

# **Geospatial Networking Dating Apps: An Exploratory Study on the Knowledge, Attitudes and Practices of a Sample of the Resident Population of the Maltese Islands**

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A dissertation submitted in partial fulfilment of the  
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## Summary:

### Introduction:

The development and surge of use of internet dating sites and dating apps has led to numerous ramifications pertaining to the dynamics of negotiation of sex, contraceptive use, and sexual practices, further led by socio-cultural changes in the pursuit of romantic relationships. This has in turn brought about a research interest in the area and investigation of local use and its myriad implications.

### Aims and Objectives:

The aim of the research is to be an exploratory study targeting at gaining insight into the usage of dating apps in Malta and associated knowledge, attitudes and practices.

### Materials and Methods:

An online survey was disseminated via the social media platform Facebook using paid advertisements and distribution amongst popular pages in Malta. Self-completed information about usage patterns, motivations, user characteristics, sexual behaviours and perceived risks and benefits of dating app use were collected. Conclusions gathered from dating app user respondents collected is applicable to the study context with restricted external validity and generalisability.

### Results and Discussion:

A total of 95 responses were collected. Most dating app users were female, young, (25-34-years), had attained at least a tertiary level of education. They were

of a heterosexual orientation and were born in Malta. The responders were either in an exclusive relationship, dating casually or single and not dating. Most of them had undergone formal sexualities and relationships education.

The most popular dating apps overall were Tinder, Bumble, Badoo and Facebook Dating. The leading dating apps specifically targeting GBMSM were Grindr, followed by Scruff. Motivations for dating app use were diverse, ranging from passing time to sexual, relational and social motives.

Survey respondents were most aware of HIV/AIDS, gonorrhoea, syphilis and chlamydia. The Malta-based sexual health services which were known by most respondents were the genitourinary clinic, breast screening, Richmond Foundation and Caritas.

Two-thirds of respondents had partaken in sexual activities in the previous 12 months and one-third had not, with most of the former having had one sexual partner, followed by 2 to 5. Casual dating has been significantly associated with having casual sex. Being in an exclusive relationship and being single and not actively dating was in turn associated with lack of multiple partners. Survey respondents aged between 25-34 have been found to have significant associations with having sexual relations while drunk.

Pregnancy considerations post-intercourse were very important in individuals who were in an exclusive relationship and those who were single and not actively dating. Moreover, the female survey respondents were also linked to placing high importance on perceptions that considerations of cancer, local soreness or pain, emotional considerations, and urinary tract infections. When considering the sample population, being born in Malta was linked to perceptions that considerations of

physical issues related to body image and self-esteem being deemed as not being important or of a neutral nature.

## Conclusion

The implications of dating app use on the local sexual health scene are considerable. Characterization of users, and associated knowledge, attitudes and behaviours, leading to the development targeted health promotion campaigns can improve the health of these populations considerably.

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## List of Abbreviations:

<b>Abbreviation</b>	<b>Definition</b>
AIDS	Acquired Immunodeficiency Syndrome
ART	Assisted Reproductive Technology
CI	Confidence Interval
CMC	Computer-Mediated Communication
CSE	Comprehensive Sexuality Education
CVSA	Care for Victims of Sexual Assault
ECDC	European Centre for Disease Prevention and Control
EHIS	European Health Interview Survey
EU	European Union
FREC	Faculty Research Ethics Committee
GDPR	General Data Protection Regulation
GIG-ESC	Gender Identity, Gender Expression and Sex Characteristics
GPS	Global Positioning System
GU	Genitourinary
HIV	Human Immunodeficiency Virus
HPDP	Health Promotion and Disease Prevention Directorate
HPV	Human Papillomavirus
HTLV	Human T-cell lymphocytic virus type 1
HyDi	Hybrid Discovery
LGBTIQA+	Lesbian, Gay, Bisexual, Transgender, Questioning/Queer, Intersex and Asexual Plus
MAPHM	Malta Association of Public Health Medicine
MGRM	Malta Gay Rights Movement
MeSH	Medical Subject Headings
GBMSM	Gay, Bisexual and other Men who Have Sex with Men
NSO	National Statistics Office
PICO	Population, Intervention, Comparison, Outcome
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PrEP	Pre-Exposure Prophylaxis
RCT	Randomized Controlled Trial
SAI	Sexually Acquired Infection
SSBQ	Safer Sex Behaviour Questionnaire
SDG	Sustainable Development Goals
SGMY	Sexual and Gender Minority Group
TMS	Tinder Motives Scale
Wi-Fi	Wireless Fidelity
WHO	World Health Organization
UN	United Nations
UREC	University of Malta Research Committee
US	United States

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# 1 Introduction:

## 1.1 Dating Apps

Mobile dating applications, or ‘dating apps’ are software applications designed to aid in the initiation myriad forms of social and romantic interactions. These are downloaded onto a compatible mobile phone or tablet and require either Wireless Fidelity (Wi-Fi) or a data source to operate (Orchard, 2019). They first appeared in 2003 and gained popularity later in the decade with the introduction of the first Apple iPhone and associated App Store (Quiroz, 2013).

The user is asked to create a profile, involving the optional upload of several photos and a short self-introductory blurb. They are also asked to provide information including gender and age (both of self and of desired partner) and to specify the distance they would be willing to travel to meet potential matches. Certain apps also gather information from other social media apps, with the aim of generating further potential matches (Orchard, 2019).

The novelty of dating apps lies in the provision of real-time geo-spatial information, which works via Global Positioning System (GPS), giving them the alternate nomenclature of geosocial networking dating apps (GNDA). This provides a dynamic experience for the user, in contrast to the relatively static nature of the more traditional online dating websites. (Orchard, 2019). The user can both connect with individuals in geographical proximity and browse user profiles of other individuals on the other side of the globe.

Once the profile and variables are set, potential matches are brought up to the user’s screen, who then indicates whether they are interested or otherwise by applying a

swiping motion (right and left respectively). Some dating apps such as Tinder allow introductory conversations to take place only if both parties interact favourably with each other and a match is made (Orchard, 2019). Others allow users to message any available potential matches in decreasing order of geographical vicinity, displayed in a list or grid view, such as Grindr. Other dating apps may utilize a combination of both design features (Wu & Trottier, 2022).

Dating apps vary in their marketing strategies and target audiences. Whereas some are more general platforms (e.g., Tinder) others are meant to be used exclusively by male or female users. They may also differ in terms of the outcome desired ('hook-ups', long-term relationships, friendships) (Quiroz, 2013; Sharabi et al., 2023). Unlike conventional forms of social media (e.g., Facebook), dating apps function on the operator's expectations to interact with strangers, reducing the time between first communication to ensuing offline meeting considerably (Wu & Trottier, 2022).

In recent years, several niche dating apps have also gained popularity, built on the premise of allowing like-minded individuals to interact and form connections (e.g., political and religious beliefs, gender identity, sexual orientation, lifestyle and hobbies, body habitus and disability) (Anzani et al., 2018).

Albeit the fact that most dating apps are being marketed as being free, some offer various membership tiers to users at increasing price-points with associated incremental benefits, described as a 'freemium model'. (Wilken et al., 2019). These may include removal of advertisements and push notifications, the ability to have unlimited likes and to see who likes your profile. (Quiroz, 2013).

## 1.2 Epidemiology of Dating App Use

### 1.2.1 Global

In 2018, over 1500 active dating apps and websites were described (Wilken et al., 2019). In a report issued two years later, there were an estimated 366 million online dating service users, projected to increase to 440 million by 2027. (Dixon, 2023a). The most popular dating apps worldwide in 2022 were Tinder, Litmatch and Bumble with over 70, 58 and 30 million downloads respectively. (Ceci, 2023). Formal prevalence estimates vary considerably, mostly denoting a user prevalence rate of 40 to 50 percent, marginally more popular in males belonging to sexual minorities (Castro & Barrada, 2020).

The global markets with the highest user penetration; namely, the percentage active users of an app in a defined market were the United States (17.16 percent) followed by the United Kingdom (15.97 percent) (Dixon, 2023b). This was corroborated by a 2019 study done by the Pew Research Centre in the United States (US) which indicated that 3 in 10 individuals had used a dating site or app in their lifetime. This revealed an approximate three-fold increase in the number of users between 2013 and 2015 in the younger age range (18 to 24 years) and a two-fold rise in the older ones (55 to 64 years) (Vogels & McClain, 2023; Smith, 2016).

A 2018 Statista Market Portal Survey showed that 12 percent of young individuals (18 to 29 years) reported being in a relationship with partners whom they met online (Dixon, 2023c). This is even higher in same-sex couples, with 70 percent reporting they met their partner online (Rosenfeld & Thomas, 2012).

As of July 2022, dating apps were the most popular means by which individuals connected and subsequently engaged in romantic encounters ('dates'),

40 percent of the general online population, and 35 percent of single individuals (Dixon, 2023d).

### 1.2.2 The European Region and Malta

Online dating service users in Europe are projected to experience an analogous significant growth by 2028 (Statista, 2023a). Similar positive trends are forecasted for revenue from the online dating industry in the region. Estimations for 2023 suggest a user penetration rate of 11.2 percent (Statista, 2023b).

A 2021 publication by the Malta Foundation of the Wellbeing of Society alludes to the paucity of data surrounding prevalence of dating app usage in the Maltese islands, their intended use and related outcomes (Abela et al., 2021). This is further corroborated by a systematic literature review published the same year which identifies local dating app use as a research lacuna (Cassar, 2021).

Despite the lack of local formal academic bodies of work on prevalence of dating app use, several newspaper portals, cultural online media platforms and blogs have alluded to various associated aspects of their use (Cilia, 2021; Borg, 2018; Dingli, 2016 & Carabott, 2021).

## 1.3 The Impact of Dating Apps

Dating apps offer abundant and diverse options in terms of potential partners at a time where an ever-increasing number of sexual and gender identities are being recognized and accepted, contemporaneous to myriad socio-cultural changes (Orchard, 2019). The exponential increment in the popularity of dating apps may be attributed to a multitude of elements. These include demographic and sociocultural changes, increased geographic mobility and globalization, limitations of traditional dating methods, occupational impediments, and the expeditious and pervasive



technological innovations of the last century (Quiroz, 2013).

Individuals are working longer hours and delaying life milestones, having less time and energy for seeking romantic pursuits. Moreover, with the increased dissolution rate of marriages and long-term partnerships, there is also a second wave of users at a later age (Orchard, 2019). Dating apps offer a non-threatening means of taking the fatigue out of dating, acting as a recreational activity of sorts. Their dramatic rise in legitimacy and social acceptability, together with the wide-ranging presence of smartphones and broadband internet, has shifted dating app use from a fringe activity to one that is prominent in modern romantic ventures.

The exponential growth and ubiquitous presence of dating app use suggests they have a profound effect on human sexual behaviour and the interaction with potential mates (Hobbs et al., 2016). It opens the debate as to whether dating apps are contributing to the perpetuation of the 'hook-up culture', the increasingly normative practice of uncommitted sexual encounters rather than being a novel means of forming traditional monogamous relationships (Garcia et al., 2012; Hobbs et al. 2016).

Myriad psychological nuances relating to online dating and dating apps have been acknowledged. These include some pertaining to the user's online behaviour, such as objectification of self and others, various aspects computer-mediated communication (CMC), and sexual interaction (Karsay et al., 2018; Drouin, 2015). Others comprise unique features concerning self-presentation and degrees of disclosure (Ward, 2016), and the advent of digital narcissism and intimacy (Gnambs & Appel, 2018; Lomanowska & Guitton, 2016).

The impact of the impermanent nature of online dating and the commodification of romance, including the shift towards instant gratification

in lieu of meaningful connections and their potential effects on mental, relational and sexual health have also been discussed (Orchard, 2019; Castro & Barrada, 2020).

Dating apps are deemed to be a contributing factor to the expansion of social and sexual networks. These may lead to both an increased number of sexual partners and casual encounters; albeit some individuals utilizing these platforms as a means of meeting possible long-term partners (Anzani et al., 2018; Worthington, 2019). This suggests there are multiple sexual health implications to dating apps including increased susceptibility to sexually acquired infections (SAIs), unplanned pregnancies and sexual risk behaviours (Lehmiller & Ioerger, 2014, Rice et al. 2015; Flesia et al., 2021), albeit studies being inconclusive (Castro & Barrada, 2020).

The use of dating apps also brings about multiple considerations analogous to other issues arising from the digital age. These include aspects related to safety, privacy, digital security (Orchard, 2019; Castro & Barrada, 2020). There is also the element of problematic app use (Bonilla-Zorita et al., 2021; Orosz et al., 2016), and associated anti- social behaviour on apps (Duncan & March, 2019), deception, discrimination and aggression (Lauckner et al., 2019; Bonilla-Zorita et al.; 2021). Another aspect includes the impact of dating apps on self-esteem and body image (Castro & Barrada, 2020).

Dating apps can also be seen as a positive technological progress, allowing for the development of the appropriate cognitive and emotive skills required to navigate them. They offer the opportunity for previously marginalized individuals and individuals belonging to sexual minorities to engage in romantic pursuits in a non-intimidating manner (Ranzini & Lutz, 2017; Finkel et al., 2012). They also simplify the otherwise complex social constructs surrounding the conventional negotiation of romantic relationships (Anzani et al., 2018). They are also efficacious, accessible,

flexible and require less time and effort compared to other traditional methods. (Castro & Barrada, 2020, Yeo & Fung, 2017).

Being a relatively recent sociocultural development, the full extent of the impact of dating apps is difficult to estimate. However, owing to their increased societal acceptability and burgeoning popularity, it can be surmised they are contributing to the changing dynamics of negotiations of romantic relationships as we know them.

#### 1.4 Rationale and Scope

This research was motivated by the growing body of evidence suggesting the increasing role of dating apps in the numerous ramifications pertaining to the dynamics of negotiation of sex, contraceptive use, and sexual practices. This phenomenon, coupled by the recent sociocultural and demographic changes of the Maltese islands, the increasing pervasiveness of internet and smartphone use and paucity of local data on the subject matter make this research exceedingly pertinent.

Sexual health has been listed as Target 3.7 in the 2015 Sustainable Development Goals (SDGs) issued by the United Nations (UN) (United Nations, 2023). In 2017, the Council of Europe released an issue paper highlighting the importance of Women's Sexual and Reproductive Rights in Europe (Commissioner for Human Rights, 2017).

The first National Sexual Health Policy for Malta was launched in November 2010 (Ministry for Health, the Elderly and Community Care, 2010), followed a year later by the National Sexual Health Strategy (Ministry for Health, the Elderly and Community Care, 2011). A National Survey on the Sexual Knowledge, Attitudes and Behaviours ensued in 2012 (Directorate for Health Information and Research,

2012).

The adoption and implementation of a new sexual health strategy was listed as a hallmark in the upcoming National Health Systems Strategy for 2023-2030 (Ministry for Health, 2022). The Health Ministry was also reported to have launched a study on the social determinants behind risky sexual behaviours (Vella, 2022). The new sexual health policy has been reported to be out for consultation in the coming months (Times of Malta, 2023).

Myriad legislative changes have occurred in the recent decades in the Maltese islands. These include the introduction of divorce in 2011 and the emergency contraceptive pill in 2016 (Malta Civil Code, 2011; Malta Medicines Authority, 2016). Another important national milestone includes the implementation of the Gender Identity, Gender Expression and Sex Characteristics (GIG-ESC) Act pertaining to the lesbian, gay, bisexual, transgender, questioning/queer, intersex, and asexual plus (LGBTQIA+) community (GIG-ESC, 2015). These have solidified socio-cultural shifts in the Maltese islands, in turn impacting the romance-seeking landscape.

Data over the last twenty years has revealed an exponential rise in SAIs, both on a European and national level. The European Region of the World Health Organization (WHO) has witnessed an increase in bacterial SAIs, new Human Immunodeficiency Virus (HIV) diagnoses and deaths related to Acquired Immunodeficiency Syndrome (AIDS); resonated by an end-of-year report by the European Centre for Disease Prevention and Control (ECDC) (Health-Europe, T. L. R., 2023; ECDC, 2023a).

In 2021, Malta reported one of the highest rates of gonorrhoea (46.5 per 100,000) and

rise HIV cases since 2012 (728 percent) (ECDC, 2023b). Epidemiological reports by the same agency for that year also show that Malta had the highest rate of syphilis out of the participating 28 countries (32.2 per 100,000) (ECDC, 2023c). Moreover, in 2022, high infection rates of mpox (formerly known as monkeypox) were reported (Valentino et al., 2023). Sexual health has been on the forefront of the public health agenda for a period of time, with the Malta Association of Public Health Medicine (MAPHM) issuing a related press statement in 2018 (MAPHM, 2018).

The latest European Health Interview Survey (EHIS) of 2019-2020 revealed that from the sexually active cohort, 41% reported never using contraception in the previous 12 months; 4% of respondents reported they had previously been diagnosed with an SAI by a healthcare professional and only 67% being aware of free testing and treatment centre available for use at the Genitourinary (GU) clinic (Directorate for Health Information and Research, 2023).

The demographics of the Maltese islands have also changed dramatically in the last decade, with a conspicuous rise in both European Union (EU) and third-country nationals, as elucidated by the latest census carried out by the National Statistics Office (NSO) in 2021 (NSO, 2023a). The dynamic flux of residents of the Maltese islands, coupled by the influence of the tourism industry is another facet of the intricate relationship of sexual behaviour and sexual health in the Maltese islands.

Internet use in Malta has shown an increasing trend in the last years, increasing from 91.5 percent in 2022 to 92 percent in 2023 with patterns of decreasing access with increasing age, albeit noting a usage rise in the 65-74 age group. Most individuals reported using the internet daily or almost daily (NSO, 2023b; NSO, 2024). A 2023 Social Media Use Trend survey noted an ever-growing percentage of

smartphone users, reaching 88 percent in the same year (Misco, 2023).

Another distinct public health domain requiring consideration is the intersection between digital technologies and their impact on health (Scott et al., 2017), as well as their utilization for delivering public health communications (Hu, 2015). These were listed as an area of priority in the latest Mental Health Strategy 2020-2030 (Ministry for Health, 2019). Multiple studies looked at maximizing public health interventions by transitioning to the digital era, including the use of dating apps as a portal for reaching target audiences (Guse et al., 2012; Kilaru et al., 2014; Bailey et al., 2015; Gabarron & Wynn, 2016; Wadham et al., 2018; Albury & Henry, 2023).

In terms of local research, various dissertations and academic articles pertaining to sexual behaviour trends in the younger generations were published (Duca, 2012; Melillo, 2015; Cassar, 2021). As far as the researcher is aware, there have been no local studies to date looking specifically at dating apps vis-à-vis sexual health. Therefore, an exploratory study looking at the various aspects of dating app use in the Maltese islands is justified and opportune. This dissertation therefore has the potential of providing a more textured portrayal of the current landscape in the Maltese islands pertaining to the usage of dating apps. This can in turn aid in the development of effective health promotion interventions which identify behaviours of dating app users need to be targeted across the varied spectrum of users, and which type of service and information is needed to cater for their need.

## 1.5 Research Aim and Objectives

The aim of the research is to gain insight into the usage of GNDAs in Malta and the associated knowledge, attitudes, and practices. To achieve this aim, the following

objectives were set:

1. To collect and analyse data on the demographics of local dating app users to highlight aspects of sexual health practices and attitudes in Malta.
2. To help elucidate local individuals' knowledge, attitudes, and practices of its users and how these in turn influence sexual practices, risk-taking and romance-seeking behaviours.
3. To assess the motivations behind the use of dating apps can identify nuances between romance-seeking and digital technology and the ensuing impact on sexual health practices in the Maltese islands.

## 1.6 Expected Implications and Contribution to Knowledge

In terms of general knowledge lacunae, the level of depth of comprehension on a global, European and national level on dating apps are distinct. Overall, studies have exponentially increased over the last two decades, parallel to the increased prevalence of dating app use and analogous research interest in the subject. However, whereas supranational studies are exploring specific nuances and outcomes of dating app use, local data is considerably limited.

