*many are members of other groups*).

Cannabis and Group Norms

We measured group norms related to cannabis. Using a 5-point Likert scale for each question, we asked the following for each of the groups that participants created on their maps.

1. Would members of this group recommend cannabis?
2. Would members of this group investigate information about cannabis?

We also measured the perceived distance to the norm related to cannabis, using a 5-point Likert scale.

1. Do you believe you are aligned with this group, and their views, related to cannabis?

Acceptance of Change Scale (ACS)

This is a self-report measure that assesses the tendency of individuals to accept or move toward change (Di Fabio & Gori, 2016). The ACS uses a 5-point Likert scale (1 = *not at all*, 2 = *a little*, 3 = *somewhat*, 4 = *much*, 5 = *a great deal*) across five different dimensions. The measure consists of 20 items across five dimensions (see Table 17).

Table 17

Dimensions of Acceptance of Change Scale and Questions

Dimension of scale	Example of question from each dimension
Predisposition to change	"I easily identity alternative paths."
Support for change	"I can compare myself with other people important to me when facing change."
Change seeking	"I am looking for changes in my life, even when things are going well."
Positive reaction to change	"I am able to tolerate even the negative aspects of change."
Cognitive flexibility	"It's easy for me to change my mind when I realize that I am wrong."

Results

In the first section, the demographics of the participants were analyzed (Table 18). We then determined if there were any correlations across group categories, identity measures, acceptance of change and the influence on group norms towards cannabis (see Table 19). Given that we were working with multiple independent and dependent variables, we then used multivariate regression analysis, across the social identity group measures, on group norms related to cannabis and AC.

Table 18

Participant Demographics and Health Disciplines

Demographics	Results
Number of Participants	50
Mean Age	45
Gender	44 f, 6 m
>20 years of experience	38%
<20 years of experience	62%
Professional Group Membership of Participants	
Clinical practice	9%
General Practice	8%
Nursing	39%
Pharmaceutical	12%
Paramedic	2%
Community Health	8%
Health Administration	14%
Health Research	2%

Table 19

Mean, Standard Deviations, and Correlations

	Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Category coded	0.64	0.48													
2	Importance of group	2.06	0.83	.17*												
3	Support from group	3.81	1.14	.12	.46**											
4	Positivity toward group	4.38	0.73	.23**	.50**	.59**										
5	Representative/Protoypical	3.85	0.98	.16*	.37**	.54**	.58*									
6	Complexity overlap of groups	4.07	2.77	.03	.12	.23**	.11	.14								
7	Cannabis Investigate	3.04	1.38	-.08	.12	-.10	.05	.07	.10							
8	Cannabis Aligned	3.39	1.12	-.03	.15	.14	.09	.17*	-.04	.21**						
9	Cannabis Recommend	2.76	1.31	.03	.04	-.08	.01	.01	.03	.71**	.18*					
10	Predisposition for change	3.63	0.62	-.00	.02	.01	.15	.07	.10	.22**	.05	.09				
11	Support for change	3.50	0.64	-.03	.03	.02	.14	.10	-.02	.13	.05	.00	.47**			
12	Change Seeking	2.57	0.88	-.03	-.02	.07	.01	.02	.22*	-.10	-.23**	-.10	.27**	.27**		
13	Positivity toward change	3.15	0.79	-.02	-.03	.00	.16*	.09	.07	.17*	.03	.05	.65**	.68**	.34**	
14	Cognitive Flexibility	3.42	0.68	.03	.09	-.03	-.09	.02	-.03	.06	.07	.13	.40**	.21**	.46**	.32**

* $p < .05$, ** $p < .01$.

Group Norms and Cannabis

We selected the variables that measured group membership responses related to positivity toward group, support from group, representative of group, and complexity overlap of group members. We conducted multivariate multiple linear regression since we not only have several independent variables but several dependent variables as well. Type II MANOVA Tests: Pillai Test Statistic is used in multivariate regression to test if there is any effect of each of the independent variables on all dependent variables, or a weighted linear combination of the dependent variables, or a group of dependent variables as a whole.

We have four independent variables (support from group, positivity toward group, representative of group, and complexity overlap of group) and three dependent variables (cannabis investigate, cannabis aligned, and cannabis recommend). We found only one significant effect of the independent variables on the dependent ones when considering them separately (it was effect of support from groups on cannabis investigate; other relationships were nonsignificant):

We then undertook multivariate regression analysis to determine the effects of the group measures on group norms related to cannabis (see Table 20). Given that we were working with the number of groups created by participants, we had the necessary sample size of 171 groups for five predictors.

Table 20

Multivariate Regression Results for Support from Group and Cannabis Investigate

Independent variables	*B*	*t*	*p*
oSIM: Importance of Group	0.27171	1.774	.078121
oSIM:Support from Group	-0.34246	-2.692	.007893 **
oSIM:Positivity toward Group	0.08602	0.411	.681626
oSIM:Representative/Protoypical of Group	0.13112	0.935	.351128
oSIM: Complexity Overlap of Groups	0.05567	1.385	.168111

R^2 = 0.03141
$F(5, 152)$ = 2.018
p = .7913

Note. Significance coded as 0 '***' .001 '**' .01 '*' .05 '.' .1 ' ' 1.