This study is anticipated to target the local knowledge gap pertaining to dating app use. It aims to investigate an aspect of public health in the context of digital negotiations of social, romantic, and sexual encounters and associated sequelae. It aims to act as an introduction to this topical, contemporary subject matter and reduce the pronounced local data paucity by directing future research.

It is envisaged that this study will provide an improved understanding of GNDA use in the Maltese islands. It sets out to provide a better understanding of the characteristics of dating app use and its users and associated motivations, as well as its perceived benefits and risks. It also aims at identifying combinations of these

factors and relating them to knowledge, attitudes, and sexual behaviours.

A clearer understanding of how GNDAs influence sexual behaviours can in turn aid in informing the design and planning of effective public health communications and interventions aimed at promoting sexual wellbeing, elevating them to meet the novel needs of the digital era. Moreover, valuable insights into the interface between digital technologies and sexual health can aid in the development of effective policies.



## 2 Literature Review:

### 2.1 Overview

Initial studies on dating apps centred on young heterosexual populations and analysis of any association between dating apps and potentially harmful sexual health sequelae, including SAIs, and associated psychological implications (Enomoto et al., 2017; Dai et al., 2018; Worthington, 2019). Ensuing studies attempted to investigate the compound sociocultural and individual factors that motivate individuals to use dating apps (David & Cambre, 2016; Timmermans & Caluwé, 2017a; Duguay, 2017) and the varied experiences navigating these platforms (Beauchamp et al., 2017; Alexopoulos et al., 2020).

Additional studies have explored the significance of space and location, two central constructs in dating app culture. Others focused on queer identities and other sexual subcultures (Miles, 2017; Choi et al., 2017). The two most popular dating apps, Tinder and Grindr, have received the most academic scrutiny (Wu & Ward, 2018; Ciocca et al., 2020); however, other apps are also now being studied (Orchard, 2019).

Despite being a relatively recent phenomenon, various reviews on GNDAs were carried out, mostly focusing on specific populations (Maxwell et al., 2019; Queiroz et al., 2020) and/or certain risks or outcomes (Holtzhausen et al., 2020; Bonilla-Zorita et al., 2021; Phan et al., 2021; Filice et al., 2022).

The aim of this literature review is the critical analysis of the literature on the relationships between GNDAs, sexual health and any associated mental health effects. This also includes particular focus on the characteristics of dating app use and user demographics and their associated motivations, as well as the associated

myriad perceived benefits and risks, with identification of existing lacunae.

## 2.2 Operational Definitions

The following refer to the core concepts which will be assessed in this dissertation, analysing how user characteristics relate to the outcomes of interest. This will in turn be followed by the review protocol and presentation of findings from a structured review of the academic literature.

### 2.2.1 User Characteristics

User characteristics are important to be able to characterize who is using dating app users. The variables considered include age, gender, sexual orientation, educational attainment, sexualities, and relationships education.

#### 2.2.1.1 Age

Age is an important determinant of dating app use, with the younger populations being the most investigated and found to be the most prevalent users of GNDAs rather than other forms of online dating services (Anzani et al. 2018; Castro & Barrada, 2020). However, dating apps are also increasing in popularity in the senior (>65 year) age group (Smith, 2016). A cut-off at 74 years was applied, in line with the results published from NSO's 2022 ICT Usage by Household Report, which suggest that 91.5 percent of individuals aged 16-74 were internet users (NSO, 2023b).

#### 2.2.1.2 Gender

Initial studies suggested that males are more active users of online dating (Abramova et al., 2016) and partake in increased casual sexual encounters (Sumter & Vandenbosch, 2019), giving a 3:2 male to female user ratio (Weiser et al., 2018); further corroborated by more recent studies which denote that a male sex is a predictor

of the use of GNDA's (Castro & Barrada, 2020).

However, other studies have shown no gender relations predicting the use of dating apps (Ranzini & Lutz, 2017; Hahn et al., 2018). A recent study has purported that females use dating apps as a sex-positive platforms, allowing them to take charge of one's sexuality and relationships (Chan, 2018).

### 2.2.1.3 Sexual Orientation

One of the predictors for dating app use is being a male from a sexual minority group (Castro et al., 2020). Sexual orientation has been a foundational variable when considering GNDA research, with this cohort being the most studied and found to be the most prevalent dating app users (Badal et al., 2018; Hahn et al., 2018). However, with the rise in heterosexual GNDA users, there has also been analogous growth in research interest beyond this sexual minority category (Sumter & Vandenbosch, 2019; Ranzini & Lutz, 2019).

### 2.2.1.4 Relationship Status

Both traditional and more recent studies concur that use of GNDA is significantly higher in single individuals than those with a partner (Timmermans et al., 2018), some arguing that a single status is the most considerable sociodemographic predictor of dating app use (Castro et al., 2020).

However, some studies have unveiled a considerable percentage (10 to 30) of active GNDA users who do have a partner (Timmermans et al., 2018; LeFebvre, 2018; Alexopoulos et al., 2020), with most of the research focusing on sociosexuality, or the "willingness to engage in sexual activity outside of a committed relationship and emotional bonding" (Simpson & Gangestad, 1992). It has been extrapolated that sociosexuality is in turn a mediator of increased sexual

risk behaviours and casual sexual encounters (Ciocca et al., 2020).

#### 2.2.1.5 Educational Level

It has been suggested that educational level have a direct correlation with dating app use, albeit a potential bias being present in that the majority of studies were carried out on university students (Anzani et al., 2018; Castro & Barrada, 2020), which may have limitations in terms of generalizability. A recent study showed an inverse relationship between grades and dating app use (Shapiro et al., 2017).

#### 2.2.1.6 Sexual Education and Knowledge

Comprehensive sexuality education (CSE) is defined by WHO as “age-appropriate information about sexuality and their sexual and reproductive health” (WHO, 2023). Despite the diversity in types of formal and informal education, it is suggested that the former may have a protective impact on early sexual health behaviours, proactive screening for SAIs and contraceptive use, particularly to a greater extent in vulnerable groups (Mueller et al., 2008; Lindberg & Maddow-Zimet, 2012; Bourke et al., 2014). The importance of inclusion of sexual and gender minority youth (SGMY) has also been highlighted (Pampati et al., 2021).

The use of dating apps as a valuable tool in health research and public health interventions is also being discussed in the academic literature (Albury et al., 2020). Assessing the awareness of SAIs, risky behaviours, contraception and services available can act as an indirect quantitative tool for determining proactive navigation of one’s sexual health.

### 2.2.2 Outcomes of Interest

The following public health areas will be considered in this dissertation, which will be defined in the appropriate ensuing sections. The outcomes of interest

shall be considered in the context of GNDA's.

### 2.2.2.1 Motivations

The general perception of dating app use is that of a frivolous and superficial nature. However, recent literature has showed that casual sexual encounters are only one aspect of numerous intentions behind GNDA use, which diverge depending on the various sociodemographic user characteristics (LeFebvre, 2018; Anzani et al., 2018; Ciocca et al., 2020).

Multiple classifications denoting reasons behind dating app use have been devised (Orosz et al., 2016; Ranzini & Lutz, 2017; Sumter & Vandenbosch, 2019). The scale used in this dissertation is an adaptation of the tool developed by Timmermans and De Caluwé, which appraises 13 motives behind GNDA use. (Timmermans & De Caluwé, 2017b).

### 2.2.2.2 Usage Patterns

Formal analyses of dating app user prevalence varies considerably, with most of the studies focusing on Tinder and Grindr, the two most popular GNDA's. Characteristics of dating app use may be further fragmented into those related to profiling (i.e., prior to GNDA set-up and use), during actual dating app use and following its use, focusing on the transition between online and offline encounters and behaviours with fellow dating app users (Castro & Barrada, 2020).

This dissertation will focus mostly on elucidating the behaviours during and following GNDA use, by looking at frequency of use and types of offline encounters. This will in turn be further reinforced by general perceptions on various aspects of GNDA's.

### 2.2.2.3 Sexual Behaviours

WHO defines sexual health as “a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence” (WHO, n.d.).

Sexual risk behaviours are a major cornerstone of dating app research, with resultant indeterminate conclusions both in the epistemological and empirical contexts (Ciocca et al., 2020; Castro & Barrada, 2020).

Risky sexual behaviours are ways of acting which lead to increased risk of SAIs and associated sequelae, as well as non-consensual or coerced sexual encounters. These include having multiple sexual partners, casual sexual activity and lack of contraceptive use together with the compounding effects of alcohol and illicit substances, the latter conferring additional risk.

Reduced engagement in preventative measures, such as regular screening and treatment and discussion of sexual history and boundaries with prospective partners are also contributing factors. Individual conscientiousness on aspects of safe sex are further important elements. These may be in turn associated with age, marital status and other social and economic determinants (Wellings et al., 2006; Enomoto et al., 2017).

### 2.2.2.4 Perceived Benefits and Risks

The use of GNDAs is both socially and psychologically driven, and the implications for both are diverse. Positive and negative associations between GNDAs and various psychological implications will be investigated. The psychology of personality in the context of dating apps shall not be assessed.

Factors assessed include body image, body self-esteem and self-worth, intimacy, and privacy concerns. Considerations will also be made in terms of digital safety, ease of use and accessibility of dating apps (Castro & Barrada, 2020).

### 2.3 Literature Review of Studies

The following literature review shall focus on exploring the evidence relating GNDA user characteristics to the outcomes defined, namely motivations, usage patterns, sexual behaviours and perceived risks and benefits. This section shall focus on the description of the search strategy used, followed by a critical analysis and summary of the results.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Checklist (Page et al., 2021) was used as a protocol for the literature review to the fullest feasible extent. The research question and associated objectives were similarly identified using the Population, Intervention, Comparison, Outcome (PICO) Framework (Leonardo, 2018), summarized in Table 1.

Table 1: PICO Framework applied to define review question.

<b>Population</b>	Adults Users of GNDA's
<b>Intervention</b>	Public Health Interventions targeting Dating App Users
<b>Comparison</b>	Adult Non-Users of GNDA's (not included)
<b>Outcome/Context</b>	Motivations, Usage Patterns, Sexual Behaviour, and Perceived Benefits and Risks of App Use
<b>Overall review question</b>	Are there any associations between GNDA user characteristics and motivations behind use, usage pattern, sexual behaviours and perceived risks and benefits of app use?

#### 2.3.1 Sources and Search Strategy

The information sources listed in the following table (Table 2) were deemed relevant to the research subject matter. These were used to run advanced searches for the predetermined variables and associated outcomes. Methods used to assess the risk

of bias in the included studies were via the utilization of the ROBIS tool (Whiting et al., 2016). Results were then synthesized in a textual (qualitative) approach.

Table 2: Information sources used for advanced searches of indexed material.



The search engine Google Scholar and the University of Malta platform Hybrid Discovery (HyDi) were initially used to identify and retrieve the most suitable databases for the research question. Once identified, these were then subsequently searched individually. This process was carried out to ensure a comprehensive and exhaustive search of the literature via the most appropriate sources. A combination of search terms together with Medical Subject Headings (MeSH) were used, summarized in the following table (Table 3).

Table 3: Summarization of Table 3: search terms used during review.

<b>Core Concept</b>	<b>Combined Search Terms/MeSH</b>
Dating App	Geosocial Networking Dating App* OR Sex App
User Characteristics	User Attribute* OR Feature* OR Qualit*
Age	N/A
Gender	Sex
Sexual Orientation	Sex Orientation OR *exuality OR *exualities
Relationship Status	Civi* OR Marital, Status OR Situation OR Condition
Educational Level	Educational Achievement OR Status



Sexual Education and Knowledge	Relationships and Sexuality Education OR Sexuality Education OR Comprehensive Sexuality Education
Outcomes	Result* OR Aftermath OR After-Effect OR Sequela* OR Consequence
Motivations	Expectation* OR Incentive*
Usage Patterns	Pattern of Use, OR Frequent* OR Habit*
Sexual Behaviours	Sexual Behavior*r*, Sex* Activit*
Perceived Benefits and Risks	Risk Assessment OR Risk-Benefit OR Analysis OR Health Risk OR *advantage OR Perk OR Asset OR Gain OR Drawback OR Catch OR Pitfall OR Weakness OR Detriment

Types of studies to be included in the literature review include academic articles published in peer-reviewed journals including meta-analyses, systematic reviews, and primary research studies. Case reports, books and book chapters, conference proceedings and other documents will not be considered.

### 2.3.2 Limits and Eligibility Criteria

The literature review was carried out between November 1<sup>st</sup> and January 19<sup>th</sup>, 2024. Due to the exponential increase in academic interest in the area, and the phenomenon of GNDAs being a relatively recent one, articles published between 2013 and 2023 shall be considered for this literature review. However, papers deemed to contain relevant material to the subject matter, published prior to the time range specified, were also included. Following are the inclusion and exclusion criteria applied (Tables 4 and 5 respectively).

Table 4: Inclusion criteria applied to search results.

<b>Inclusion Criteria</b>
- Published between 1 <sup>st</sup> January 2013 and 31 <sup>st</sup> December 2023
- Published in English as a primary language
- Published in peer-reviewed journals
- Include quantitative, qualitative, empirical and/or mixed methodology
- Only include full texts
- Focused on motivations, usage patterns, sexual behaviours and perceived benefits and risks of dating app use

- Refer specifically to dating apps or online dating in relation to dating apps
- Refer to adults (18+ years)
- Relate to public health interventions

Table 5: Exclusion criteria applied to search results.

<b>Exclusion Criteria</b>
- Published outside aforementioned 10-year range
- Published in any language other than English
- Abstracts, poster presentations, book chapters, conference papers, other articles and documents
- Focus solely on personality factors of dating app users
- Focus on use of dating apps during the COVID-19 pandemic
- Focus on or include adolescents or individuals <18 years of age
- Not directly related to variables or outcomes of interest or focus on ancillary topics
- Focus on setting up of a profile and associated features
- Focus on sexual assault or violence (both digital and physical)
- Focus only on racial prejudice, disparity or discrimination
- Focus solely on gender equality issues
- Use dating apps as recruitment portals for research or in population estimates
- Only refer to online dating without reference to dating apps
- Focus on cyber-bullying and sexual harassment
- Refer to public health interventions on online platforms or social media sites other than GNDAs

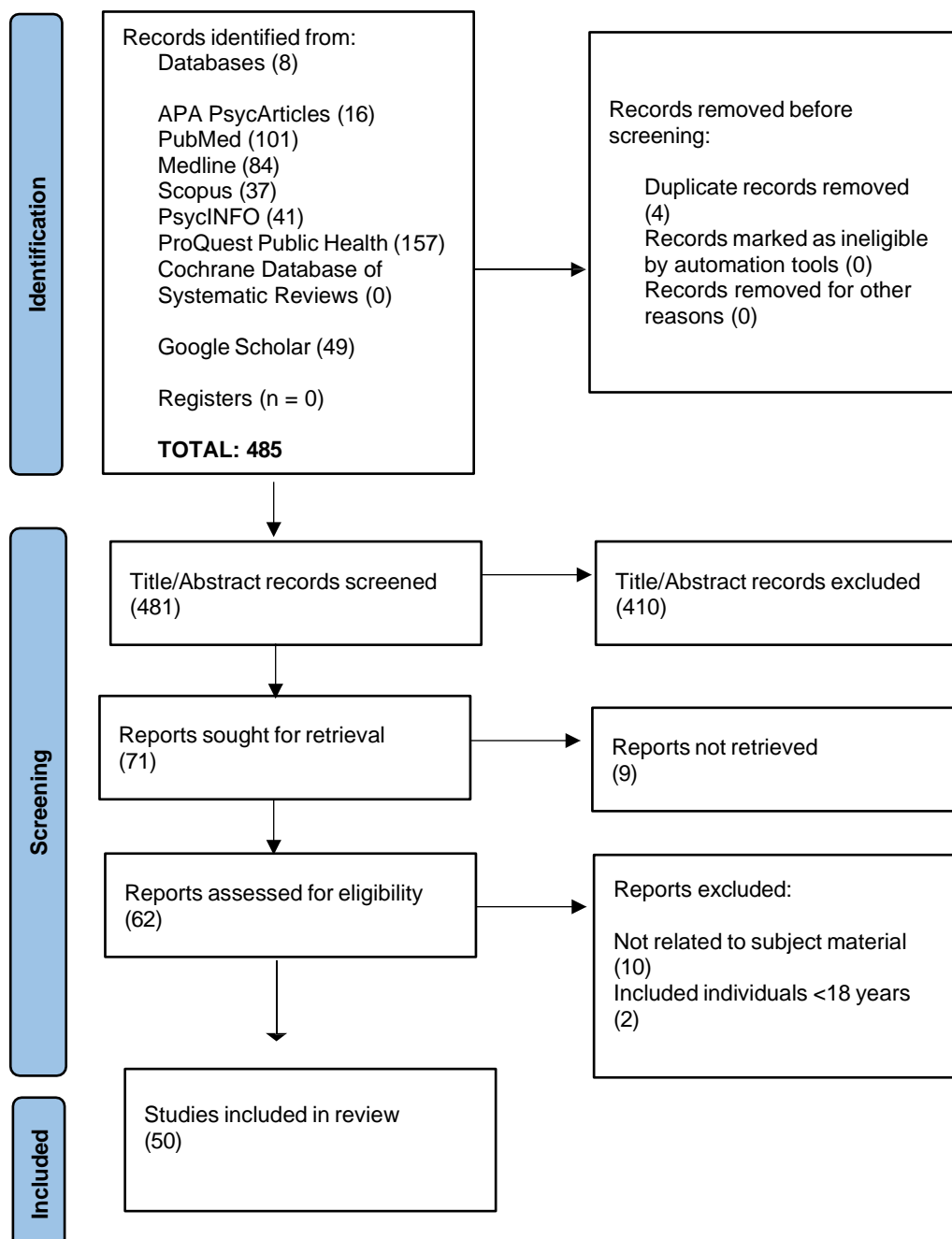
### 2.3.3 Screening Process

Database filtering of search outcomes retrieved 481 articles, with 50 articles meeting the inclusion criteria and incorporated in the literature review, summarized in the ensuing PRISMA flow-chart (Figure 1). A summary of articles reviewed can be found in Appendix A.

The literature review was conducted in a systematic manner to the greatest feasible extent. However, due to the novel, broad and highly varied nature of the subject matter, there is a risk that some relevant research was inadvertently not included.

### 2.3.4 Overview of Results

Articles included in the literature review used diverse methodologies. These included 30 quantitative (60%), 5 qualitative (10%) and 4 mixed methodologies (8%). Other research papers comprised of 9 literature reviews (18%), 1 randomized controlled trial (2%) and 1 meta-analysis (2%). Most papers originated from Europe ( $n = 13$ ; 26%), followed by the US ( $n = 11$ ; 22%), Asia ( $n = 8$ ; 16%) and Australia ( $n = 8$ ; 16%), the UK ( $n = 5$ ; 10%), South America ( $n = 4$ ; 8%) and Canada ( $n = 1$ ; 2%).



*From:* Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

Figure 1: PRISMA 2020 Flow Diagram showing screening and filtering process utilized.

### 2.3.5 User characteristics

Original studies suggest that the archetypal dating app profile belongs to a young (24-31 years) male (Goedel & Duncan, 2015; Queiroz et al., 2017; Castro & Barrada, 2020; Castro et al., 2020) of Caucasian ethnicity, who is gay, bisexual or other man who has sex with men (GBMSM) (Garga et al., 2021b; Power et al., 2022). He also has a higher level of educational attainment and reports higher incomes (Goedel & Duncan, 2015; Zou & Fan, 2017; Wang et al., 2018; Castro & Barrada, 2020; Liberacka-Dwojak et al., 2023). These studies were carried out utilizing various methodologies, mostly focusing on GBMSM.

However, recent studies have disputed the earlier findings, suggesting a considerable increment in heterosexual users; reflected in the analogous increased research interest (Obarska et al., 2020; Castro & Barrada, 2020). Dating app use has been found to be present irrespective of sociodemographic characteristics and in all social strata (Castro & Barrada, 2020).

With respect to gender, it was initially asserted that being male was a predictor of dating app use and associated with casual sexual encounters (Castro & Barrada, 2020; Castro et al., 2020; Garga et al., 2021a). However, recent research has suggested there is no significant difference in the proportion of dating app users for both genders (Castro & Barrada, 2020). Younger ages were also consistently associated with a higher frequency of GNDU use (Gatter & Hodkinson, 2017; Castro & Barrada, 2020; Choi et al., 2021; Garga et al., 2021a).

The strongest sociodemographic predictor for dating app use was having a single relationship status (Garga et al., 2021b). However, a considerable number of individuals were found to be active GNDA users and have partners (Castro & Barrada, 2020; Castro et al., 2020).

The ubiquitousness and inherent features of GNDA also brings forth the argument of previously marginalized and potentially vulnerable communities, including disabled individuals being active users. With increased interventions and survival rates, there are also young individuals with life limiting or life-threatening conditions (LLTCs) who are seeking connection, relationships and romance using digital media (Marston et al., 2020).

### 2.3.6 Motivations

Motivations for using dating apps are diverse. Despite stereotyping GNDA use with the promotion of casual sex and ‘hook-up’ culture, its use has been consistently shown to be motivated by multiple other reasons, including social, relational or romantic purposes and entertainment of oneself amongst others, with sexual motivations being only one (Holloway et al., 2014; Goedel & Duncan, 2015; Gatter & Hodkinson, 2017; Sawyer et al., 2018; Ciocca et al., 2020; Castro & Barrada, 2020; Marston et al., 2020; Hermosa- Bosano et al., 2021a; Choi et al., 2021; Bineau et al., 2021; Blake et al., 2022; Dhoest, 2022; Liew et al., 2023; Liberacka-Dwojak et al., 2023).

Dating apps act novel avenues for GBMSM in that they are discreet and allow like-minded individuals to engage with each other and form a community (Zou & Fan, 2017; Wang et al., 2018; Obarska et al., 2020; Castro & Barrada, 2020; Hermosa-Bosano et al., 2021a), but are also an effective and speedy method of identifying and locating potential sex partners (Queiroz et al., 2017).

Some gender differences were identified with respect to dating app use, with males described as being more likely to be motivated by sexual and relational motives (Gatter & Hodkinson, 2017; Newett et al., 2018; Griffin et al., 2018; Orosz et al., 2018; Castro & Barrada, 2020; Tavares et al., 2020). Other studies have found the contrary (Barrada & Castro, 2020; Barrada et al., 2021). Higher income levels have been associated with more fulfilled expectations compared to lower incomes (Hermosa- Bosano et al., 2021a).

Motivations may also vary depending on the age of the user. Older same-sex individuals were found to seek mostly five outcomes from dating apps: relationships, humour, romance and companionship (sharing of interests and experiences) (Marston et al., 2020; Dhoest, 2022). Younger age groups were found to be associated with greater use of apps for purposes of seeking sexual partners (Queiroz et al., 2017; Obarska et al., 2020). The relationship between exposure to technology at the time of sexual exploration may also affect the motivations for use, which may change along the life-course. Motivations for the same individual may also change, depending on the needs of the user at the time of study (Dhoest, 2022).

The relational status of GNDA users has also been linked with different motivations. Users having a partner were found to be more likely to use dating apps for sexual encounters, leading to them having a higher number of sexual and romantic partners than single GNDA users, potentially due to sociosexual practices (Goedel & Duncan, 2015; Sawyer et al., 2018; Castro & Barrada, 2020; Garga et al., 2021a). It has also been suggested that a certain element of flexibility exists with mating orientations and preferences and may also overlap in individuals looking for both casual and long- term romantic connections, occasionally simultaneously (Barrada et al., 2021).

Dating app use may also change depending on the location of the user, with users potentially seeking more social connections or casual sexual encounters while attending festivals or other social events (Garga et al., 2021a). This study involved the unique perspective of assessing dating app use during a 3-day music festival, thereby assessing finite dating app outcomes. However, the respondents were assessed when they visited a permanent health promotion stand, potentially leading to elements of selection bias. This can also have implications for Malta, which is commonly marketed as a ‘party island’.

Gratification elements may also be important motivators of GNDA use, including entertainment, habit, leisure, distraction and information, with the expectancy that dating apps will help in achieving their outcomes of interest, ideally with little effort (Goedel & Duncan, 2015; Hermosa-Bosano et al., 2021a; Liew et al., 2023). Other motives may also include dating app use for self-esteem enhancement (Bonilla-Zorita et al., 2021).

Travel experiences may also be impacted by GNDA use. A shift from traditional travel methods is giving way to digitally mediated, individualized and independent travel experiences. GNDA users can negotiate and communicate with each other through dating apps. Interactions may range from a simple online restaurant recommendation to an offline day tour (Katz, 2023).

Motivations limiting GNDA include the labelling of dating app users in some societies or cultures as being promiscuous or less willing to be in a monogamous relationship oftentimes also lead to withholding sharing prior GNDA use from romantic partners (Choi et al., 2021). The users’ perception of themselves as sexual beings may also impact the motives and methods how they pursue such goals on GNDA (Mateizer & Avram, 2022).

GNDAs have been stereotypically labelled as a novel means of engaging in casual sexual relations. However, research is indicating that GNDAs are merely one of the many tools which humans utilize to interact with each other (Barrada & Castro, 2020). Personal digital technologies and dating apps have far-reaching implications that go beyond the seeking of a sexual relationship (Katz, 2023).

### 2.3.7 Usage Patterns

Users, particularly GBMSM were found to be very familiar with dating apps, using multiple apps (Goedel & Duncan, 2015; Holloway et al., 2014; Zou & Fan, 2017; Queiroz et al., 2017; Garga et al., 2021b, Dhoest, 2022). The majority had used them for long periods (more than twelve months) and at least used one GNDA daily (Goedel & Duncan, 2015; Zou & Fan, 2017; Queiroz et al., 2017; Dai, 2023), but ranges vary (Barrada & Castro, 2020). The commonest timings for were during weekends and in the afternoon and evenings during weekdays. (Goedel & Duncan, 2015; Queiroz et al., 2017).

The use of dating apps is often related to social acceptability, with the choice of which GNDAs to use dependent on the outcome preferred by the user (such as a relationship, friendship, or sexual encounter), the target audience and surrounding reputation of the dating app (Liew et al., 2023). Some apps are more popular and targeted for individuals seeking sexual encounters, others are more popular with individuals looking for romantic relationships (Bineau et al., 2021).

Studies suggested that a considerable amount of Tinder users open the application at least daily, with one suggesting that Tinder users utilized the app for up to 90 minutes per day (Castro & Barrada, 2020). However, active dating app use varies between studies (Tomaszewska & Schuster, 2020; Liberacka-Dwojak et al., 2023). Being a man from a sexual minority was also deemed to be a predictor for daily



frequency and higher duration of GNDA use. Gender differences were also identified, with males using GNDA more intensely and females more sporadically and productively (Castro & Barrada, 2020).

Studies on the frequency of offline encounters following GNDA use are varied, ranging from rare to up to 70 percent (Castro & Barrada, 2020; Tomaszewska & Schuster, 2020). These conclusions were made through the systematic review of 70 articles in the former and a questionnaire analysis of university students ( $n = 491$ ) in the latter. The characteristics of the offline encounters formed were also diverse, with some studies suggesting that either the majority of encounters were sexual in nature and others stating that formation of platonic friendships were (Castro & Barrada, 2020; Tomaszewska & Schuster, 2020).

Some studies suggest a positive association between duration of use of dating apps (more than two years) and the number of sexual partners (Garga et al., 2021a). Others have alluded to a link between daily Tinder use and high levels of offline encounters as being a potential predictor of problematic use of dating apps (Liberacka-Dwojak et al., 2023).

There is also a dearth of information relating to the characteristics and preference of dating app users in choosing the free, standard models versus the premium versions, with some reports indicating the former is more popular (Liberacka-Dwojak et al., 2023). With the increasing cost-of-living crisis, premium and subscription-based dating apps may be less appealing options (Liew et al., 2023).

### 2.3.8 Sexual Behaviours

Myriad studies have suggested that dating app use is correlated to increased reporting of sexual contacts, casual sexual interactions and risky sexual behaviours leading to increased sexual health sequelae compared to non-users (Choi et al., 2016; Huang et al., 2016; Zou & Fan, 2017; Wang et al., 2018; Sawyer et al., 2018; Jennings & Kypridemos, 2019; Ciocca et al., 2020; Tavares et al., 2020; Garga et al., 2021a; Garga et al., 2021b; Ren et al., 2021; Power et al., 2022; Dai, 2023; Liberacka-Dwojak et al., 2023).

This association can potentially be due to the ubiquitousness, accessibility and portability of smartphones coupled with the popularity of GNDAs in view of their efficacy and discretion in the seeking of sexual partners (Wang et al., 2018; Bonilla-Zorita et al., 2021; Barrada et al., 2021). However, other studies suggest that albeit dating app users are linked to riskier sexual behaviours, they are also engaging in more preventative efforts (Castro & Barrada, 2020; Bineau et al., 2021; Garga et al., 2021a; Garga et al., 2021b; Knox et al., 2021).

The behavioural phenomenon of sociosexuality has been identified as a driver for dating app use (Ciocca et al. 2020; Castro & Barrada, 2020; Dai, 2023). An important consideration is that in its essence, sociosexuality, rather than dating app use, can be considered a strong predictor of risky sexual behaviour (Botnen et al., 2018; Ciocca et al. 2020). Similarly, sexual compulsivity and sexual sensation-seeking can also be considered as significant moderators of risky sexual behaviour (Dai, 2023).

Despite offering novel arenas of meeting new people, some studies found no change in terms of sexual behaviour in GNDA users compared to traditional dating

(Newett et al., 2018). Analysis of risky sexual behaviours in different populations has also led to inconclusive results (Castro & Barrada, 2020). Some studies suggest that a younger age is linked to higher vulnerability to unprotected intercourse and ensuing higher risk for HIV and SAIs (Choi et al., 2021), but others suggest the opposite (Dai, 2023). The former analysis was done via a quantitative assessment of 31 GBMSM in Hong Kong; the latter via a quantitative assessment of 680 participants between the ages of 18 and 35 years.

Some results also suggest there is no significant difference in condom use between online and offline encounters (Ciocca et al., 2020), but others do (Choi et al., 2016; Bonilla-Zorita et al., 2021; Choi et al., 2021; Garga et al., 2021b). Similar conflicting results have also been obtained in terms of HIV risk in GBMSM between app users and non-users (Zou & Fan, 2017; Wang et al., 2018). However, GBMSM dating app users have been identified to be at a higher risk of having unprotected intercourse with individuals of unknown HIV status (Obarska et al., 2020). It has also been suggested that GNDA users may utilize condoms as an alternative to HIV serostatus disclosure (Chadwick et al., 2023).

Long dating app usage duration has been associated with several features, including the potential for exposure to risky situations (Queiroz et al., 2017; Liberacka- Dwojak et al., 2023). Recurrent dating app use and high active GNDA screen time was found to be associated with higher-than-average frequency of lifetime sex, recent sexual encounters and number of sexual partners (Queiroz et al., 2017; Hoenigl et al., 2020). GNDA users of one year or more were also discerned to be more inclined to partake in substance use, exhibit depressive symptoms and worry about infidelity (Queiroz et al., 2017). This has multiple public health implications, suggesting that prolonged dating app use can have implications on myriad aspects of

the quality of life. Recreational use of drugs and alcohol have been reportedly prevalent in GBMSM (Colfax et al., 2004), more so in GNDA users (Zou & Fan, 2017). Tinder users were more likely to have consumed higher alcohol levels and made use of illicit substances in the previous 6 months (Erevik et al., 2020). However, other studies suggest that there are no inherent differences in individuals using dating apps versus online dating or non-users (Gatter & Hodkinson, 2017).

Alcohol and substance use can be considered powerful predictors of increased risky sexual behaviours (Boonchutima & Kongchan; 2017; Wang et al., 2018). The relationship between alcohol and substance use and decreased sexual health outcomes may be important confounding factors when considering the role GNDA's play in risky sexual behaviours (Ciocca et al., 2020). Alcohol and substance use has also been found to increase in Malta, as suggested by the latest EHIS (Directorate for Health Information and Research, 2023).

GNDA users may be regular alcohol and substance users beforehand and seek encounters with like-minded individuals via dating apps. The consumption of such substances could also potentially aid in the reduction of anxiety associated with meeting an individual in person. Moreover, considerable number of encounters take place in establishments which serve alcohol. Lastly, individuals who use Tinder (and potentially other GNDA's) may have innate features that make them more likely to both use dating apps, and consume more alcohol and recreational drugs (Erevik et al., 2020)

Another important consideration, particularly in GBMSM, is sexualized drug use, commonly known as 'chemsex', where drugs are consumed prior to or during a planned sexual encounter to enhance or prolong it. Chemsex has been associated with multiple sexual partners, low levels of condom use and unavailability of SAI

and HIV status of sexual partners; together with the inherent sexual inhibitory effects of the drug and potential parallel consumption of alcohol and other recreational substances (Boonchutima & Kongchan; 2017; Obarska et al., 2020; Choi et al., 2021).

Certain innate features of GNDAs, such as the ability to communicate sexual preferences, immediacy and geospatial vicinity may act as platforms for individuals to engage in sexualized drug use or persuade others to. Dating apps can provide a supplemental and convenient media through which individuals who are already active chemsex' participants can look for sexual partners (Patten et al., 2020).

Some dating apps do not allow the publishing of certain words or phrases on one's profile. These may include 'party' (referring to party and play, another phrase used instead of chemsex). However, users started modifying words, writing 'ch3m' and 'p4rty' for example, to still get the message across in a form of coded language (Patten et al., 2020). Censoring efforts may potentially contribute to further stigmatization and increased risk-taking actions (Patton et al., 2020).

Conflicting results were achieved in terms of engagement with health resources in the context of HIV testing (Wang et al. 2018), also described as having a positive correlation with age and a single relationship status (Hermosa-Bosano et al., 2021b). Some studies suggest a similar prevalence of HIV was found between app users and non- users (Zou & Fan, 2017). GBMSM were described as using multiple methods to decrease HIV, including combining use of pre-exposure prophylaxis (PrEP) when having unprotected anal intercourse (UAI) and doing so solely with HIV-positive individuals with undetectable viral loads (Queiroz et al., 2017).

GNDAs users were also associated with higher levels of intake of PrEP, despite its low general uptake. Because of this, a study suggested they were less likely to test HIV positive. Users were also found to be more likely to initiate PrEP after a testing encounter (Hoenigl et al., 2020).

Positive associations were found between low smartphone battery, and short timeframe between matching and meeting and increased sexual risk behaviours, potentially related to the relative immediacy of the encounters (Ciocca et al., 2020; Queiroz et al., 2017; Castro & Barrada, 2020; Tomaszewska & Schuster, 2020). The facilitation of offline encounters with little effort offered by GNDAs may contribute to more impulsive behaviours in sexual behaviours (Bonilla-Zorita et al., 2021).

Discussions on HIV and SAI status prior to sexual encounters were found to vary, at times as low as 50 percent (Hermosa-Bosano et al., 2021b; Garga et al., 2021b), irrespective of dating app use (Garga et al., 2021a). Data on prevalence of SAI use in GNDAs users is inconclusive, with some studies suggesting a negative association. This could potentially be due to underreporting and undertesting (Dai, 2023).

Non-physical sexual interactions in the context of dating apps are also important, including textual, active and passive audio-visual ‘sexting’, namely the transfer of sexually explicit media via smartphones or other technological devices. These behaviours may allow for sexual interaction without the risk of HIV and SAI exposure, but also raise issues of dissemination of sensitive material, leading in some cases to stigmatization, extortion and harassment (Hermosa-Bosano et al., 2021b).

### 2.3.9 Perceived Risks and Benefits

Even though the literature tends to focus on the negative sequelae of dating

app use, benefits of GNDAs are many. In the context of LGBTIQ+, the cyberspace offers an alleviation of the difficulties encountered by this population in finding a casual or romantic partner in a largely heteronormative society, reducing the element of isolation, discrimination and accessibility issues to partners of similar sexual preferences (Zou & Fan, 2017; Wang et al., 2018; Obarska et al., 2020; Castro & Barrada, 2020; Patten et al., 2020; Bineau et al., 2021; Choi et al., 2021; Hermosa-Bosano et al., 2021a; Hermosa- Bosano et al., 2021b; Dhoest, 2022).

GNDAs may also act as a digital community, offering support to sexual minorities and subcultures in their quest for romantic, social and sexual expressions (Zou & Fan, 2017; Wang et al., 2018; Obarska et al., 2020; Castro & Barrada, 2020; Dhoest, 2022). In the case of novel or temporary migrants, GNDAs may offer an opportunity for social and romantic connection, which could help in developing a sense of belonging in the new country (Power et al., 2022).

Dating apps may therefore contribute to expand the users' connections, increasing the sense of well-being (Hermosa-Bosano et al., 2021a). They also allow space to establish mutual interests prior to opting to meet offline (Bineau et al., 2021). It is therefore imperative for the public health professional to be able to identify the myriad ways in which such technologies impact health and wellbeing of their users (Holloway et al., 2014).

GNDAs are also free, accessible and flexible, and are less time-consuming and less intimidating and laborious than traditional communication methods (Orosz et al., 2018; Castro & Barrada, 2020; Hermosa-Bosano et al., 2021a). They can also contribute to improvement in users' sexual self-confidence and acceptance (Hermosa-Bosano et al., 2021b; Dhoest, 2022), in the relative privacy of one's own device (Hermosa-Bosano et al., 2021b).

Unique features of dating apps are their portability and localizability, allowing real-time conversations and interaction with individuals who are close geographically. Moreover, the multimedia format of GNDA allows the simultaneous use of visual (photos and video) and textual (messaging) communication channels, with the added benefit of linking GNDA profiles to other social media accounts (Castro & Barrada, 2020; Patten et al., 2020).

However, negative sequelae have also been associated with GNDA use. Their exponential growth in popularity brings forth privacy, security and intimacy concerns, including leakage of personal data and ease of localization (Marston et al., 2020; Bonilla- Zorita et al., 2021; Liew et al., 2023). Privacy breaches have been reported with some apps, including disclosure of user location and postal codes, as well as hacking of user profile photos. Moreover, some dating apps have been reported to share user information with third parties, including advertising companies or partners, oftentimes without the knowledge and consent of the user (Marston et al., 2020).

Discriminative, aggressive or anti-social behaviours (e.g., ‘trolling’, namely using online comments or activities to deliberately insult or upset other users) may also have associated psychological sequelae. Other problematic online behaviours include ‘catfishing’, and ‘ghosting’ (Griffin et al., 2018; Marston et al., 2020; Hermosa-Bosano et al., 2021a). In the former, individuals form fictional online personas to chat and interact with other users; the latter involves the sudden and unexpected cessation of online contact. These have myriad repercussions in the context of digital communication and intimacy (Marston et al., 2020).

GNDA use is also correlated to excessive body image concerns and associated behaviours, some of which may be negative and even pathological



(Marston et al., 2020; Lamont, 2021; Hermosa-Bosano et al., 2021a; Blake et al., 2022), occasionally associated with negative mood (Portingale et al., 2022). These may also be related to unhealthy weight control behaviours, body dissatisfaction and disordered eating (Tran et al., 2019; Blake et al., 2022; Portingale et al., 2022). Dating apps may trigger maladaptive eating patterns through dysfunction in self-evaluation (Portingale et al., 2022).