The results showed that a higher score related to group support was associated with a negative response to the statement "members of this group are open to investigating cannabis" (see Table 21).This result should be interpreted with caution since in these cases *F* tests are

either non-significant or marginally significant There was a significant effect of support from group measure on group norms as a whole related to cannabis (see Table 21).

Table 21

Type II MANOVA Tests: Pillai Test Statistic

Independent variables	test stat	approx F	*p*
oSIM: Importance of Group	.025871	1.3279	.26748
oSIM: Support from Group	.060513	3.2205	.02448 *
oSIM:Positivity toward Group	.006949	0.3499	.78928
oSIM: Representative/Prototypical of Group	.019059	0.9715	.40793
oSIM: Complexity Overlap of Groups	.028363	1.4595	.22794

Note. Significance coded as 0 '***' .001 '**' .01 '*' .05 '.' .1 ' ' 1.

Group Measures and Acceptance of Change

Taking the five dimensions of the ACS, we then ran multivariate regression analysis using the social identity group measures (see Table 22). The results show that positivity toward group is significantly and positively associated with predisposition to change and positive reaction to change. Also, there is a marginally significant and positive association of positivity with support for change. At the same time, positivity is negatively and significantly related to cognitive flexibility. Complexity overlap is positively and significantly related to change seeking. Also, there is a marginally significant positive association of importance of group with cognitive flexibility. The above effects should be interpreted with caution since in these cases *F* tests are either non-significant or marginally significant (see Table 22).

Table 22

Multivariate Regression Results for Group Measures and Acceptance of Change Scale

Independent variables	*B*	*T*	*p*
Regression Results for Positivity toward group and Predisposition to Change			
oSIM: Importance of Group	-0.030093	-0.422	.674
oSIM:Support from Group	-0.080631	-1.364	.174
oSIM:Positivity toward Group	0.205428	2.152	.033 *
oSIM:Representative/Protoypical of Group	0.009049	0.139	.890
oSIM: Complexity Overlap of Groups	0.026448	1.429	.155
R^2 = 0.01536 F(5, 157) = 1.505 p = .1911			
Regression Results for Positivity toward Group and Support for Change			
oSIM: Importance of Group	-.020098	-0.277	.7824
oSIM:Support from Group	-0.063717	-1.058	.2917
oSIM:Positivity toward Group	0.166092	1.707	.0898
oSIM:Representative/Protoypical of Group	0.043725	0.657	.5122
oSIM: Complexity Overlap of Groups	-0.003425	-0.182	.8561
R^2 = 0.0001235 F(5, 157) = 1.004 p = .4173			
Regression Results for Positivity Toward Group and Positive Reaction to Change			
oSIM: Importance of Group	-0.10910	0.09082	.2315
oSIM:Support from Group	-0.10923	-1.451	.1488
oSIM:Positivity toward Group	0.30934	2.543	.0119*
oSIM:Representative/Protoypical of Group	0.04563	0.548	.5843
oSIM: Complexity Overlap of Groups	0.02371	1.006	.3160
R^2 = 0.2871 F(5, 157) = 1.958 p = .08785			
Regression Results for Positive Toward Group, Importance of Group and Cognitive Flexibility			
oSIM: Importance of Group	0.139343	1,781	0,0768
oSIM:Support from Group	-0.009291	-0,143	0,08863
oSIM:Positivity toward Group	-0.211173	-2.016	0.0455*
oSIM:Representative/Protoypical of Group	0.064978	0.907	0,03660
oSIM: Complexity Overlap of Groups	-0,009267	-0,456	0,6487
R^2 = 0.2871 F(5, 157) = 1.958 p = .0875			
Regression Results for Complexity Overlap of Groups and Change Seeking			
oSIM: Importance of Group	-0.082120	-0.830	.40773
oSIM:Support from Group	0.061951	0.755	.45115
oSIM:Positivity toward Group	-0.039486	-0.298	.76604
oSIM:Representative/Protoypical of Group	-0.009656	-0.107	.91530
oSIM: Complexity Overlap of Groups	0.069896	2.722	.00721**
R^2 = 0.2554 F(5, 157) = 1.849 p = .1063			

Note. Significance coded as 0 '***' .001 '**' .01 '*' .05 '.' .1 ' ' 1.

There was a significant and positive effect of complexity overlap of groups on the change seeking dimension. In other words, the higher the score on the overlap of group members, the higher the AC dimension scores. Results of Pillai test showed that positivity toward group and complexity overlap were the significant predictors of AC as a whole. There was also a marginally significant effect of the importance of group measure (see Table 23).

Table 23

Type II MANOVA Tests: Pillai Test Statistic

Independent variables	test stat	approx F	*p*
oSIM: Importance of Group	.067519	2.2157	.055504
oSIM: Support from Group	.028328	0.8921	.488005
oSIM:Positivity toward Group	.118072	4.0967	0.001612**
oSIM: Representative/Prototypical of Group	.012810	0.3971	.850279
oSIM: Complexity Overlap of Groups	.103719	3.5411	.004662**

Note. Significance coded as 0 '***' .001 '**' .01 '*' .05 '.' .1 ' ' 1.

Discussion

In the current study we examined the subjective social identities of UK healthcare professionals and sought to determine their influence on group norms related to cannabis and AC. We found no support for Hypothesis 1 related to the support of the group and the influence on group norms related to cannabis. The perceived level of support received through group membership negatively influenced whether participants reported the group as being open to investigating cannabis; in other words, the more support people felt from their groups, the less open they believed the group would be to investigating cannabis. We found some support for Hypothesis 2; measures related to positivity toward group and importance of group were found to positively influence AC dimensions. We found no support for Hypothesis 3. Higher overlap of group memberships (less identity complexity) was found to positively effect the specific "change-seeking" dimension of AC. Higher overlap of group membership (less identity complexity) and positivity toward group were the significant predicators of AC dimensions overall.

Undertaking analysis of the subjective social identities and measures associated with social identity related to group membership revealed specific effects across group norms related to cannabis and AC dimensions. Specifically, every dimension of AC was influenced by an aspect of group membership. These results point to the importance of perceived

experience of group members in terms of the quality of what is subjectively received through group membership, not just the size and categories of group membership. This result is supported by earlier research; for example, a recent study examined the relationship between individual identification and individually perceived group identification. The findings suggest that positive effects were explained by individual-level processes of appraising both the stressors and resources of membership rather than group-based behavior (Häusser et al., 2020). In the current study, positivity toward the group had a significant influence on the AC dimensions.

Several studies have explored identity complexity through the overlap of in-group memberships and effects on dimensions of cultural and religious diversity, trust, and acceptance (van Dommelen et al., 2015; Xin et al., 2016). We were particularly interested in the overlap of group membership and its influence on the AC dimensions. We found higher complexity overlap scores of group members were suggestive of lower identity complexity and were positively associated with AC, specifically the change-seeking dimension. According to Di Fabio and Gori (2016), change seeking is a critical aspect of AC. Individuals with a high level of AC seek novelty, resulting in the capacity to integrate and accept work and life changes initiated externally to themselves. Studies have also suggested that multiple identities enable creative thought through individual knowledge and experience associated with feeling connected to multiple groups (Gocłowska & Crisp, 2014; Steffens, Gocłowska, et al., 2016).

Individuals with low SIC reported their in-groups as highly overlapping, and those with high complexity reported their in-groups as distinct with minimal overlap in membership (Roccas & Brewer, 2002). Further, individuals with higher identity complexity have demonstrated more openness to people from out-groups, specifically different cultural and religious groups (Brewer & Pierce, 2005; Schmid et al., 2013). The results related to higher complexity overlap of group membership in the current study may point to the well-researched benefits of multiple group membership, particularly in times of transition or change in which a greater number of social identities assist the individual through the provision of wider options for support, belonging, and positivity. This becomes particularly important when change results in an impact on one identity, such as during retirement when the professional identity is no longer available to access (Jones & Jetten, 2011; Steffens, Jetten, et al., 2016).

We found that complexity overlap of group membership and positivity toward group were the significant predictors of AC overall. In this way, the findings revealed that implications of social identities extend the domain of change and open up future investigation

that could examine the quality and interconnection of multiple identities in applied professional healthcare settings.

A highlight and unique aspect of the study was investigating the interaction of the social identities, AC dimensions, and group norms related to attitudes towards cannabis among healthcare professionals. A limitation was the number of participants in the study, whereby we were able to work with 171 groups that they created but were unable to analyze differences across categories of group (i.e., specific professional disciplines). Future research opportunities lie in determining the quality and interaction of group memberships in relation to specific change initiatives or stigmatized areas in applied healthcare settings. Specifically, the influence of the social settings on the perceived quality of the experience of various professional identities and how this influences change processes and implementation of new policies and clinical practices. Comparing and contrasting patient identity measures would also yield useful results and allow the potential to bridge gaps between the two.

Conclusion

Social identities, their interaction, and resulting benefits and challenges is a dynamic and emerging area of research. The "social cure" body of work has advanced understanding of the various ways that belonging to multiple groups is positive and indeed central to well-being. Research has also extended these findings related to well-being to the influence of the social environment on various social identities – specifically, the interaction between identities and how individuals are influenced by normative conflicts or opportunities, such as creativity, that multiple group membership provides. The introduction of medical cannabis is an example of a policy change that impacts healthcare professionals through potentially complex legal and social dynamics. It is one of many examples of change experienced by healthcare professionals as health systems worldwide contend with rapid social, economic, and technological shifts. Examining social identities and the corresponding group measures, as well as their interaction in professional healthcare settings, can better support patient-centered education and change interventions.

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Chapter 7

General Discussion

The present dissertation aimed to examine how healthcare professionals are influenced by social identity processes and group norms in relation to recommending cannabis to patients. While this research is about the influence of both belonging to and identifying with various groups in professional health settings (i.e., the group level of analysis; Doise, 1980), there were three key areas that were considered to determine the broader contextual factors that contribute to the healthcare professional group influences in relation to cannabis. First, the current escalating environmental and social factors that influence healthcare systems at global and local levels. Second, the stigmatized history of cannabis and the change presently occurring with cannabis across scientific, legal, and social status, in particular as an emerging medicine in healthcare. Third, the relentless amount of change occurring within health systems as a result of the environmental, technological, and political shifts and how this has been managed. Broadly, resistance to change across various disciplines is now expected when change is introduced.