Dating apps have also been described as superficial and associated with objectification of self and others (Bonilla-Zorita et al., 2021). This may be due to their intrinsic nature, where initial contact is purely made based on visual appeal (Marston et al., 2020; Lamont, 2021). Swipe-based GNDAs, such as Tinder offer little information apart from the user's profile picture (Blake et al., 2022).

Some studies found this to be more prominent in men rather than women, potentially due to the abundance of studies on dating apps in GBMSM (Castro & Barrada, 2020; Tomaszewska & Schuster, 2020). Additional studies suggest that females are more prone to sub-clinical disordered eating (Blake et al., 2022). Others found no association at all (Barrada & Castro, 2020).

Episodes of sexual victimization have also been correlated to GNDA use; stigma and discrimination are occurrences which are unfortunately common in digital spaces, including GNDAs (Ciocca et al., 2020; Castro & Barrada, 2020; Marston et al., 2020; Lamont, 2021). These may be more prominent in dating apps, given the availability of GNDAs which cater for many various sexual preferences (Marston et al., 2020). This may be less recognized in males, with ensuring lack of protective mechanisms by users (Tomaszewska & Schuster, 2020; Choi et al., 2021).

Recent literature suggests that excessive use of GNDAs may be associated

with lower social and psychological outcomes; addictive behaviours have also been reported. Dating app users have also been linked to reduced sleep quality and duration, the latter also related to depressive symptoms (Quiroz et al., 2017; Obarska et al., 2020). Compared to non-users, dating app users have also been found to have lower reported life satisfaction and community belonging and higher levels of isolation (Obarska et al., 2020; Castro & Barrada, 2020).

Other mental health sequelae include the identification of an inverse relationship between degree of sharing of private information on dating apps and feelings of loneliness. Curiously, GBMSM who utilize dating apps for sexual relations reported a higher level of self-esteem and life satisfaction. On the contrary, individuals who use GNDA for intimacy (whether romantic or platonic) led to feelings of frustration, potentially due to GNDA norms being incongruous to traditional forms of forming such bonds (Obarska et al., 2020; Castro & Barrada, 2020; Hermosa-Bosano et al.; 2021a).

A novel concept is that of problematic GNDA use, which taps into persistent dating app use for short-term gratification purposes and exhibiting addictive behaviours (Bonilla-Zorita et al., 2021; Bonilla-Zorita et al., 2023). Addiction to social networking sites has previously been described (Kuss & Griffiths, 2011). Their ubiquitousness increases user numbers, which can lead to more prolonged, excessive use. Since comparable user interaction design features (such as swiping, scrolling, tapping and liking) are present between social media and dating apps, similar associations with addictive behaviours can be present. However, due to the dearth of research surrounding this, extrapolations are limited (Bonilla-Zorita et al., 2021).

Some research has investigated associations between problematic GNDA use

and various motivations and user characteristics. GNDA use for self-esteem enhancement, where the individual uses dating apps for external appreciation or to feel better about themselves, to find sexual partners and to seek a romantic relationship have all been linked to problematic GNDA use (Orosz et al., 2018). This was not the case for individuals who use dating apps as a distraction and boredom mitigation (Orosz et al., 2018).

Other studies have suggested that the higher the dating app use time, the higher the level of craving. However, notifications were associated with positive outcomes for users, possibly suggesting successful short- or long-term goals (Bonilla-Zorita et al., 2023). Some studies found no apparent link between sociodemographic characteristics of GNDA users and problematic use (Liberacka-Dwojak et al., 2023).

Different risks may be applicable to different sub-populations, including older individuals and young LLTCs, who may not be as acquainted with novel technologies and apps in the former and who due to potential paucity of experiences in the latter may put themselves in potentially risky situations (Marston et al., 2020).

In terms of perceived risks related to SAIs in GBMSM, they were found to be more significant for HIV than the other SAIs, due to the associated stigma and perceived permanence of the condition (Choi et al., 2021). Studies suggest that perceived risks of having unprotected sexual intercourse, having multiple partners and sex under the influence of alcohol and recreational drugs may be higher in GNDA users.

### 2.3.10 Dating Apps and Health Promotion

With the advent and exponential growth of digital technologies, individuals have

been increasingly utilizing smartphones to search for health information online, including sexual health (Holloway et al., 2014; Amante et al., 2015; Power et al., 2022). The use of smartphone apps, specifically GNDA as alternative, non-traditional platforms in the dissemination of health-related information has been investigated in this regard.

The creation of novel sexual health apps has been shown to have its constraints, with infrequent downloads, low user ratings, and difficulty reaching target populations plaguing their effective use (Muessig et al., 2013). Integration of established and popular apps with health promotion could be more advantageous in this regard, particularly so in terms of targeting populations with difficult access (Goedel & Duncan, 2015; Holloway et al., 2014; Huang et al., 2016; Hoenigl et al., 2020; Bineau et al., 2021; Ren et al., 2021; Liberacka-Dwojak et al., 2023; Dai 2023). The use of GNDA in health promotion also has the benefit of being inherently discreet (Holloway et al., 2014). Interventions should aim to be convenient, comprehensive, unobtrusive and respectful of community culture whilst establishing rapport and credibility with GNDA users (Jenkins Hall et al., 2017).

The added benefit of geolocation allows the potential to tap into the real-time geospatial aspect of dating apps, utilizing GPS to give real-time information about services available according to user's actual physical location. This has been found to be acceptable by users in several studies (Huang et al., 2016; Zou & Fan, 2017; Sawyer et al., 2018). This type of intervention can be expanded to include reminders about regular testing and adherence to medication, when applicable (Holloway et al., 2014).

Sexual health information can also be linked spatiotemporally to popular events or festivals, so that health promotion information can be targeted to attendees in a

particular location where GNDA use is expected (Garga et al., 2021a). This also has implications for individuals living in rural areas where education and care may be limited (Bineau et al., 2021).

Sexual health content in dating apps is relatively scarce, mostly targeting GBMSM (Huang et al., 2016; Tavares et al., 2020). Several methods of providing sexual health information can be identified. These include pop-up messages, links to sexual health information or services (Huang et al., 2016; Hermosa-Bonsano et al., 2021b; Goedel et al., 2021) and identification of SAI status and safe sex preferences (Huang et al., 2016; Hermosa-Bosano et al., 2021b; Dai, 2023).

The acceptability of pop-up messages may be dependent on their timing and frequency and links to reputable sources may have a reduced response rates than information provided on the actual dating app (Huang et al., 2016). Some studies have indicated a preference towards banner advertisements and direct messages to inboxes (Goedel et al., 2021). Pre-written messages asking about SAI or HIV status may also be a potential avenue to use, with aims at normalizing such conversations (Chadwick et al., 2023).

Having automated interventions may also be disadvantageous in that they can be less effective and potentially stigmatizing (Jenkins Hall et al., 2017; Hoenigl et al., 2020). The prevalence of bots and fake identities may also hinder effective health information dissemination in this manner. An alternative would be having a real health educator on the dating app, which users may be more comfortable reaching out to (Jenkins Hall et al., 2017). Another option would be having personalized dissemination of health prevention messages on profiles of opinion leaders (Hoenigl et al., 2020).

Declarations on SAI status are dependent on knowledge of active status, willingness to disclose such information and accuracy (Huang et al., 2016; Hermosa-Bosano et al., 2021b; Chadwick et al., 2023). It may also be potentially associated with ostracization (Huang et al., 2016). This may also promote partner selection or rejection based on serostatus. Moreover, users may overlook profile information or confuse information between different profiles. The option to leave a blank HIV status can also lead to confusion which may have significant sexual health sequelae (Chadwick et al., 2023). A potential avenue for provision of sexual health information is the purchasing of advertisements spaces in dating apps, which would target the individuals making use of the dating apps in the free mode but would not target individuals who opt to use dating apps by upgrading to a premium membership (Huang et al., 2016). A recent study showed that incorporation of risk assessment and customized feedback significantly increased HIV testing (Luo et al., 2023).

Messages aimed at intervention should be aesthetic and visually appealing (Holloway et al., 2014; Dai, 2023), with the major aim being that of harm reduction, with accentuation of SAI testing and contraception use rather than targeting psychological predictors of risky sexual behaviours. Self-learning algorithms may then play a role in targeting such predictors. Natural language processing may identify such predispositions in real-time, even predict them (Dai, 2023).

The utilization of provocative visual media has also been considered. Some argue that these are appropriate for the cultural contexts of the GNDAs on which they are to be displayed. Others state that utilization of such imagery would further solidify the promiscuous stereotype given to GBMSM (Goedel et al., 2021).

Given the hidden nature of sexual health activity within dating apps, another potential avenue to consider is the concept of biocommunicability. This incorporates

the understanding of novel communication media (as in the case of GNDAs) and the general discourse on dating apps on mainstream media to highlight salient public health issues. The development of health literacies can then ensue, which may effectively address the stigmatization and tendency to lean towards the negative connotations linking dating apps with increased health risks. The end-result is more meaningful and effective health promotion strategies and interventions (Albury et al., 2020). Other potential avenues where dating apps may also be used is in recruitment of at-risk or target populations in research and spreading a public health message within a targeted sub-population (Choi et al., 2016; Zou & Fan, 2017; Sawyer et al., 2018; Tavares et al., 2020; Bineau et al., 2021; Garga et al., 2021a) or targeting dating apps which are popular for arranging casual sexual encounters (Bineau et al., 2021). Moreover, incorporating general discourse in mainstream media can in turn highlight salient public health issues (Albury et al., 2020).

Limitations in striking such partnerships may however be present, with reservations from official entities in working with GNDAs which are notoriously associated with promoting 'hook-ups'. The reverse can also occur, with app developers having hesitations incorporating sexual health information for fear it may act as deterrent (Holloway et al., 2014).

Utilizing smartphone apps, particularly GNDAs, as tools in the public health promotion arsenal can act as a high-impact, cost-effective means of bringing sexual health into the digital age.

### 2.3.11 Research Lacunae

Research on dating apps has pressed forwards in the last couple of decades, analogous to the exponential rise in their popularity and acceptability. Studies range over a broad and highly varied span of health and ancillary sociocultural outcomes,

looking into numerous dating apps and individual nuanced experiences and behaviours, which may vary considerably.

The public health outcomes and implications of dating app use are many; this literature review attempted to condense and categorize them in a manner that was in line with the aims and objectives set at the outset. As previously alluded to, research gaps at a supra-national and local level are distinct, in that the knowledge base is vastly different.

On a supra-national level, most of the research carried out on GNDA's focused on negative aspects or detrimental health sequelae of their use. Similar focus on the specific virtues of dating app use should also be investigated in the future, particularly on the positive role of dating apps on relational and sexual outcomes. This could in turn aid in the formation of a counterstereotype to dating apps use being solely a vessel for risky health behaviours, which could potentially be an oversimplification of GNDA outcomes. A more nuanced approach to future dating app research would be the comparison of user characteristics and associated outcomes between the various GNDA's available. Another area of interest is the identification of the depth of the relationship between user characteristics, actual GNDA use and outcomes.

Most of the research highlighted focused on GBMSM, with a recent increase in the data on heterosexual users. However, there is still a dearth of information on non-heterosexual women as well as specific sub-groups of people, including older adults or individuals with disability or LLTC.

Prevalence of dating app use has also been long disputed and could be further assessed. Research has also mostly focused on the global north; future attempts



should also investigate other low- and middle-income countries, with particular focus on conservative communities and the implications of migration on dating app use. Similarly, there is also a dearth of temporal and longitudinal research on dating apps. This may highlight changing patterns, practices and motivations, particularly when comparing to controls (non-users) and could contribute to the determination of directionality and causality. Moreover, when considering risks and benefits, a more confluent approach to related research can be taken. Benefits and risks could be deemed not as finite variables, but a comparative assessment done by the user is done prior to engaging in a particular behaviour. For example, the benefit of extending social and romantic networks may come at a cost of a certain degree of privacy loss.

The expansion of research to investigate the role of social media as dating apps in their own right can also be carried out. Greater work is needed to explore the barriers and needs that govern the use of dating apps, as well as focusing on the changing dynamics of dating app use along the life-course. Similarly, the role of class and ethnicity should also be considered. This may in turn help elucidate the evolution of online dating use and help capture its diversity. There is paucity of knowledge on the novel aspect of problematic dating app use. The links between social media and the internet and mental health sequelae are currently being defined. Analogous investigations could be carried out on the potential problematic and addictive properties of dating apps, and their associated implications.

Further research on the phenomenon of dating apps and digital social media can also aid in their utilization for dissemination of sexual health education and preventative information is also warranted, particularly so in the heterosexual community. The Maltese evidence base on dating apps is noticeably deficient, despite alluding to their popularity on multiple cultural media platforms and grey literature and identifying it as

an important consideration for ensuing research.

Considering the dearth of information surrounding the topic, any evidence-based information collected on the subject matter can be useful to direct future efforts. This dissertation shall focus on the collection of basic information on dating app users via their characterization and associated knowledge, attitudes, and behaviours. The information gathered can then act as a gateway to build the local knowledge base which will allow correlation of trends to other countries at a European and global level.

### 2.3.12 Synthesis of Findings

Original studies suggested that dating apps were mostly used by young Caucasian GBMSMs. However, these have become more mainstream with time, with ubiquitous use across sociodemographic strata. Despite a single relationship status being one of the strongest predictors of GNDAs use, a considerable number of users having a partner were also found to be active users. Gender stereotypes have also been challenged, with active female users increasing with time.

The stereotype of dating apps being used solely for casual sexual encounters has also been challenged. Research has shown that motivations for use vary widely, ranging from friendship, social connection, companionship to distraction and self-esteem enhancement, with sexual encounters being only one.

Users were found to be very familiar with dating apps, some with multiple profiles on different apps. Usage patterns vary widely, mostly using GNDAs in the evenings during weekdays and during weekends.

GNDAs have been repeatedly linked to increased risky sexual behaviours, but also with increased protective behaviours. Further studies are needed to prove causality and directionality, particularly when looking at the combination of sex,

recreational drugs, and alcohol.

Despite research mostly focusing on the negative aspects of dating app use, benefits are multiple. These include building a sense of community, immediacy and portability, with the added benefit of geospatial location. However, risks related to GNDA use are present which include privacy and security issues, sexual victimization, online anti-social behaviours and excessive body image concerns.

There is significant potential in the use of dating apps for health promotion purposes and is advantageous in myriad ways. Research lacunae at the supranational and national level are distinct, with a noticeable difference in the absolute body of work available. Whereas there is relatively broad information available in the former, there is a considerable information dearth in the latter, which in turn guided the focus and information to be collected in this exploratory study.

## 3 Materials and Methods:

### 3.1 Overview

This chapter will provide an outline of the methodology utilized and the process undergone to answer the research question. It will include a discussion of the research layout, tool development and related validity and reliability tests. This chapter will also consider the sampling method and attributes of the population selected. Ethical approval, data acquisition and ensuing analysis will also be discussed, together with the strengths and limitations of the research design.

### 3.2 Research Design

In view of the novelty and sensitive nature of the subject matter, and the context of the local sociocultural scenario, a descriptive, exploratory study was identified as the most appropriate means to attempt to answer the research question. Data was collected using a quantitative tool in the form of an online anonymous self-administered questionnaire distributed via the social media website Facebook.

This was aimed at analysing the sociodemographic characteristics of dating app users, and their associated knowledge, attitudes, and practices and how these in turn influence sexual behaviours, risk-taking and romance-seeking habits. This could then contribute to the formation of a contextual portrait of the phenomenon of dating apps in the Maltese islands, enriching knowledge on the subject matter in the process, whilst allowing for more effective and targeted sexual health information campaigns that reflect the nuances of the current digital era.

#### 3.2.1 Sampling Method

The sampling method chosen to best answer the research question and associated aims of the study was an anonymous self-administered descriptive

online survey, distributed via the social media site Facebook through paid advertisements and posts through popular Facebook pages in the Maltese islands. This was done to reach as many respondents with varied sociodemographic backgrounds as possible. Care was taken to ensure that the Facebook pages chosen did not target specific demographics to prevent potential bias. No incentives were given for questionnaire completion. The utilization of this social media portal was thought to be superior to the direct use of dating apps for recruitment, as done in some studies abroad. This is in view of the absolute dearth of local information, where opting for the latter could potentially lead to certain postulations which may not be reflective of the actual dynamics.

Given the delicate nature of asking about intimate and sexual practices, the sampling technique opted for is a non-probability (convenience) sampling, where individuals choose to complete the survey out of own volition. The advantages of such a sampling method includes its cost-effectiveness, ease of implementation and efficiency, and utility in developing hypotheses (Vehovar et al., 2016; Stratton, 2021). The latter is an important consideration in this study, which is exploratory in nature, compounded by the absence of similar studies on the subject matter in the Maltese islands. This implies that the preferred probability sampling could not be effectively used.

The inherent limitations of such a sampling method on the other hand, include the inability to carry out formal statistical inferences and other generalizations, and the inability to determine direction of magnitude and directionality of any associations identified (Vehovar et al., 2016; Stratton, 2021). There is also the potential for an element of selection bias, where those who opt to complete the online survey may not be representative of the dating app user population, the degree of

which cannot be assessed, and vice-versa, with non-response bias. Another bias to consider is recall bias, which may affect accuracy of respondent recollection (Andrade, 2020; Singh & Sagar, 2021).

The choice to utilize an anonymous self-administered questionnaire also has its benefits. Given the sensitive nature of the subject matter, the anonymity of the survey may considerably improve accurate truthful responses, albeit an element of social desirability bias may still be present. This may be particularly true when answering questions on sexual practices deemed risky or perceived as contemptible. Self-reported data is commonly used in behavioural studies. In view of the novel nature of the study, there was no single tool which elegantly fit the aim and objectives where possible, questions were adapted from previously employed research tools. This was done to increase the validity and reliability of the quantitative tool of choice (Andrade, 2020; Singh & Sagar, 2021).

The major reason behind the selection of an online survey as the data collection tool of choice is the intrinsic nature of the topic under investigation. Most of the quantitative studies in the literature review analysing variables related to dating apps also utilized online surveys as their preferred sampling method. Opting for other conventional sampling methods could have led to under-representativity and potential bias.

Online surveys are convenient and speedy; their automaticity allows for complex logical trees, also known as 'go to' properties, thereby allowing for more advanced collection of data. Another advantage is the required completion of survey questions, thereby limiting considerably invalid responses (Nayak & Narayan, 2019). However, drawbacks include their impersonal nature and links to low response rates. These may be sensitive to content, length and wording of surveys,

incentives, and researcher identity (Galesic & Bosnjak, 2008; Hansen & Smith, 2012; Evans & Mathur, 2018).

There is a considerable potential confluence between social media and dating app use. The assumption is made that the individuals using dating apps likely also have access to Facebook and have the same digital literacy level to navigate both. Utilizing Facebook as a proxy recruitment portal for dating apps was considered appropriate due to both being digital technology elements. A 2023 Social Media Usage Report suggested that 90 percent of internet users in Malta access online social media networks at least once daily, with Facebook dominating daily social media use across all age groups, despite decreasing slightly with increasing age (Misco, 2023).

The same report suggested that internet users are becoming increasingly conscious of targeted advertisement on social media platforms, built on individual browser history (Misco, 2023). Therefore, dispersion of the questionnaire via Facebook using paid advertisements was deemed as the most appropriate method to answer the research question. Such an advertisement was used to target dating app users who were navigating Facebook.

Facebook has also been investigated for scientific robustness as a method of recruiting participants (Thornton et al., 2016). Most studies (86 percent) showed similar representative rates as those achieved by conventional methods; suggesting that using Facebook as a recruitment portal was an effective means of collecting data.