In this section, the objectives of this thesis are revisited along with the key elements that were considered in developing the research. The findings are then interpreted overall, emphasizing the theoretical and applied implications of this work. The limitations of these studies are then outlined with suggested future directions for research and, finally, concluding comments are offered.

The intersecting challenges across health, diet, and environment are now considered a global syndemic, wherein several factors interactively contribute to excess morbidity and mortality (Swinburn et al., 2019). Because of the synergistic nature of these challenges, collective-based interventions related to behaviors are required to bring about timely and systemic impacts for mitigating the crises (Schlüter et al., 2017). Amidst these challenges, technology, globalization, and increased demands from patients also influence healthcare professionals as they adapt to the associated myriad of change in their workplaces.

Cannabis-based medicine is an example of a change occurring today in healthcare. Historically used as food, fiber, and drug (Bonini et al., 2018), cannabis has gained renewed interest in medicine since the discovery of the endocannabinoid system of the human body in the early 90s (Piomelli et al., 2017). This historically stigmatized “drug” is now being used as a “medicine” (Pisanti & Bifulco, 2017). Various countries have introduced laws and agendas allowing the use of cannabis by patients for symptoms such as spasticity or pain (Whiting et al., 2015). Healthcare professionals, already facing multiple changes in health systems, have found themselves at the intersection of health policy, patient demand, and organizational policies and practices in navigating the implementation of medical cannabis. Given conflicting

laws, historical stigmatization of cannabis, lack of evidence-based research, and increased patient advocacy for cannabis use, these changes in policy toward cannabis have been challenging for healthcare professionals (Schlag et al., 2020).

As a result of the various organizational, clinical, or process changes that occur, healthcare professionals can experience threats and challenges to their professional identities in the workplace (Korica & Molloy, 2010). The resulting behaviors of healthcare professionals, caused by these threats to identity, can be to undermine or resist the planned changes. More broadly, in relation to health and pro-environmental behaviors, research has also shown that identity threat predicts resistance to change (Feygina et al., 2010; Murtagh et al., 2012; Nilsen et al., 2016). Professional identity formation is considered foundational in healthcare training for guiding appropriate group norms of healthcare professionals. Therefore, given the rate of change occurring in healthcare, professional identities must be considered if change implementation is to be successful (Johnson et al., 2016; Walsh et al., 2018).

Resistance to change is considered to be both predictable and a challenge to overcome across various disciplines such as environmental (Hanus et al., 2018), organizational (Murrar & Brauer, 2019), and health psychology (S. L. Jones & Van de Ven, 2016). The study of change has been dominated by the influence of resistance to proposed changes and identity threat when change is introduced. However, Di Fabio and Gori (2016) introduced the acceptance of change scale. The development of this approach to change in positive psychology was guided by an interest in discovering constructive approaches for dealing with change that would improve quality of life and well-being, rather than just demonstrating resistance.

In the current research, we examined how healthcare professionals are influenced by social identity processes and group norms in relation to recommending cannabis to patients. While we studied the levels of identification with professional groups and associated group norms related to cannabis, we were also able to measure the acceptance of change of social identities and associated subjective identity measures more broadly. This interaction of acceptance of change, social identity processes, and group norms in relation to cannabis reflects the complex, challenging, and rapidly changing environments that healthcare professionals operate within at their places of work.

Interpretation of Findings

This thesis focused on group level of analysis (Doise, 1980), and subsequent interventions, when working with professional groups in healthcare−specifically, the influence

of social identities within healthcare settings. The importance of group and collective approaches to behavior was amplified after conducting a literature review of the current and future behavioral challenges across health, diet, and environment (Chapter 2). We determined that, given its multiple uses, cannabis is an example of a plant that can be used to combat elements of what is now understood as a global syndemic (Swinburn et al., 2019). However, the history of cannabis has resulted in it currently being viewed in different ways, for example, stigmatized as a drug or revered as an ancient plant (Bonini et al., 2018), and the perspective taken toward cannabis depends on the social groups involved. These social influences are present in the medical implementation of cannabis and effectiveness across healthcare disciplines and the policies of nations (Bifulco & Pisanti, 2015). Further, when attempting to change behaviors amidst a syndemic that has a profound impact upon health, taking a group-based or collective approach has been increasingly seen as a requirement for timely mitigation (Lede et al., 2019; Shove, 2010). For example, in relation to the introduction of medical cannabis, the social and professional identities of the groups involved, and their norms, must be understood in order to bring about behavior change (Roberts, 2020).

We then undertook a scoping review, using the theoretical domains framework (TDF; Cane et al., 2012), to identify research gaps related to the attitudes and behaviors of healthcare professionals and medical cannabis (Chapter 4). We found that the behavioral theory underpinning the studies, and the subsequent explanatory factors of their results, was poorly theorized. There were various professional groups identified in the studies, but no attention was given to the social influences impacting the behaviors and views of the participants. Further, although research has examined the influences of professional identities on group norms in healthcare related to other change interventions, there was a distinct gap in the literature related to medical cannabis and a particular lack of focus given to social influences such as professional identities. This review also confirmed the importance of the use of behavioral models to enable analysis of the underlying societal and professional norms of groups involved in change, as well as support the design of interventions that address the enablers of, or barriers to, change.