Some considerations identified include the over-representation of individuals with higher educational attainment and potential issues with age and gender bias (Thornton et al., 2016). The latter was also confirmed by the 2023 Social Media

Usage Report which highlights a slightly higher proportion of female social media users (93 percent) compared to males (88 percent) (Misco, 2023); reversed in a 2023 Meta report (47.7 percent female; 52.3 percent males) (Kemp, 2023). No formal data was available in terms of user base composition of the popular Facebook groups selected.

This is an inherent limitation, which could have an impact on the representation and validity of the sample via its recruitment and actual responses. Whilst searching for related studies, the utilization of Facebook and other social media platforms have also been identified as a popular choice as a recruitment portal for dating app users.

### 3.2.2 Population

Dating app users aged 18 years or over (previous or current) who are currently living in Malta were eligible for this study. The ages included aimed to represent the proportion of the Maltese population, which is deemed to be digitally literate, of reproductive potential and to be actively seeking connections through dating apps. This variable was divided in five years for the youngest cohort (18 to 24 years), and ten-year ranges after, till 49 years of age.

The splitting of the youngest cohort was done to give a more contextual analysis to the age group the literature repeatedly suggests is the one which uses GNDAs the most (Anzani et al. 2018; Castro & Barrada, 2020). The 30–49-year age groups were also included as these capture the individuals who would be potentially using GNDAs to seek connections after dissolution of a long-term relationship.

However, dating apps are also increasing in popularity in the senior (>65 year) age group (Smith, 2016). The 50+ age group was collated together to reduce any



perception of identifiability. A cut-off at 74 years was applied, in line with the results published from NSO's 2022 ICT Usage by Household Report, which suggest that 91.5 percent of individuals aged 16-74 were internet users (NSO, 2023b).

The study also aimed to reflect the recent significant demographic changes in the Maltese islands as highlighted by the latest intercensal NSO release which states that the share of foreign nationals increased from 5.5 to 25.3 percent between 2012 and 2022 (NSO, 2024). This was done by introducing a question which specifies the country of origin of respondents.

### 3.2.2.1 Inclusion and Exclusion Criteria

To be included in the study, the participant had to be over 18 years of age, a current resident of the Maltese islands and a previous or current dating app user. Younger ages were excluded from the study due to ethical and legal considerations. Prior to participation, eligible respondents were asked to declare they were adults and were required to provide informed consent prior to accessing questionnaire. Respondents who stipulated they were not dating app users were also excluded from the study. The lack of assessment of non-users also implies that prevalence of dating app use cannot be estimated. However, a detailed analysis of dating app users was analysed and deemed to answer the research question and defined aims adequately.

### 3.2.2.2 Sample Size Calculation

Given that the population of individuals residing in Malta who are over 18 years of age, and active or previous users of dating apps cannot be estimated (unlimited population), the sample size is calculated using the following formula:

$$n = \frac{z^2 \times \hat{p}(1 - \hat{p})}{\epsilon^2}$$

Where,  $n$  is the sample size,  $z$  is the  $z$ -score (1.96 for a confidence interval (CI) of 95 percent),  $\hat{p}$  is the population proportion (denoted as 0.5 or 50 percent for an unlimited population).  $\epsilon$  denotes the margin of error. Assuming a maximum margin of error of 10 percent, the smallest sample required to ensure representativity is 97 respondents.

The CI is the parameter which defines the probability range (95 percent in this study) within which the real value of the actual population lies. The population proportion ( $\hat{p}$ ) represents the distribution of the population (0-1), the mid-point of which (0.5 or 50 percent) represents a normal (Gaussian) distribution. In the context of limited information on the population, a value of 0.5 is the most conservative estimate. This maximizes the required sample size, ensuring sufficient precision irrespective of the true population proportion. The margin of error represents the inherent distinction between the sample and actual population.

### 3.2.3 Study Tool Development

To be able to successfully address the research aims and objectives, a questionnaire aimed at assessing the knowledge, attitudes and practices of dating app users was required. A pre-existing, validated tool was not available; therefore a literature search was carried out to enable the formulation of such an instrument, with particular focus on the tools used to assess variables of interest for this study.

Two validated tools were utilized in the development of the final questionnaire. These included applications of the Tinder Motives Scale (TMS) (Timmermans & De Caluwé, 2017b) and the questionnaire provided by Garga et al., during their assessment of GNDA and risky sexual behaviours during a music

festival (Garga et al., 2021b). The original tools can be found in Appendix B and C respectively.

Multiple classifications denoting motivations behind dating app use have been devised (Orosz et al., 2016; Ranzini & Lutz, 2017; Sumter & Vandebosch, 2019). However, the scale opted for in this dissertation is an adaptation of the tool developed by Timmermans and De Caluwé, which appraises 13 motives behind GNDA use. (Timmermans & De Caluwé, 2017b). This version was chosen in view of it being the tool of choice in multiple studies and being the tool which offered the broadest motivational aspects, deemed to be ideal in the context of an exploratory study.

The risky sexual behaviour aspect of the questionnaire was obtained from a study carried out during a music festival (Garga et al., 2021b) which allowed for the simplification of the extent of risky sexual behaviours and which had the potential to account for local sensitivities and cultural practices and which was readily available. Other quantitative tools were limited in availability.

In terms of knowledge of SAIs and associated sexual health services, there was no available tool, validated or otherwise, which catered for this requirement. The information listed was therefore obtained from the Sexual Health Malta website sexual health website 'Sexual Health Malta' under the 'STIs' and 'Services' section (Health Promotion and Disease Prevention Directorate, 2021). Appraisal of the perceived risks and benefits was derived from the compound analysis of the literature.

The final format of the questionnaire was divided into various segments, aimed at assessing the knowledge, attitude and behaviours of dating app users. This was done by investigating the user characteristics, motivations behind GNDA use, usage

patterns (including dating app used, frequency of use and types of offline encounters), sexual health knowledge and behaviours and perceived risks and benefits of GNDAs use.

Respondents were also asked about suggestions on how dating apps can be improved from a sexual health perspective. This aims to act as a proxy for acceptability of sexual health intervention campaigns targeting GNDAs.

### 3.2.3.1 Assessment of User Characteristics

The assessment of user characteristics is vital to be able to give a contextual approach as to who is using GNDAs and to assess whether certain sociodemographic features are associated with specific usage patterns, motivations, sexual behaviours and knowledge and perceived risks and benefits.

The variables assessed include age, gender, sexual orientation, educational attainment, country of birth, relationship status and sexualities and relationships education.

### 3.2.3.2 Evaluation of Motivations - The Tinder Motives Scale (TMS)

The Tinder Motives Scale (TMS) is a quantitative tool developed in 2017 to assess motivations behind Tinder use. This was done using the Uses and Gratifications (U&G) media theoretical framework, commonly used by media scholars to investigate how media are used to fulfil the expectations of various users with distinct expected outcomes (Katz et al., 1973). It postulates that users play an active rather than a passive role, utilizing and selecting media which will serve as a platform to achieve a certain social or psychological outcome.

It implies that there are distinct motives which lead the user to access media

to seek specific gratifications through particular behaviours. Once met, the user will again depend on media to meet their needs (Timmermans & De Caluwé, 2017b).

Despite the availability of multiple dating app motive scales (Orosz et al., 2016; Ranzini & Lutz, 2017; Sumter & Vandenbosch, 2019), an adaptation of the TMS was opted for this study, in that it contained the widest variety of motives behind GNDA use (Timmermans & De Caluwé, 2017b).

The final TMS is a 58-item scale which explores 13 different motives for Tinder use. These include social approval, relationship seeking, sexual experience, flirting/social skills, travelling, ex, belongingness, peer pressure, socializing, sexual orientation, pass time/entertainment, distraction, and curiosity (See Appendix B).

Following cognitive question testing during piloting, it was decided that the incorporation of the original 58 items in the final version of the questionnaire in this study would lead to the tool being too protracted, potentially leading to survey fatigue and reduced response rates. Upon searching the literature, no concise version of the TMS was available. It was therefore decided that the 13 TMS Factors (dimensions) would be included instead, with the aim of gathering data on motivations behind dating app use in the Maltese islands. This was freely available online.

### 3.2.3.3 Analysis of Usage Patterns and Sexual Behaviours

To be able to assess awareness of and actual risky sexual behaviours and usage patterns appropriately, the tool developed by Garga et al., in their 2021 study assessing risky sexual behaviours and GNDA's was used (Garga et al., 2021b). The original survey can be found in Appendix C.

This tool was developed with the help of sexual health and public health

experts and includes questions on sociodemographics, dating app use, sexual behaviours, and risk perceptions. Adaptations of the original Safer Sex Behaviour Questionnaire (SSBQ) (Dorio et al., 1992) were done to develop questions on GNDAs, sexual health and usage patterns (Garga et al., 2021b).

Usage patterns were assessed in terms of number of dating app used and the frequency of usage. The type of offline encounters after initial contact via GNDAs was also assessed. The popularity of GNDAs will also be evaluated.

Assessment of sexual behaviours included gathering information on number of sexual partners, the type (if any) of regular contraceptive used and questions on the association between perceived risk and actual behaviours relating to sexual encounters whilst under the influence of alcohol, sex with people who had injected drugs or who had an SAI. The aspect of discussion of SAI status and other boundaries prior to sexual engagement was also assessed (Garga et al., 2021b). The research team was contacted and approval for utilization of questionnaire for this study was gained (See Appendix D)

These questions were further contextualized via the addition of two questions asking the study respondent of their knowledge of various SAIs and sexual health services offered in the Maltese islands. The options given in the study were the ones listed in the national sexual health website ‘Sexual Health Malta’ under the ‘STIs’ and ‘Services’ section (Health Promotion and Disease Prevention Directorate, 2021).

Following the introduction of PrEP in Malta in May 2019 in the community via the availability of the generic product in various pharmacies across the Maltese islands (The Malta LGBTIQ Rights Movement, 2019), coupled by reports of reduced uptake abroad (Hoenigl et al., 2020), it was decided that the survey tool should also

include an assessment of the degree of regular PrEP uptake amongst respondents.

A further question on considerations following sexual intercourse was also included in the final survey design. This query has the aim of identifying the perceived importance of individuals post-sexual encounter, which could help further elucidate areas which could act as future focus of health promotion campaigns.

Both the questions derived from the tool developed by Garga et al., and the information assembled from the Maltese national sexual health website on SAIs and available services were developed with the aim of assessing the distinct sexual health knowledge and behaviours and usage patterns of GNDA users and their inter-relationship.

#### 3.2.3.4 Appraisal of Perceived Risks and Benefits

In view of the multiple identified positive attributes of GNDA and associated paucity of literature, additional questions were included in the study to assess this. These aimed at looking into perceived positive attributes of dating apps which were listed in the literature. These include accessibility, ease of use, ability to be used anywhere, the capacity of GNDA to offer dating in an approachable manner, also for individuals with various levels of ability (Zou & Fan, 2017; Wang et al., 2018; Obarska et al., 2020; Castro & Barrada, 2020; Patten et al., 2020; Bineau et al., 2021; Choi et al., 2021; Hermosa-Bosano et al., 2021a; Hermosa-Bosano et al., 2021b; Dhoest, 2022).

Analogously, analysis of perceived risks of GNDA use not directly related to sexual health behaviours and sequelae were also included in the final research tool, after being identified as being variables of potential influence (Griffin et al., 2018; Marston et al., 2020; Bonilla-Zorita et al., 2021; Hermosa-Bosano et al., 2021a; Liew

et al., 2023). These aimed to assess privacy, intimacy, and security issues, as well as any effect of dating apps on self-esteem and self-worth, and physical appearance. These questions are aimed to assess the perceived risks and benefits of GNDAs of users residing in the Maltese Islands.

### 3.2.3.5 Validity and Reliability Testing

The finalized questionnaire underwent face validity testing, aiming at ensuring that it effectively captures the data it purports to measure. This was attained via consultations with medical doctors, dating app users, public health specialists and specialist nurses, through expert evaluation, ensuring that the survey items cover the aim and objectives comprehensively. This also acted as an assessment of content validity.

Since the online survey was to be disseminated to individuals of varied educational attainment, it was decided that the questionnaire would also need to be made available in the Maltese language to reduce any selection bias due to potential respondents opting out of completing the survey due to language preferences. The finalized questionnaires (in Maltese and English) can be found in Appendices E and F respectively.

Reliability testing was also carried out by asking a select group of individuals to answer the questionnaire twice (test-retest reliability) on two separate occasions after allowing three weeks to pass. Minimal changes in responses were noted. Estimated time of completion was set at 12 minutes, which was deemed acceptable and did not lead to survey fatigue.

Validity testing was done to the best feasible extent in the context of a subject matter surrounded by a dearth of local information, maximising its potential to gather



the information it strived to in an effective manner, taking into account local cultural nuances and associated sensitivities.

### 3.2.3.6 Pilot Testing

Pilot testing was carried out on the survey tool among eleven voluntary respondents to assess for appropriate comprehension, complexity and overall length of the research tool. Respondents were advised not to participate in the main study, as to limit potential bias.

Feedback was then collected from participants, along with their comments on the clarity and relevance of the questions. A preliminary analysis was carried out to identify any issues with the survey items. Minor modifications were done to the survey following pilot testing. These included a better flow of the sequence of questions. In the earlier version of the result, the more sensitive questions pertaining to the respondents' sexual behaviours were located after the initial sociodemographic questions, which were deemed to be inappropriate, and it was suggested that the respondents should work their way to the more sensitive queries. These were then placed in the latter part of the survey.

Other minor changes included opting for different grammatical words in Maltese which would avoid ambiguity or understandability. An example included the addition of the word '*droga*' next to '*sustanzi illeciti*' to aid in question comprehension. Other minor grammatical changes were suggested and effected.

## 3.3 Ethical Considerations

### 3.3.1 Ethical Approval

The Faculty Research Ethics Committee (FREC) of the Faculty of Medicine and Surgery at the University of Malta was provided with the appropriate

documentation and ethical clearance with conditional approval to carry out the study was obtained on the 20<sup>th</sup> of March 2023 (Reference Number: MED-2022-00421). Refer to Appendix G.

Despite dealing with sensitive topics, escalation to the University of Malta's Research Committee (UREC) was not deemed necessary in view of complete anonymization of respondents and the procurement of a declaration of informed consent and confirmation of age prior to progression to online survey.

Dr. Sabrina Pit did give her consent for utilizing the questionnaire used in the 2021 Garga et al., study (Garga et al., 2021b) (Refer to Appendix D).

### 3.3.2 Informed Consent

Prior to accessing online survey questions, interested potential respondents who clicked on the link provided in the Facebook posts were directed to an introductory page.

This provided information on the scope of the study, with particular focus on rationale behind any personal questions and expectations and roles of the respondents. Emphasis on the voluntary nature of participation was ensured; respondents were assured they do not need to provide reasons for non-participation and that should they opt out, no negative repercussions would ensue.

The recruitment page also provided salient information on data management and adherence to confidentiality and anonymity standards provided by the General Data Protection Regulation (GDPR) legislation, including the duration of retention of data pertaining to questionnaire responses. Contact details of the researcher and supervisor were made available for any potential queries or clarifications (Refer to Appendices E and F)

### 3.3.3 Safeguards and Sources of Help

Since the questionnaire investigated aspects of sexual behaviour and potential mental health sequelae of the use of dating apps, information and contact details on reputable national services were provided for the respondent's consideration. These included contact details of the national GU Clinic and Psychological Support Service providing mental health aid at all hours. A link for the national sexual health website was also provided for ease of access.

### 3.3.4 Anonymity and Confidentiality Considerations

Some of the data collected meets the criteria of Special Categories of Data (SCPD). Questionnaire respondents were asked questions pertaining to their sexual practices, sexual orientation and which (if any) contraception/s are used regularly. Data on knowledge of sexually acquired illnesses and local services, perception of risky sexual behaviours, actual sexual practices and motivations behind use, frequency and attitudes behind dating app were also collected and analyzed. Identifiable information was not collected.

Data granularity was limited by opting for identification of country of birth, rather than residential regions. This was done to be able to extract potential cultural implications on sexual health knowledge, attitudes and behaviours, but also to limit identifiability. Data was gathered responsibly and anonymously after respondent was informed of the contents of the questionnaire. Respondents were asked to verify understanding and to confirm they are above 18 years of age, after which they were asked to opt to enter or exit survey. Completion of questionnaire was taken as informed consent.

### 3.4 Data Acquisition Protocol

Data collection was effected between 16<sup>th</sup> October and 16<sup>th</sup> December 2023 via a self-administered anonymous online questionnaire disseminated via the social media portal Facebook. Dissemination was carried out via two distinct methods: a paid advertisement and posting on popular Facebook pages in Malta.

A business page with the name of the researcher was created, and a link to the online surveys (both Maltese and English) was posted together with a short summary introducing the scope of the study. A recurrent paid advertisement was purchased for one month (between 16<sup>th</sup> October and 16<sup>th</sup> November 2023), and the demographic features of the target population selected to ensure that the inclusion and exclusion criteria are met. The advertisement was purchased by the researcher without any exchange for sponsorships or affiliations.

Individuals who click on the link were then directed to a Microsoft Form sheet where the researcher and supervisor were introduced and information on the implications of the respondent's participation and ensuing data management protocols explained. The interested respondent is then asked to confirm their age and access to the ensuing questions then granted. It was ensured that the target population was clearly defined in the advertisement. However, should non-users still opt to click on the link provided and partake in the online survey, they were diverted appropriately.

To help improve the response rate, the same post shared on the researcher business page was also posted on popular Facebook groups in the Maltese islands to maximize the reach of the online survey. Generic groups followed by various genders and irrespective of nationality and sexual orientation were opted for instead. No incentives were given to promote survey response.

To ensure quality and transparency of the data collection process, interested survey respondents were provided with the contact details of the researcher and supervisor for any queries that may be present. As previously stated, individuals who clicked on the link were diverted to an information page where they were duly informed of the scope of the study and the estimated time of completion provided both in the advertisement post and in the introductory statements after clicking on the survey link.

Data was collected via the web-based tool Microsoft Forms. This tool does not collect or track IP addresses; data is encrypted in rest and in transit. Moreover, at no point was respondent data identifiable; the anonymous function of Microsoft Forms was used.

### 3.5 Approach to Data Handling and Analysis

#### 3.5.1 Data Management and Retention

After the data collection period elapsed, respondent data was transferred from Microsoft Forms to a Microsoft Excel sheet via the download function. The type of data collected was in the form of text, numeric symbols, and images. Metadata generated included response rate, duration of completion of survey, participation trend over time and language preferred. Multiple types of files were used including docx, xlsx, jpg, and pdf.

Data was anonymized from collection, but participants were assigned a number. No secondary sources of datasets were present. Data generated from the questionnaire was stored on a password-protected personal computer, accessed solely by the researcher. Back-up was also present online via the iCloud, which was also password-protected and only accessible by the researcher. No external drives

were used. Multifactor authentication was used at multiple access points, including iCloud.

Data collected will be stored till the publication of results, after which it will be erased. There will not be any official embargoes pertaining to data sharing. No commercial use will be allowed. If sharing the data will raise privacy, ethical or confidentiality issues in the future, further limiting of sharing of data will ensue.

### 3.5.2 Data Handling

Following transfer of data to a Microsoft Excel sheet, information collected was manually cleaned with the aim of optimizing and priming data for analysis. This activity involved the identification and rectification of identified errors or omissions (Maletic & Marcus, 2005).

Data cleansing involved critical scrutiny of the data collected. Categorization and presentation of variables into appropriate rows and columns ensued and responses listed in order. In cases where there were multiple options these were standardized and grouped into variables (Elliot et al., 2006). Text data was changed into numerical format in preparation for data analysis with Statistical Package for Social Sciences (SPSS).

### 3.5.3 Statistical Analysis

To be able to assess whether there were any meaningful associations from the information collected from the online survey, the data was statistically examined using IBM SPSS Statistics ® Version 29.0.2.0 (20) (IBM Corp, 2022) and graphical representations generated using Microsoft Excel 365.

The assumption could not be made that the characteristics of dating app users of the Maltese island are the same as that of the general population, since the information

collected was directed solely at dating app users. Weighting of results was therefore not applicable in this context. The assumption that age and gender proportions for the Maltese resident population in censal data was transferable to the age and gender proportions of dating app users could not be made judiciously.

However, the respondent data was statistically analysed and tested for significant associations at a cut-off *p-value* of 0.05. Normality testing was done when appropriate to assess sample distribution and ensure selection of the suitable statistical test (parametric versus non-parametric) was carried out. Since data on non-users was not collected, weighting of the results could not be carried out.

### 3.6 Conclusion

This chapter has explained the methodological process from its inception, through to data generation, management, and statistical analysis. The following section shall focus on the presentation of the main findings of the study.

## 4 Results:

### 4.1 Introduction

This chapter shall showcase the main findings of the study. The data will be presented first by looking at the survey findings and characteristics of responses. This will be followed by a sequential analysis of user characteristics, which include sociodemographic variables.

The outcomes of the study will then be discussed. These will in turn be correlated to the sociodemographic characteristics in turn. Finally, the different outcomes will be correlated together to see if there are any links between the different knowledge, attitudes and practices of survey respondents.

For analysis of two categorical variables, Fisher's exact test was utilized; a non-parametric test which is useful when dealing with small sample sizes in that it does not make assumptions about the distribution of the data. Given that the analysis has been carried out solely on dating app users, the conclusions made are valid solely for the sample populations and have limited generalizable and inferential power.

### 4.2 Features of Survey Responses

#### 4.2.1 Facebook Advertisement Campaign Metrics

The online survey tool was disseminated on the social media platform Facebook via a paid advertisement on a business page and through posts on popular pages and groups in Malta (defined as having a large member count).

Once a business page is set up on Facebook the user is directed to the Meta Ads Manager software, where an advertisement campaign can be purchased. The user (page



owner) can then identify the characteristics of the target population, the timing of the advertisement and the duration of the campaign.

As part of the Ad Centre Software, there is the option to issue a report with the breakdown of the engagement of Facebook users with the advertisement throughout the purchased campaign (Table 6).

Table 6: Facebook Advertisement Campaign Metrics Report.

<b>Ad Centre Report</b>	
Reach	4, 950
Impressions	13, 271
Frequency	2.68
Link Clicks	127

Reach is defined as the number of Facebook accounts (which equate to profiles) who saw the paid advertisement at least one time. Impressions represent the number of times that the advert was on-screen. The average number of times that each Facebook account saw the advertisement is indicated by the frequency. Link clicks equate to the number of clicks on links within the advertisement, in this case to the Microsoft Forms containing the questionnaire. Link clicks do not necessarily equate to completed questionnaires, but merely a transfer from Facebook to the introductory page of the Microsoft Form.

Of note, these metrics are obtained through statistical sampling and modelling, rather than direct counts. However, they allow a general idea of the overall success (or otherwise) of the advertisement campaign. The data collection also included dissemination through Facebook groups, which did not have similar engagement measurements available. The above values are therefore solely representative of the paid advertisement aspect of data collection.

#### 4.2.2 Survey Response Features

The online survey was provided in both the Maltese and English language. The English language was preferred, and there was a higher proportion of invalid responses in the Maltese option. Invalid responses are those individuals who clicked on the survey link and proceeded to fill in the online survey despite never having used dating apps.

Table 7: Tabular Representation of responses by language.

<b>Language</b>	<b>Invalid Responses</b>	<b>Total Valid Responses</b>	<b>%Valid Response Rate (of Total)</b>
<b>Maltese</b>	6	11	9.16%
<b>English</b>	19	84	70%
<b>Total</b>	<b>25</b>	<b>95</b>	<b>79.16%</b>

No significant association was found between language choice and age, gender and educational attainment.

#### 4.2.3 User Characteristics

The most popular age range was between 25-34 years ( $n = 45$ , 47.4%), as was the female gender ( $n = 57$ ; 60%). The vast majority of respondents were of a heterosexual orientation ( $n = 82$ , 86.3%), and of an educational attainment of at least a tertiary level ( $n = 90$ , 94.7%). Native Maltese responders equated to approximately 80% of the total replies ( $n = 78$ , 82.1%), analogous to the NSO 2021 census which suggests that approximately 1 in 5 individuals are non-Maltese (NSO, 2023a).

An approximately equal number of individuals are single and not actively dating ( $n = 31$ ; 32.6%), dating casually ( $n = 30$ ; 31.6%) and in an exclusive relationship ( $n = 31$ ; 32.6%). The greater part of the respondents ( $n = 56$ ; 59.0%) had formal

sexualities and relationships education; followed by an equal number of individuals who had informal and no educative opportunities. A summary of the findings can be found in the following Table (Table 8).

Table 8: Sociodemographic Characteristics of Responses.

	<b>Frequency (n)</b>	<b>% Total Respondents</b>	<b>p-value</b>
<b>Gender (n = 95)</b>			-
<i>Male</i>	37	39.0%	
<i>Female</i>	57	60.0%	
<b>Age Range (n = 95)</b>			0.078
<i>18-24 years</i>	13	13.7%	
<i>25-34 years</i>	45	47.4%	
<i>35-44 years</i>	22	23.2%	
<i>45-49 years</i>	3	3.2%	
<i>50+</i>	12	12.6%	
<b>Sexual Orientation (n = 95)</b>			0.980
<i>Heterosexual</i>	82	86.3%	
<i>Homosexual</i>	6	6.3%	
<i>Bisexual</i>	7	7.4%	
<b>Educational Attainment (n = 95)</b>			0.958
<i>Primary</i>	0	0	
<i>Secondary</i>	5	5.3%	
<i>Tertiary</i>	40	42.1%	
<i>Post-Graduate</i>	50	52.63%	
<b>Country of Birth (n = 95)</b>			0.789
<i>Malta</i>	78	82.1%	
<i>Other</i>	17	17.9%	
<b>Relationship Status (n = 95)</b>			0.747
<i>Exclusive Relationship</i>	31	32.6%	
<i>Casual Dating</i>	30	31.6%	
<i>Open Relationship</i>	1	1.1%	
<i>Single and Not Dating</i>	31	32.6%	
<i>Unspecified</i>	2	2.1%	
<b>Sexualities and Relationships Education (n = 95)</b>			0.009*
<i>Formal</i>	56	59.0%	
<i>Informal</i>	19	20.0%	
<i>None</i>	18	19.0%	
<i>Both Formal and Informal</i>	2	2.1%	

\*Fisher's Exact Test.

Upon carrying out univariate analysis on sociodemographic variables by gender, a significant association was found between the presence of sexualities and relationships education and gender ( $p = 0.009$ ). No other significant associations were found between the other sociodemographic variables and gender.

Univariate analysis by age suggested a statistically significant relationship to educational attainment ( $p = 0.008$ ), sexualities and relationships education ( $p = 0.014$ ). Associations between age and the other sociodemographic variables collected were due to chance. No statistically significant associations were found when analyzing by educational attainment.

#### 4.2.3.1 Age Considerations

The age ranges specified in Table 8 were further modified prior to analysis to be able to improve statistical analysis. Ages 35-49 years were grouped together to represent the proportion of dating app users who are seeking digital contact after milestone delay or dissolution of long-term relationships. Respondents aged 50 and above were grouped together to avoid potential identifiability concerns. Ages 18-24 and 25-34 years were kept separate as these represent the most popular cohort which utilizes dating apps.

#### 4.2.3.2 Gender Factors

One respondent selected 'Other' gender. Despite being an area of growing interest and importance on a sociocultural and health level, this respondent was excluded from the analysis as no meaningful findings would be obtained from one individual.

### 4.2.3.3 Countries of Birth

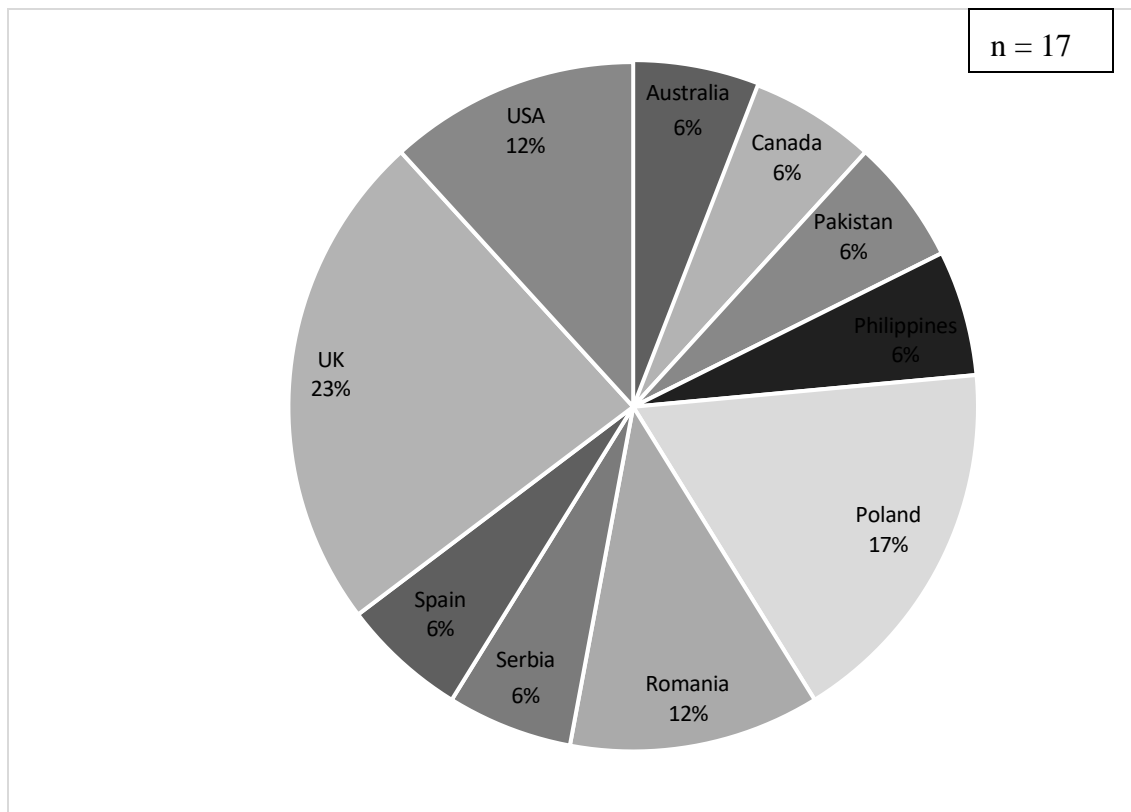


Figure 2: Individual foreign countries of birth (as % total non-Maltese countries of birth).

There have been many sociodemographic changes in the recent years in the Maltese islands, one of which is the exponential increase in the foreign population (NSO, 2023a). In order not to induce bias, the proportion of non-Maltese individuals was not specifically targeted so as not to induce element of bias. However, approximately 20 percent of respondents were foreign, analogous to the latest census results (Figure 2).

For the purpose of effective data analysis, the non-Maltese countries were grouped together as indicated in Table 8 to maximize the significance of the results obtained.

#### 4.2.3.4 Sexual Orientation

Analogous to the rationale behind joining non-Maltese countries to maximize statistical power, a similar procedure was effected with respect to sexual orientation. The homosexual (n = 6; 6.3%) and bisexual orientations (n = 7; 7.4%) were collated together for further analysis. This allows for the improvement of statistical power whilst being faithful to the the original research aim and objectives, wherein the general experiences of the Maltese resident population, rather than specific sexual minority experiences are the major scope of the study. However, this compilation may lead to the potential obfuscation of the respondents' distinct sexual identities and experiences, which may differ between orientations. This can be mitigated by future focused research on sexual minorities with appropriate representation of the different sexual minorities.

#### 4.2.4 Usage Patterns

The following section shall consider the analysis of parameters related to usage patterns of Maltese dating app users in Malta including identification of popular dating apps, frequency of multiple GNDA use; duration of use, type of offline encounters and means of introduction to GNDA's.

##### 4.2.4.1 Popularity and Types of Dating Apps Used

The most popular dating apps overall were Tinder (n = 82; 86.3%), Bumble (n = 42; 44.2%); Badoo (n = 22; 23.2%); Facebook Dating (n = 19; 20.0%); OkCupid (n = 7; 7.4%) and Grindr (n = 5; 5.3%). A variety of dating apps were mentioned (Table 9). Interestingly there were a number of niche dating apps which were indicated, including 40+ dating sites whose targets are mature adults and Feeld which caters for over 20 sexuality and gender options. Other GNDA's mentioned

include Her which is targeted for LGBTIQ+ women and TanTan, which caters for individuals who would like to connect with Asians.

Table 9: Tabular Representation denoting Dating app frequency of use by respondents

Dating App	Frequency (n)	%Total
<b>Tinder</b>	82	86.3
<b>Bumble</b>	42	44.2
<b>Badoo</b>	22	23.2
<b>Facebook Dating</b>	19	20.0
<b>OkCupid</b>	7	7.4
<b>Grindr</b>	5	5.3
<b>Scruff</b>	2	2.1
<b>Dinky One</b>	2	2.1
<b>Boo</b>	2	2.1
<b>Connecting Singles</b>	2	2.1
<b>Romeo</b>	1	1.1
<b>Hinge</b>	1	1.1
<b>Happn</b>	1	1.1
<b>Hornet</b>	1	1.1
<b>TanTan</b>	1	1.1
<b>Feeld</b>	1	1.1
<b>Her</b>	1	1.1
<b>40+ Dating Site</b>	1	1.1
<b>Dating.com</b>	1	1.1
<b>eHarmony</b>	1	86.3

However, there were significant associations between the male gender and the Grindr GNDA ( $p = 0.008$ ), in that it is a dating app targeting GBMSM. Despite having multiple other similar dating apps with the same target population (Scruff, Romeo ( $p = 0.063$ ), Hornet) no other significant associations were found. There was also a significant difference between sexual orientation and use of Facebook dating ( $p < 0.038$ ), Grindr ( $p = 0.001$ ), Scruff ( $p = 0.017$ ). In the former case, a heterosexual orientation predicted the use of Facebook dating, whereas being homosexual or bisexual predicted the use of Grindr and Scruff. There were no other significant associations between sexual orientation and individual dating apps. Many dating app users were found to have used multiple apps, with an average of 2.05. Most individuals only used one dating

app in the previous 12 months (Refer to Figure 3).

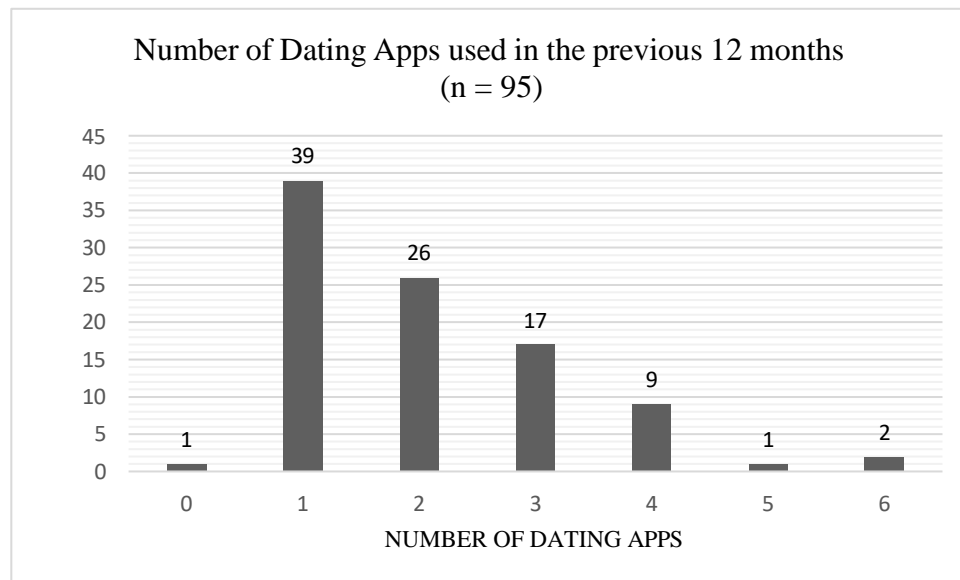


Figure 3: Graphical representation of frequency versus number of dating apps used in previous 12 months.

Significant associations were found between age and the use of Tinder ( $p = 0.022$ ), particularly the 25-34 age group and connecting Singles ( $p = 0.015$ ) in the 50+ age group. Relationship status was found to have a statistically significant relationship to Bumble use ( $p = 0.012$ ) and Facebook Dating ( $p = 0.038$ ) in individuals who are dating casually and are single and not dating, and Dating.com ( $p = 0.032$ ) in individuals with unspecified relationship statuses. In terms of educational attainment, there was a significant association between tertiary education or higher to Badoo ( $p = 0.031$ ) and secondary level education and Connecting Singles ( $p = 0.002$ ) use.

Being born outside of Malta was only associated to the use of Dinky One ( $p = 0.03$ ). No other significant associations were found between specific GNDAs and age, relationship status, educational attainment and country of birth. Sexualities and relationships education was not found to have a statistically significant association to any of the GNDAs listed by the respondents.



No statistically significant associations were found between usage of individual apps, discovery method and frequency of use.

#### 4.2.4.2 Method of Discovery of GNDAs

Method of dating app discovery was also assessed. The most popular were word of mouth (n = 69; 72.6%) and social media (n = 54; 56.8%). (Refer to Figure 4).

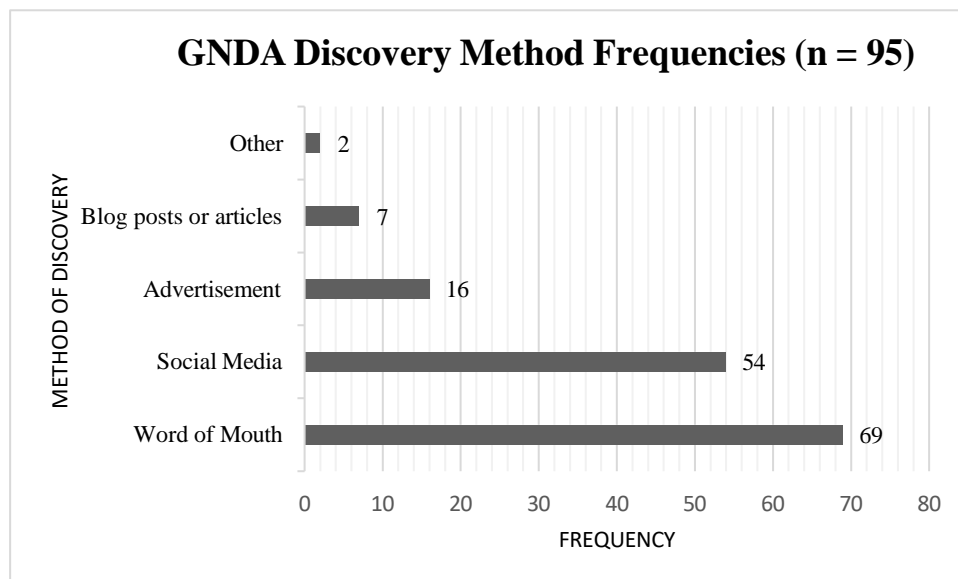


Figure 4: Graphical representation of dating app discovery method versus frequency.

Statistically significant associations were found between an LGBTIQ+ sexual orientation and other sources ( $p = 0.017$ ). This also found to have a significant relationship to relationship status ( $p = 0.021$ ), particularly being in an open relationship and single and not dating. No other significant associations were found between sociodemographic characteristics and discovery methods.

#### 4.2.4.3 Frequency of Dating App Use

Most of the respondents use dating apps a few times per week (n = 26; 27.4%) and between 1-4 times a day (n = 24; 25.2%). The option 'Not Anymore' was added

for those individuals who indicated they had used dating apps in the past, but not in the previous 12 months. Refer to Figure 5 for full results.