As a result of the findings from the scoping review, we developed a quantitative study to examine the influence of social identity processes on healthcare professionals in the UK in relation to recommending cannabis (Chapter 4). We found that the personal attitudes toward medical use of those who recommended cannabis to family or friends was more positive than of those who did not. Participants who highly identified with their professional groups scored more positively on their perception of the group norm of medical use. The use of education

resources related to cannabis was also found to mediate the association between identification and perceived group norms of medical use. In line with the "social cure" body of work that outlines important group membership as beneficial to health and well-being, a higher identification with the professional group resulted in participants being happier and more satisfied with their life (Jetten et al., 2017).

Using new online social identity mapping software (Bentley et al., 2019), we developed a study to examine subjective social identities of UK healthcare professionals and the relationship with acceptance of change dimensions (Di Fabio & Gori, 2016; Chapter 5). In this study, we focused on the acceptance of change dimensions only. This was important given that cannabis represents a significant change in healthcare treatments in the UK and that the extent that social identity measures influenced change seeking provided useful information generally related to change, social identities, and healthcare professionals.

Using the same sample of participants as in the previous study (Chapter 4), this study was undertaken during COVID-19 and, perhaps because of the related work and life restrictions, had higher rates of non-participation. Our analysis found that the family group dominated the results in terms of the social identity categories created and rated as important by participants. This family group saliency may have also been influenced by COVID-19 conditions whereby healthcare professionals were either working on the front line in healthcare or confined to working or being at home and focused on keeping family members safe.

We had expected that, due to greater psychological strength over time through membership of groups that were important as social identities, participants would be more open to change or be more willing to move toward change. However, supergroups, as per aggregated measures of positivity, support, and being representative of the group (Bentley et al., 2019), were found to be negatively linked with the change-seeking dimension in the five-dimensional acceptance of change scale. The change-seeking dimension measures the desire to make changes in routines and life regardless of what is occurring.

The final study focused on subjective social identities, created by the participating UK healthcare professionals, and the corresponding group quality measures, including positivity toward group and perceived support of the group (Chapter 6). This study showed that the higher the results of support received from the group, the more negative the results related to the group norm of members being considered open to investigating cannabis as a treatment. This result suggested that if healthcare professionals were not open to investigating cannabis as a treatment, recommending cannabis to interested patients would potentially be problematic.

Further, this result suggested that moving toward investigating cannabis may put perceived support from group membership at risk.

The positivity toward group measure had a significant and positive effect on predisposition to change, support for change, and positive reaction to change dimensions. Further, the overlap of group membership results positively influenced the change-seeking dimension. While the "social cure" literature has confirmed that a greater number of social identities during transitions enable well-being, our findings have implications in professional settings related to change processes. The results point to the importance of moving beyond the number and category of groups to examine the experience of group membership through social identity measures and their effects on behavior, particularly when introducing change.

Theoretical and Applied Implications of the Present Findings

Theoretically, social identity theory (SIT) has emerged into a very broad subject area and has been used to explore many aspects of human functioning, including social processes within and between groups (Hogg et al., 2017), discrimination (Prati et al., 2016), health and well-being (Jetten et al., 2014; Stevens et al., 2017), leadership and management (A. D. Brown, 2015), environmental management (Bamberg et al., 2015), and social change (Bond & Seneque, 2012; Dono et al., 2010). While a broad approach to SIT has orientated researchers to social identity, and therefore group phenomena as a key driver of human behavior, a lack of specific hypothesis development derived from SIT has been criticized (R. Brown, 2019). There have also been calls to differentiate the effects of social identities based on group-level processes and individual-level processes (Häusser et al., 2020), as well as their interaction to design more specific interventions in applied settings. In this research, we were able to be specific about the group-level processes in relation to the individuals in the context of the challenging UK healthcare environment and the introduction of a change, explicitly a controversial change such as cannabis-based medicine.

Our findings suggest that while specific hypothesis development is useful to guide the measurement of certain social influences, such as professional identification and group norms (Chapter 4), there are other domains that can be considered for a comprehensive overview of influences on the group. For example, the social context that groups inhabit can be considered and, where possible, a historical understanding gained of the influences that may have shaped the norms of those identities (Kyratsis et al., 2017). Further, locating the groups in professional or organizational contexts may provide direction in determining particular social influences

that might be occurring in those environments. In the analysis, distinguishing organizational level identification, professional identities, and work team identities (Willetts & Clarke, 2014) will provide different insights into approaches to change processes or the implementation of new approaches to work (Guo et al., 2019). Belonging to groups, through organizational or social structures, and being identified with groups are two different dimensions that need to be considered it order to determine how identified people are with groups in the workplace and the subsequent influence of the groups and their social norms.