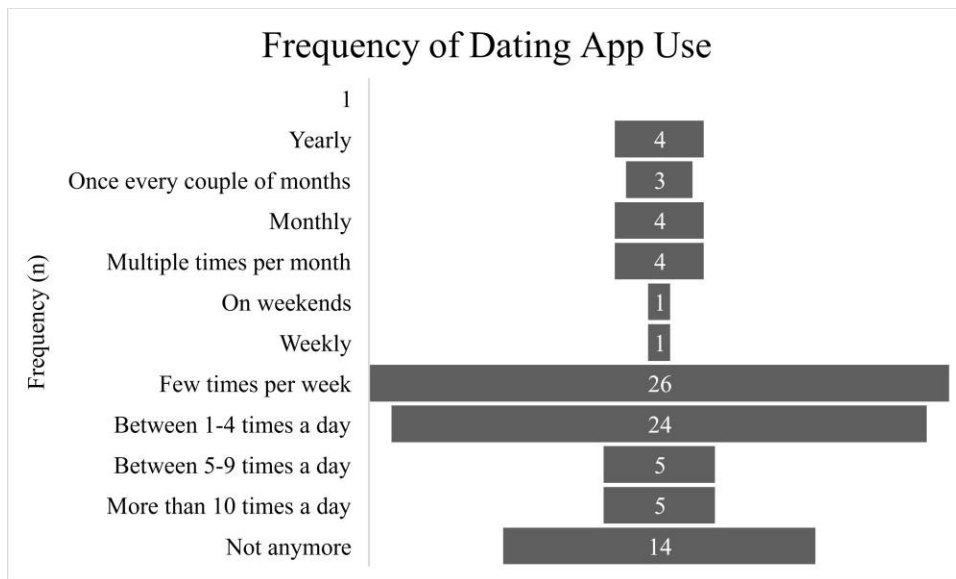


Figure 5: Graphical representation of frequency of dating app use in respondents (n = 95).

No significant association was found between frequency of dating app use and the pre-defined sociodemographic characteristics.

#### 4.2.4.4 Types and Frequency of Offline Encounters

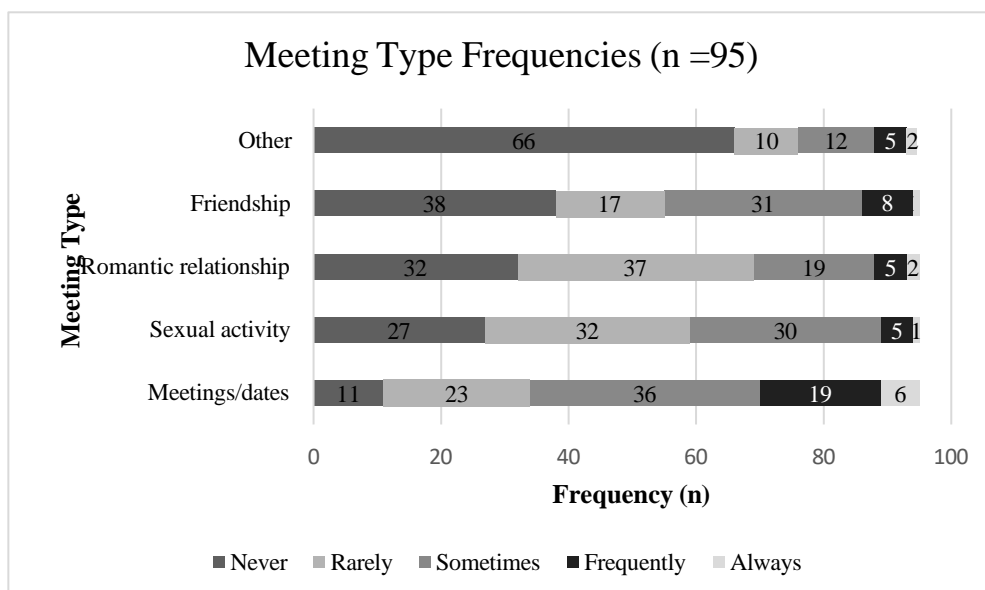


Figure 6: Graphical representation of frequency and type of offline encounters in sample population.

With respect to types of offline encounters, a significant association has been found between having offline encounters aimed at forming a romantic relationship and formal sexualities and relationships education ( $p = 0.038$ ). No other statistically significant associations were found between the various types of offline encounters and gender, age, sexual orientation, relationship status, educational attainment and country of birth.

#### 4.2.5 Motivations

There is a statistically significant relationship between the motivation of seeking a relationship ( $p = 0.041$ ), curiosity ( $p = 0.038$ ) and educational attainment, particularly at tertiary and post-graduate levels. There also appears to be a strong link between sexual experiences ( $p < 0.001$ ) and gender, with females tending to disagree that this variable is an important motivator of dating app use.

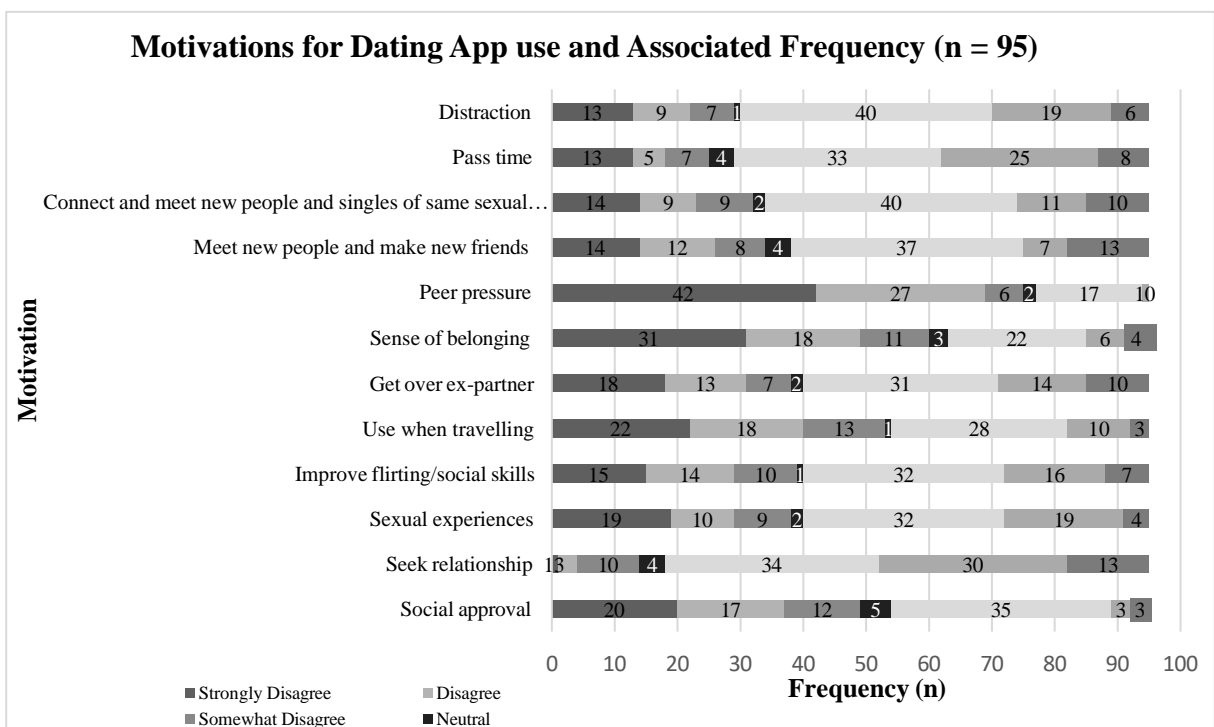


Figure 7: Graphical representation summarizing motivations for GNDA use against frequency in respondents

#### 4.2.6 Perceived Risks and Benefits

A statistically significant association was found between comparing oneself to other users and the male gender ( $p = 0.018$ ) who tend to opt for the 'Neutral' option. Similar associations were found between GNDAs use being a positive experience overall and relationship status ( $p = 0.043$ ), particularly the exclusive relationship, casual dating and single and not dating categories who tend to opt for either the 'Disagree' or 'Neutral' options. Sexual orientation was also significantly linked to sexual orientation as the motivation of using GNDAs for development of new sexual skills ( $p = 0.026$ ). This was in turn found to be associated with a heterosexual orientation who tend to 'Strongly Disagree' or 'Disagree'.

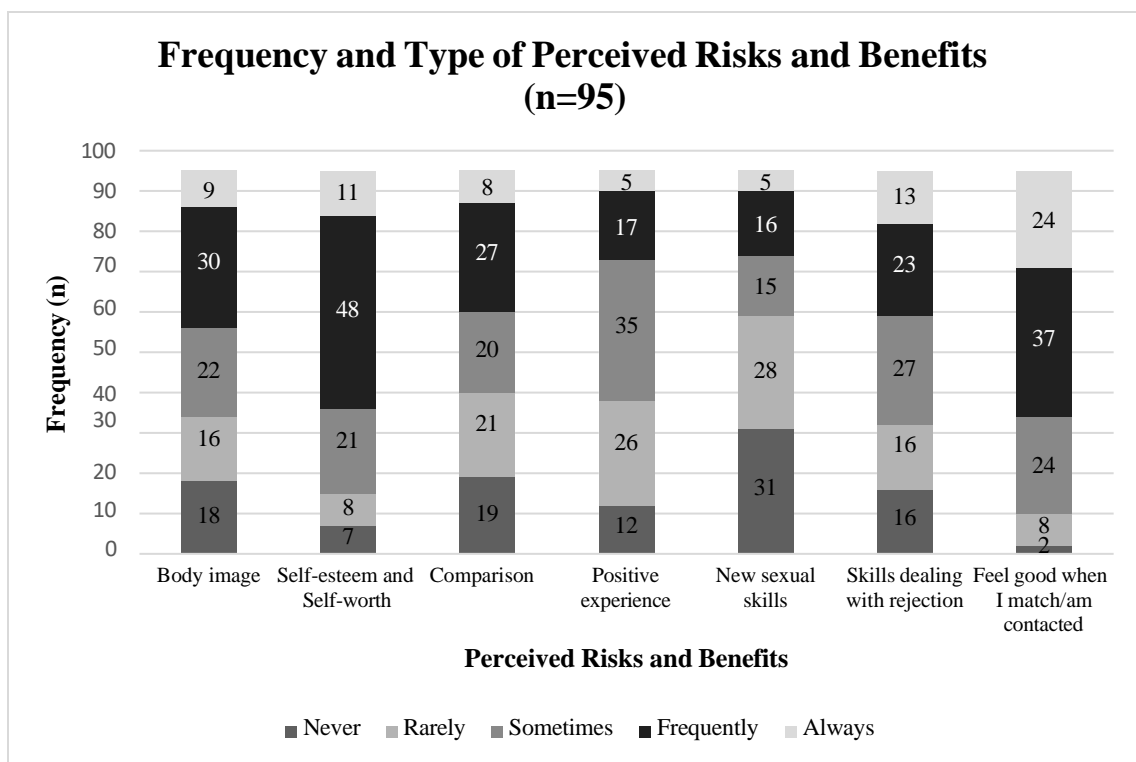


Figure 8: Graphical representation denoting the frequency and type of respondents' perceived risks and benefit.

A further assessment of perceived risks and benefits looking at further aspects of dating apps is summarized in Figure 9 below.

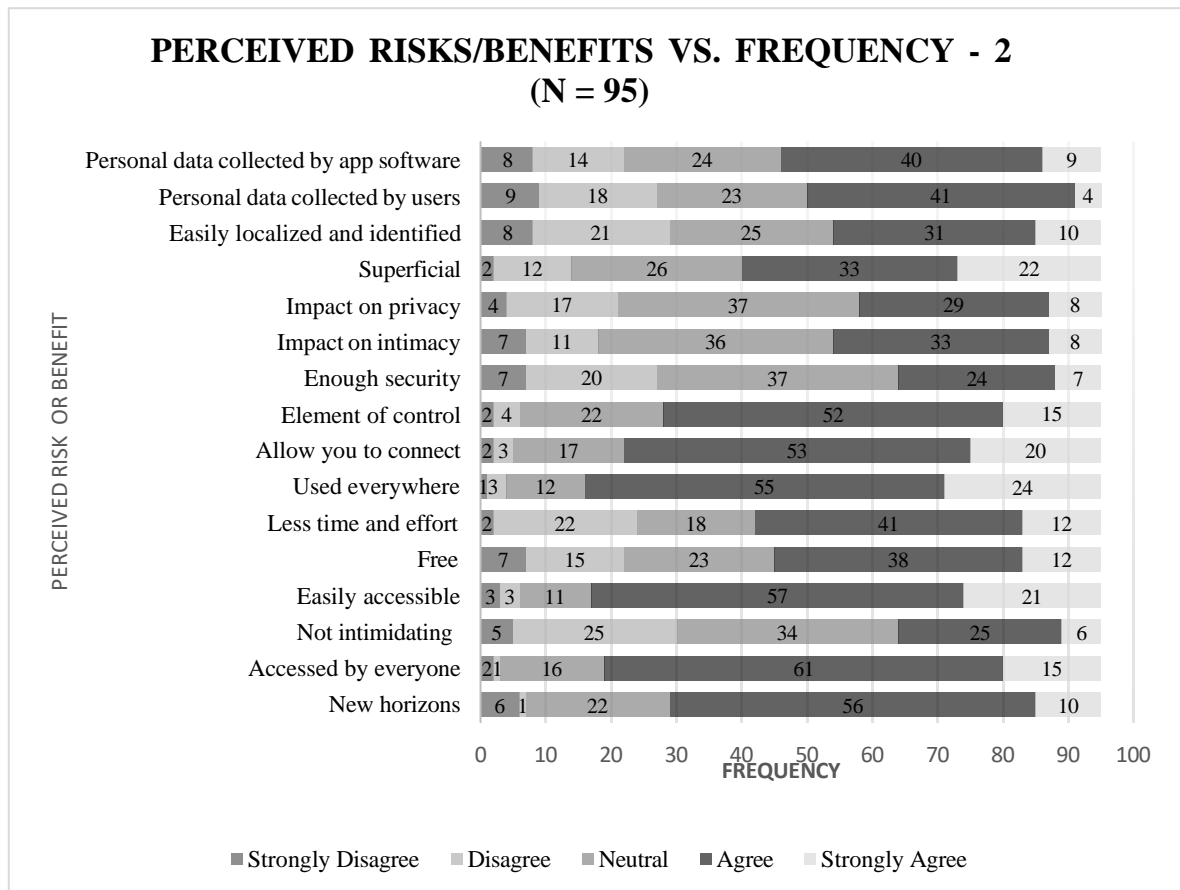


Figure 9: Graphical representation denoting additional perceived risks and benefits and associated frequency.

There is a statistically significant association between the perception that GNDAs offer new horizons and gender ( $p = 0.018$ ), with females having the tendency to feel 'Neutral' or 'Agree'. Gender was also significantly associated with the perception that dating apps are not intimidating ( $p = 0.031$ ), that they are free ( $p = 0.001$ ) and that GNDAs allow you to connect with individuals who are geographically close ( $p = 0.031$ ). Sexualities and relationships education was in turn significantly associated with the perception that dating apps are equipped with the

necessary security measures to protect their customers ( $p = 0.028$ ), that dating apps have an impact on intimacy ( $p = 0.01$ ) and privacy ( $p = 0.022$ ).

Females were more likely to feel 'Neutral' about the perception that dating apps are intimidating and 'Agree' with the perception that they are free and that GNDAs allow you to connect with other individuals who are geographically close. Individuals that had formal sexualities and relationships education were more likely to feel 'Neutral' about GNDA security measures, and 'Agree' that GNDAs have an impact on intimacy and privacy.

A statistically significant association was also found between relationship status and the perception that GNDAs allow an element of control with whom one communicates ( $p = 0.025$ ). This was particularly true for individuals in an exclusive relationship and those who were single and not dating who tended to agree with this perception.

Educational attainment was found to have a statistically significant relationship with the perception that dating apps have an impact on intimacy ( $p = 0.042$ ) and that GNDAs are superficial ( $p = 0.034$ ). Individuals with a tertiary level of educational attainment agreed with this perception. This variable was also found to have a statistically significant relationship to country of birth ( $p = 0.039$ ). Being born in Malta predisposed beliefs on neutrality on this perceived risk.

The concern that dating app users can be easily identified and localized has been significantly linked to sexual orientation ( $p = 0.012$ ) and that personal data is collected by users ( $p = 0.026$ ). Heterosexual individuals tended to agree with these statements.

## 4.2.7 Sexual Behaviours

### 4.2.7.1 Knowledge of SAIs and Associated Services

The knowledge of SAIs has been assessed by looking at the frequency of individuals who are aware of the various SAIs. The most widely known SAIs were HIV/AIDS (n = 92; 96.8%), gonorrhoea (n = 86; 90.5%), syphilis (n = 83; 87.4%) and chlamydia (n = 82; 86.3%). Conversely, the least widely known SAIs were pinworms (n = 1; 1.1%), Human T-cell lymphocytic virus type 1 (HTLV) (n = 11; 11.6%) and lymphogranuloma venereum (n = 15; 15.8%). The full results can be viewed in Figure 11 below.

Table 10: Table showcasing significant results obtained when testing SAI knowledge with age.

SAI	p-value*
Chlamydia	0.002
Gonorrhoea	0.039
Humanpapilloma virus (HPV)	0.001
Mpox	0.047
Pubic lice	0.001
Lymphogranuloma venereum	0.049
Chancroid	0.009
Granuloma genitalium	0.047
Mycoplasma genitalium	0.002

\*Fisher's Exact Test

Age was associated with statistically significant awareness of multiple SAIs, summarized in Table 10. Being in the age-group between 24-35 was the significant predictor to this knowledge.

Casual dating (p = 0.003) and formal relationships and sexualities education (p = 0.001) were found to significantly determine awareness of the existence of trichomoniasis. Being in an exclusive relationship was associated with awareness of Zika virus (p = 0.002). Formal sexual health education was also associated with knowledge of lymphogranuloma venereum (p = 0.019), mycoplasma genitalium

( $p < 0.001$ ), HTLV ( $p = 0.027$ ) and granuloma genitalium ( $p = 0.002$ ). The latter two variables were also associated with informal sexual health education.