The interaction of the different social identities of a person (J. M. Jones & Hynie, 2017; Steffens et al., 2016) has also been a developing area under the theoretical umbrella of SIT. This has been reflected in the subjective creation of identity maps (Bentley et al., 2019). This subjective identity mapping allows the exploration and measurement of different aspects of the social identities of a person or group. Online mapping was designed to move beyond self-report measures of the validated scales that measure self-categorization of a limited number of pre-determined groups. The use of the mapping in the current thesis allowed the innovative extension of the software to develop the subjective social identities of the UK healthcare professionals and the influence of the associated measures on acceptance of change and group norms related to cannabis. This use of the mapping tool points to being able to design studies in applied settings that can identify the influence of professional, social, or family groups by identity measures and group norms related to the object of the study, such as responses to specific change interventions.

In this research, we found that the subjective mapping of social identities revealed a dominance of the family group as the most important group. At the same time, it showed the potential for research that examines the connection of family norms with other important groups (Chapter 5). Interestingly, given the boundaries between work and life have been somewhat eroded during COVID-19, this may be increasingly important in the future in terms of the interaction or relationship between group and social norms. This study also pointed to the potential strength of supergroup links to the other measures being examined in relation to social identities. When supergroups are present, they can have a significant influence on other measures being examined, such as change seeking or group norms.

Given the professional identities present within a workplace setting such as those found within a healthcare team, the benefits of group-level analysis, in its ability to effectively explore group norms and change, is a key outcome of the current research. It is important to evaluate the groups that professionals inhabit and to make links to the environmental and social influences that shape these groups. Suggesting that levels of knowledge or available

information is the key determinant for successful change interventions was found to be a limitation of studies in our scoping review (Chapter 3). This thesis points to the importance of identifying the group norms and related identity measures of important social identities of healthcare professionals, beyond measuring knowledge, when implementing change.

As was found within our study, the norms of supergroups can override the norms of less important groups. Therefore, it is important that future studies are able to identify groups as either a superordinate or supergroup when examining social identities (Chapters 4 and 5). Further, professionals may adhere to group norms that are generative, destructive, or both simultaneously, to themselves and their organizations. As such, determining the groups that professionals are identified with in organizational settings is useful for research areas including well-being and change processes (Wakefield et al., 2019).

We discovered that, while there is a vast body of research examining social identities and their influence on health and well-being ("the social cure"; Haslam et al., 2018), it is largely focused on the recipients of healthcare or bringing about behavior change related to lifestyle factors in other societal groups. The basic tenet is that the more social identities or group membership a person has, the better their health and well-being, largely due to perceived or actual social support. While more research is emerging related to both the benefits and challenges of a person's different identities, depending on the context, there have been very few studies that examine the influence of professional identities on healthcare workers or their views related to social influences and health.

This research had a number of innovative features. The first emerged from identifying that there was a gap in previous studies related to healthcare professionals' knowledge, attitude, and behaviors being influenced by social identity processes. Given that the introduction of cannabis-based medicine represented a significant change in healthcare, the group level of analysis was important in such a change process. The quantitative studies undertaken were able to analyze the group level of influence of important groups and associated social identity measures on group norms related to both acceptance of change and recommending cannabis to patients. This contribution, using the social identity approach in a specific context related to health, environment, and change, offers suggestions for research to extend the social cure body of research to healthcare professionals themselves. Our study of UK healthcare professionals was unique in this regard and offers a path for future research focused upon the various groups found within healthcare systems.

The extended use of the online mapping software by working with subjective social identities and measures related to acceptance of change and group norms provides innovation

through combining technology with an applied tool that is useful for both researchers and practitioners when working with groups. This thesis suggests ways that the mapping tool can be adapted to determine the influential groups that enable or block change processes in applied settings through their importance to individuals and corresponding group norms.

The use of the acceptance of change scale and the interaction between individual and group level of influence was a novel approach in this research. The influence of group measures on the acceptance of change measures provided substantial evidence that the group influence on both general and specific change interventions is important for successful implementation in applied healthcare settings.

Limitations and Future Directions

In the scoping review (Chapter 3), the TDF provided an integrated view of behavioral theories for use in research and applied work; however, it does not provide intersectional links or relationships between the domains. For example, knowledge was identified across all studies; however, it was unclear if this was viewed as a driver of behaviors and if so, to what extent. Developing the links between domains and their drivers would be an opportunity for future hypothesis generating and research. While we were able to undertake analysis of the studies using the TDF, the majority of the reviewed studies were found to have used cross-sectional survey methods.

In terms of the limitations of the UK healthcare professional study (Chapter 4), our desire to keep the survey short for participants meant that we did not collect data related to several measurements previously collected. Another limitation in this study was the use of a convenience sample; as a result, our sample was heavily weighted toward nurses and women. Further, given there was no variation in results between the different professional groups, we suggested that participants were identifying with a superordinate group as UK healthcare professionals. Future research would need to consider the context of the research in relation to the salience and relevance of different professional groups.

While it is difficult to be sure, we assumed that the much lower participant responses of the same sample in our mapping study (Chapter 5) were influenced by COVID-19. This study ran in May of 2020, when UK professionals were either in lockdown in their domestic lives or fully engaged in their professional disciplines as healthcare workers. This situation may also have contributed to the saliency and number of family groups created in the subjective mapping of identities. We would suggest that future studies can continue to obtain appropriate

sample sizes for quantitative analysis. Further, the social identity quality measures that were used in our final mapping study (Chapter 6) showed potential beyond health and well-being outcomes as a resource for designing interventions and measures at a group level to increase acceptance of change in applied settings. Another limitation was that we did not capture any ratings about the experience of using the mapping by participants. However, we had a number of participants that began the mapping activity and did not complete their maps. The average time of completion for those who did was 5 minutes.

We would suggest that mixed method approaches that include qualitative methods for future research would allow in-depth analysis of why certain norms or attitudes were held by participants or their professional groups in relation to change such as recommending cannabis to patients. Once the subjective social identities are identified, the genesis and reasons for group norms and attitudes captured through methods such a focus groups could assist in designing educational interventions that can effectively overcome some of the barriers to change brought about by group membership.

Our analysis pointed to the family group as being prevalent in the participant-created maps, and this appears to be an opportunity in the social identity literature to examine what the interactions are between family and professional groups in situations wherein social norms may be influencing group or team norms. The interaction of the results of group measures with acceptance of change and specific group norms provides an opportunity to change behaviors at an individual and group level in various contexts. Future research could continue to develop quality measures of group membership in relation to behavioral change, particularly in applied health settings.

Concluding Comments

Healthcare professionals face unprecedented changes in their workplaces due to escalating environmental and health challenges of the global syndemic, technology changes, and globalization. The present dissertation aimed to examine how healthcare professionals are influenced by social identity processes and group norms in relation to recommending cannabis to patients. This thesis showed that social identity processes such as self-categorization and professional identification did influence group norms related to a significant change in healthcare such as the use of medical cannabis for treatment. Further, this research introduced some new approaches to working with social identities through focusing on professional identities, group norms, and social identity measures in relation to a specific controversial

change such as the introduction of medical cannabis. It also extends the use of the online social identity mapping tool by enabling working with acceptance or resistance to change more broadly. We suggest that interventions and education seeking to bring about behavior change will continue to be more effective and timelier if the group level of influence on behaviors is made central in both empirical and applied settings in healthcare.

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Appendices

Appendix A: Theoretical Domains Framework

Domain	Construct
1. Knowledge (an awareness of the existence of something)	Knowledge (including knowledge of condition/scientific rationale) Procedural knowledge Knowledge of task environment
2. Skills (an ability or proficiency acquired through practice)	Skills Skill development Competence Ability Interpersonal skills Practice Skill assessment
3. Social/professional role and identity (a coherent set of behaviors and displayed personal qualities of an individual in a social or work setting)	Professional identity Professional role Social identity Identity Professional boundaries Professional confidence Group identity Leadership Organizational commitment
4. Beliefs about capabilities (acceptance of the truth, reality, or validity about an ability, or talent that a person can put to constructive use)	Self-confidence Perceived competence Self-efficacy Perceived behavioral control Beliefs Self-esteem Empowerment Professional confidence
5. Optimism (the confidence that things will happen for the best or that desired goals will be attained)	Optimism Pessimism Unrealistic optimism Identity
6. Beliefs about consequences (acceptance of the truth, reality, or validity about outcomes of a behavior in a given situation)	Beliefs Outcome expectancies Characteristics of outcome expectancies Anticipated regret Consequents
7. Reinforcement (increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus)	Rewards (proximal/distal, valued/not valued, probable/improbable) Incentives Punishment Consequents Reinforcement Contingencies Sanctions

8. Intentions (a conscious decision to perform a behavior or a resolve to act in a certain way)	Stability of intentions Stages of change model Transtheoretical model and stages of change
9. Goals (mental representations of outcomes or end states that an individual wants to achieve)	Goals (distal/proximal) Goal priority Goal/target setting Goals (autonomous/controlled) Action planning Implementation intention
10. Memory, attention, and decision processes (the ability to retain information, focus selectively on aspects of the environment, and choose between 2 or more alternatives)	Memory Attention Attention control Decision making Cognitive overload/tiredness
11. Environmental context and resources (any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adoptive behavior)	Environmental stressors Resources/material resources Organizational culture/climate Salient events/critical incidents Person-environment interaction Barriers and facilitators
12. Social influences (those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviors)	Social pressure Social norms Group conformity Social comparisons Group norms Social support Power Intergroup conflict Alienation Group identity Modelling
13. Emotion (a complex reaction pattern, involving experiential, behavioral, and physiological elements, by which the individual attempts to deal with a personally significant matter/event)	Fear Anxiety Affect Stress Depression Positive/negative affect Burn-out
14. Behavioral regulation (anything aimed at managing or changing objectively observed or measured actions)	Self-monitoring Breaking habit Action planning

Appendix B: Search Strings

Electronic searches

Cannabis Based Medicine AND Cannabis AND/OR Attitudes AND/OR Knowledge AND/OR Identity AND HealthCare professionals OR Practitioners

Database	FOUND
Web of Science	10
PsychInfo	99
Medline	12
Scopus	140
Google Scholar	22
PsycArticles	250
TOTAL	**533**

Web of Science: (10 results)

TS=(Cannabis) AND TI=(Attitude OR Knowledge OR Identity) AND
TS=(HealthCare professionals OR Practitioners)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI Timespan=2000-2019

PsychINFO (99 results)

TX cannabis AND TX (attitude or knowledge or perceptions or identity or opinions or thoughts or beliefs or feelings) AND TX (healthcare professionals or healthcare workers or healthcare providers or practitioners)

- **Limiters:** Publication Year: 2000-2019

MEDLINE (through Web of Science): (9 or 12 results)

- **12 Results:**

  TS=(Cannabis) AND TI=(Attitude OR Knowledge OR Identity) AND
  TS=(HealthCare professionals OR Practitioners)
  Indexes=MEDLINE Timespan=2000-2019

Scopus (140 Results)

(TITLE-ABS-KEY (cannabis) AND TITLE-ABS-KEY (attitude OR knowledge OR perception OR identity OR opinions OR thoughts OR beliefs) AND ALL (healthcare AND (professionals OR practitioners))) AND PUBYEAR > 1999

Google Scholar (22 Results)

allintitle: cannabis attitudes healthcare OR Identity OR knowledge

- **Limiters:** Publication Year: 2000-2019

PsychARTICLES (250 results)

TX cannabis AND TX (attitudes or knowledge or perceptions or opinions or thoughts or beliefs) AND TX (healthcare professionals or healthcare workers or healthcare practitioner or healthcare providers)

- **Limiters:** Publication Year: 2000-2019

Appendix C: Scree Plots

Figure C1

Scree Plot of the Personal Attitude Items

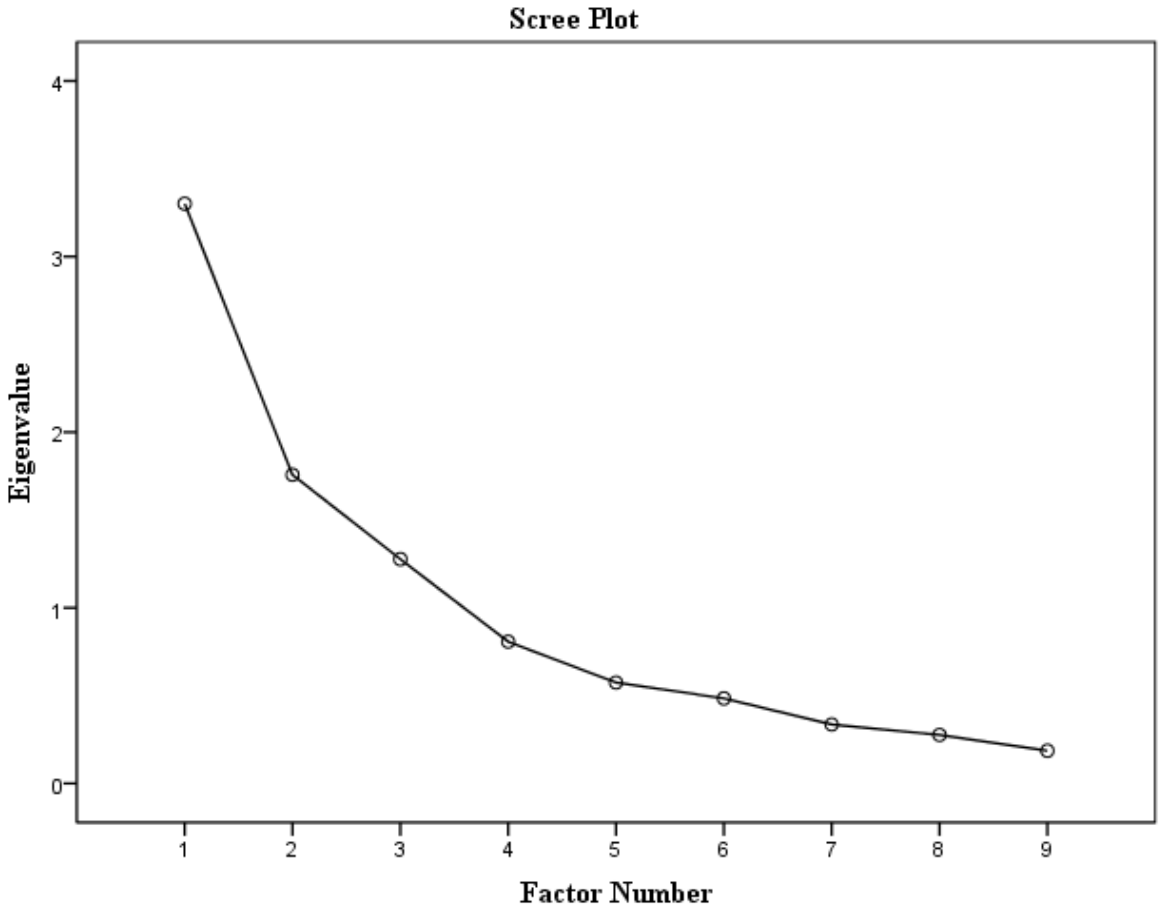

Figure C2

Scree Plot of the Norm Attitude Items