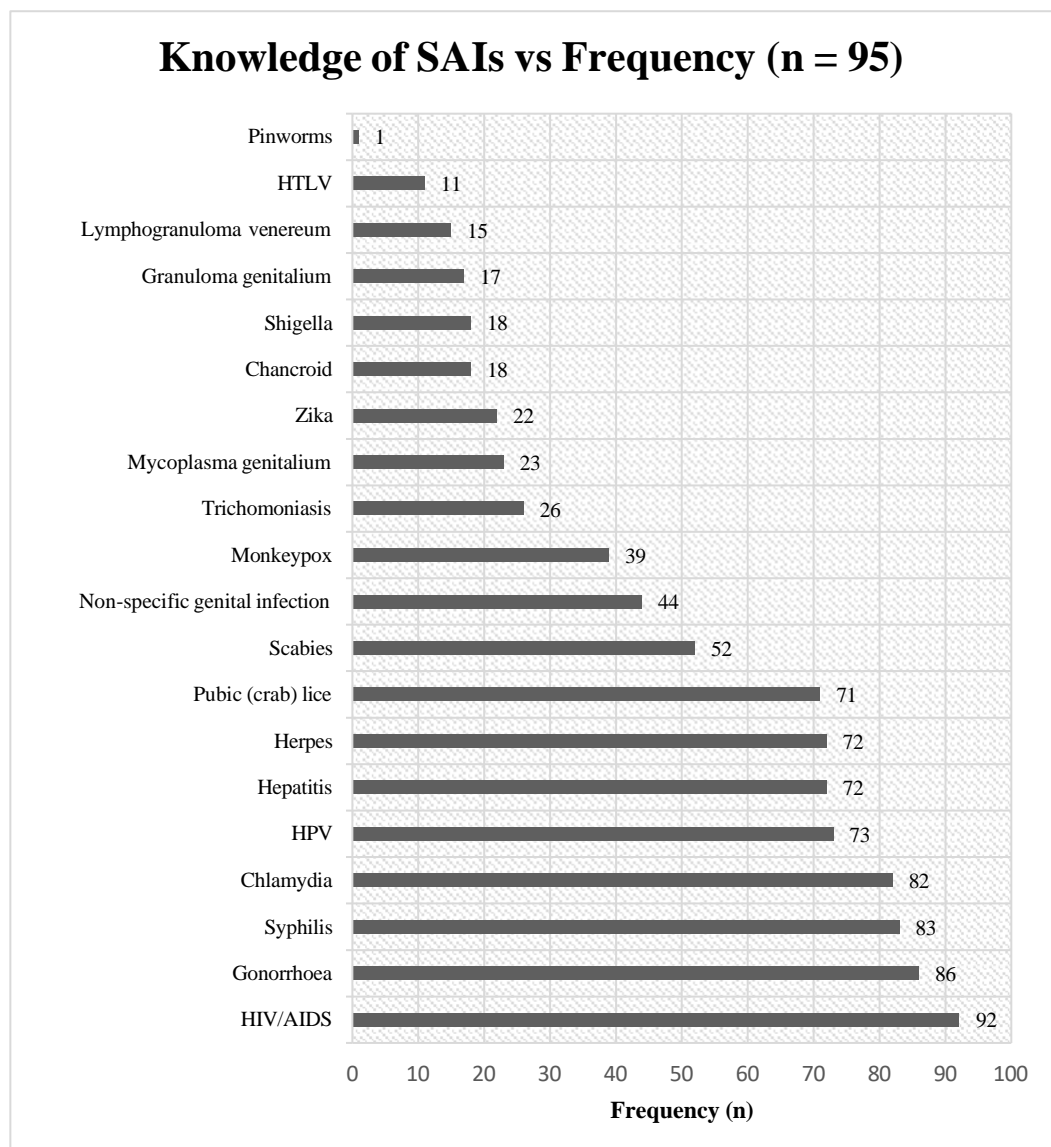


Figure 10: Graphical representation denoting frequency of knowledge of sexually acquired infections.

Another element which assessed sexual health knowledge was the awareness of Malta-based sexual health services. The most widely known services are the GU clinic (n = 75; 78.9%), breast screening (n = 68; 71.6%), Richmond Foundation, cervical screening, and Caritas (n = 57; 60.0%). The least known sexual health services are women and men's health physiotherapy (n = 9; 9.47%); Care for Victims of Sexual



Assault (CVSA) (n = 15; 15.79%), maternal medical health and Servizz Ghozza (n = 16; 16.8%). Refer to Figure 11 for full results.

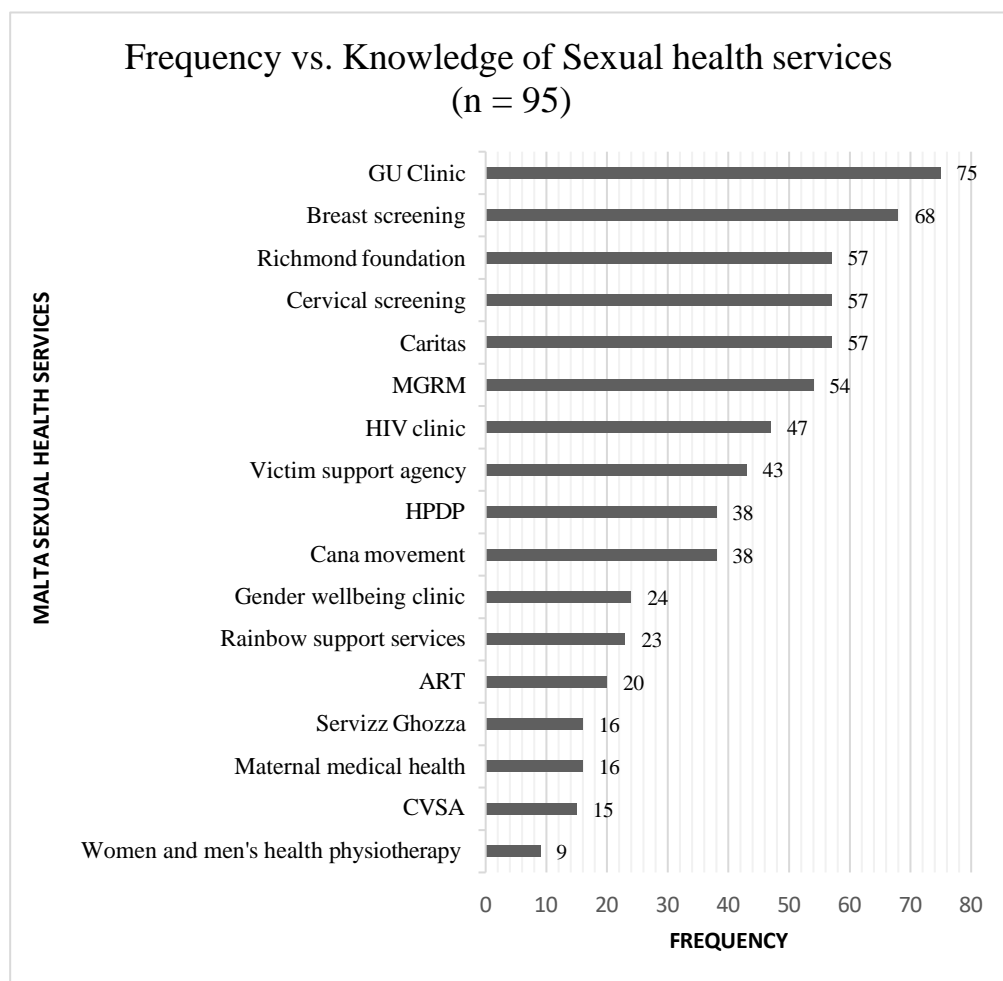


Figure 11: Graphical representation denoting frequency of knowledge of Malta-based sexual health services.

Table 11: Significant results between knowledge of Malta-based sexual health services and sociodemographic characteristics.

<b>Sociodemographic Variable</b>	<b>Sexual Health Service</b>	<b>p-value*</b>
<b>Country of Birth</b>	GU Clinic	0.007
	Caritas	0.006
	Gender wellbeing	0.005
	Richmond Foundation	0.029
	Canva Movement	0.012
<b>Relationship Status</b>	Assisted Reproductive Technology (ART)	0.001
	Breast screening	0.019
	Gender wellbeing clinic	0.045
<b>Gender</b>	Breast screening	<0.001
	Cervical screening	0.002
<b>Sexual Orientation</b>	Richmond Foundation	<0.001
	Caritas	0.03
	Gender wellbeing clinic	0.003
<b>Educational Attainment</b>	Maternal medical health	0.028
	CVSA	0.028

\*Fisher's exact test.

Statistically significant associations between sociodemographic characteristics and sexual health services in Malta is summarized in Table 11. Being born in Malta was the most significant predictor of awareness of the above-indicated Malta-based sexual health services.

Being in an exclusive relationship was significantly linked to knowledge of ART, gender wellbeing clinic and breast screening. The latter was also associated significantly with casual dating. Heterosexual orientation was significantly linked to knowledge of gender wellbeing clinic.

#### 4.2.7.2 Sexual Behaviours

A sexual health metric is the presence of multiple sexual partners. Of the respondents, 67.4% (n = 64) had had sexual relations in the previous 12 months prior to answering questionnaire; 32.6% (n = 31) had not.

Of the 95 respondents, 32.6% (n = 31) had no sexual relations. Most of the 64

individuals who indicated they had sexual intercourse in the previous 12 months prior to completion of questionnaire had 1 sexual partner (n = 39; 41.1%), followed by 2-5 sexual partners (n = 19; 20.0%). Refer to Figure 12 for complete details.

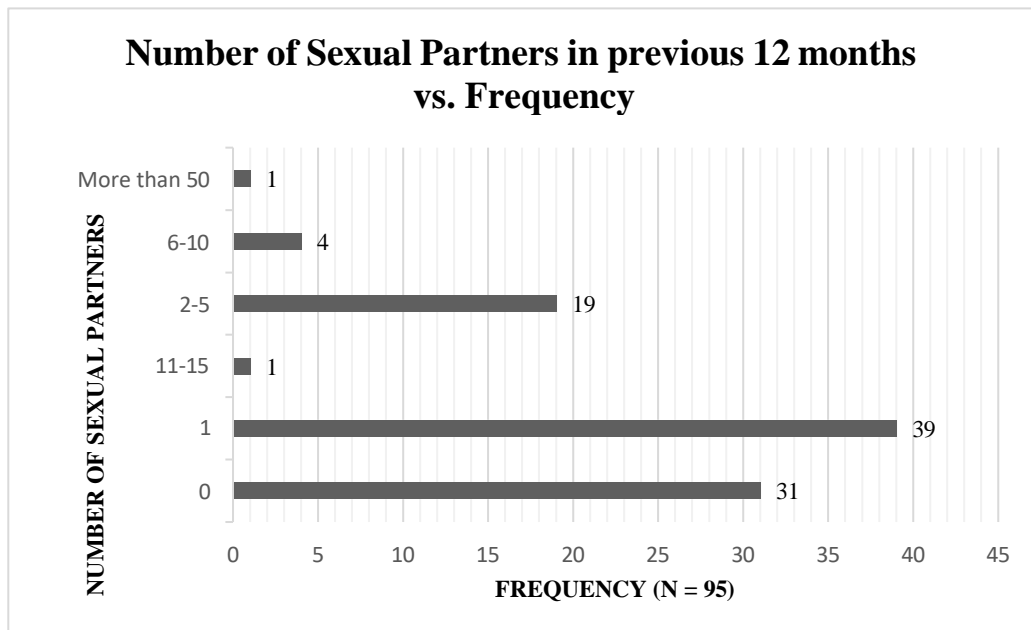


Figure 12: Graphical representation denoting frequency of number of sexual partners in previous 12 months.

There is a statistically significant association between having sexual relations in the previous 12 months ( $p < 0.001$ ) and being in an exclusive relationship. Number of sexual partners ( $p < 0.001$ ) in the previous 12m prior to questionnaire completion also gave significant results. Having no sexual partners was associated with a single and not dating status and having 2-5 sexual partners was associated with casual dating. No other significant associations were found comparing sexual intercourse in the previous 12 months with the pre-defined sociodemographic characteristics were identified.

Significance testing between an engagement in risky sexual behaviours in the 12 months prior to completion of questionnaire and sociodemographic characteristics are as follows:

Table 12: Significance testing between engagement in risky sexual behaviours and sociodemographic characteristics.

<b>Sociodemographic Characteristic</b>	<b>Sex Behaviour (Y/N)</b>	<b>p-value*</b>
Relationship status	Casual sex	0.002
	Multiple sexual partners	0.004
	Sexual relations without contraception	<0.001
	Sex without condom but with other forms of contraception	0.045
<b>Age</b>	Sexual relations while drunk	0.008
Sexual Orientation	Multiple sexual partners	0.004
Relationships and sexualities education	Sex without contraception	0.041
Gender	Sex without condom but with other forms of contraception	0.027

\*Fisher's exact test.

Casual dating has been significantly associated with having casual sex. Being in an exclusive relationship and being single and not actively dating was in turn associated with lack of multiple partners. The former was also significantly associated with the practice of having sex without a condom but with other forms of contraception.

Individuals aged between 25-34 have been found to have significant associations with having sexual relations while drunk. Being heterosexual has been significantly linked to having no multiple partners. Sex without contraception has been associated with having formal sexualities and relationships education. The male gender is associated with having sex without a condom but with other forms of contraception. Perceptions of the same risky sexual behaviours were also correlated to sociodemographic characteristics. Significant associations have been summarized in Table 13 following:

Table 13: Significance testing showcasing relationships between perceptions of risky sexual behaviours and sociodemographic characteristics.

<b>Sociodemographic Characteristic</b>	<b>Perceptions of Risky Sexual Behaviours</b>	<b>p-value*</b>
Gender	Casual sex	0.004
	Sex while drunk	0.011
	Multiple sexual partners	0.005
	Sex without contraception	0.005
Educational attainment	Sex without contraception	0.027
Country of birth	Discussion of SAI status and boundaries	0.004

\*Fisher's exact test.

The female gender has been associated with perceptions that casual sex, sex while drunk, multiple sexual partners and sex without contraception is very high risk. A post-graduate level of educational attainment is associated with the risk perceptions that sex without contraception is very high. Being born in Malta has been associated with low perception risk of discussion of SAI status and boundaries.

The frequency of not using contraception on a regular basis ( $p = 0.025$ ) and the use of other contraceptive methods (not listed in question and suggested by respondents, grouped together to add power) ( $p = 0.045$ ) has been found to be associated with sexual orientation. No other statistically significant associations with user characteristics were found. The 'Other' options included bilateral salpingectomies, "no vaginal penetration" and abstinence.

Only 3.2 percent of respondents used PrEP/PEP regularly ( $n = 3$ ). No associations were found between orientation, sexualities and relationships education, educational attainment, relationship status and age.

Frequency of the responses pertaining to considerations after sexual intercourse are summarized in Figure 18. Correlations to sociodemographic characteristics and associated significant links are as follows (Table 14):

Table 14: Significance testing indicating relationships between considerations post-sexual encounter and sociodemographic characteristics.

Sociodemographic Characteristic	Considerations post-sexual encounter	p-value*
Relationship status	Pregnancy	0.025
Age	Pregnancy	<0.001
	Low/infertility	<0.001
Gender	Cancer	0.032
	Local soreness or pain	0.029
	Urinary tract infections	0.006
	Emotional considerations	0.008
Educational attainment	HIV/AIDS	0.025
Country of birth	Other physical issues	0.018

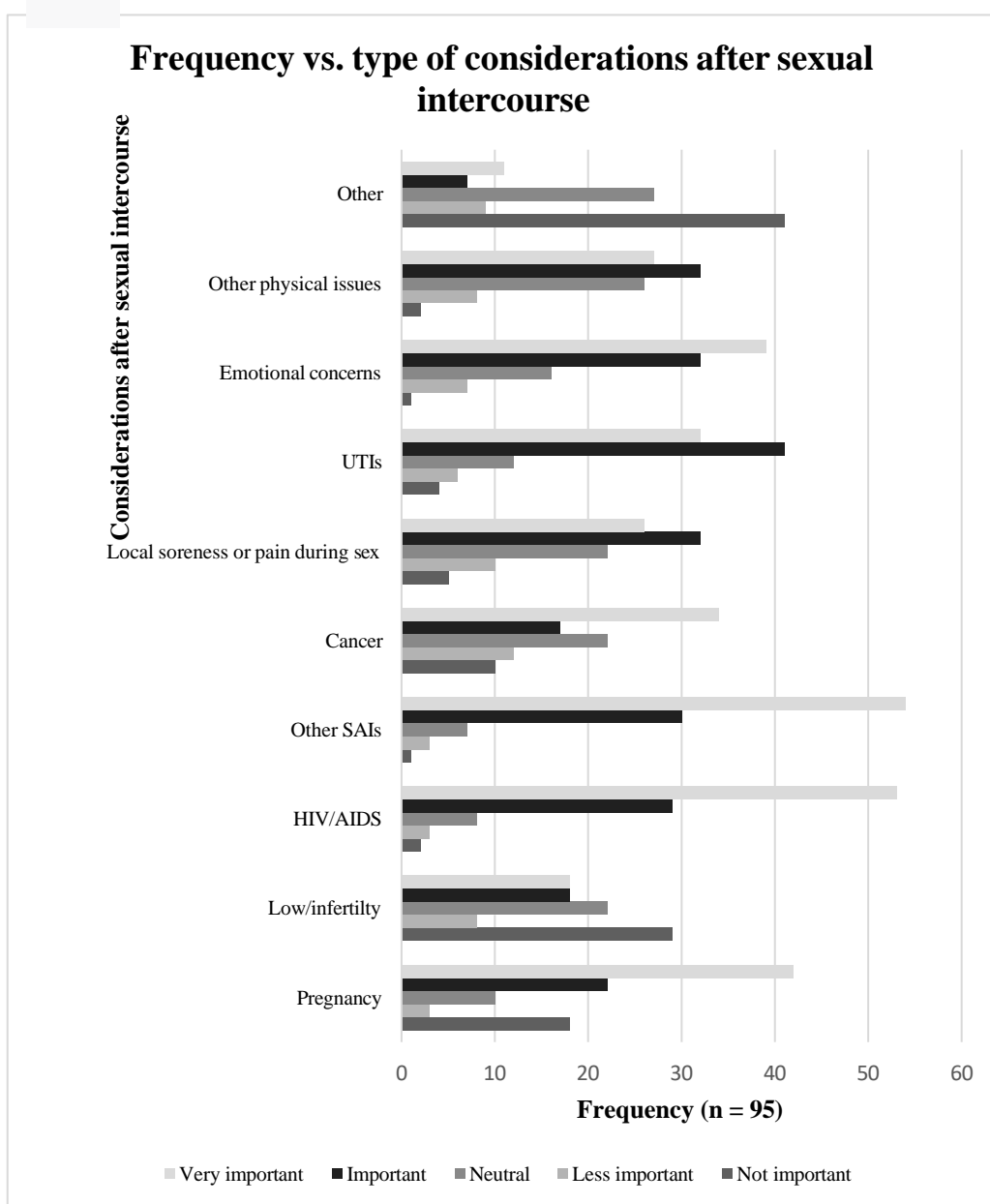


Figure 13: Graphical representation denoting frequency of types of considerations following sexual encounters.

Pregnancy is considered to be 'Very Important' on the list of considerations post-sexual encounter in individuals in an exclusive relationship and those who are single and not actively dating. It was also found to be very important in the 25-34 age group. The female gender was also significantly associated with considering cancer and emotional considerations as being 'Very Important', local soreness or pain and urinary tract infections as being 'Important' or 'Very Important'. A tertiary level of educational attainment was statistically linked with considering HIV/AIDS as being 'Very Important'. Being born in Malta has also been associated with considering physical issues related to body image and self-esteem as being 'Not Important' or 'Neutral'.

#### 4.2.8 User Recommendations

Respondents were also asked whether they had any recommendations on how dating apps could be safer from a sexual health perspective. Thirteen recommendations were received (13.7%). Themes that emerged included having health promotion campaigns in the form of banners or advertisements (timed or unskippable), termed as 'reminders' by one of the respondents. Themes mentioned include protection against SAIs, contraceptives and identification of protective behaviours.

The standardization and availability of reputable sexual health information sources on GNDA interfaces was also mentioned. Multiple individuals also listed the importance of regular testing and defining health status on GNDA.

General comments on the importance of health promotion campaigns targeted at the general population were also made, particularly for those who are seeking new partners for casual or long-term connections on the importance of regular testing.

The following section shall focus on the associations identified between the

different outcomes.

## 4.2.9 Links to Usage Patterns

### 4.2.9.1 Usage Patterns and Motivations

Table 15: Tabular representation summarizing the significant relationships between different dating apps and motivations behind their use.

Usage Pattern	Motivation	p-value*
<b>Dating app:</b>		
Facebook dating	Sense of belonging	0.012
Grindr	Sexual experiences	0.034
Scruff	Sexual experiences	0.002
Badoo	Seeking a relationship	0.003
	Use while travelling	0.035
	Peer pressure	0.038
Dinky One	Sexual experiences	0.028
	Improve flirting/social skills	0.036
	Get over ex-partner	0.013
	Meet new people/make new friends	0.019
	Connect and meet new people and singles of the same sexual orientation	0.040
	Pass time	0.013
	Distraction	0.020
	Curiosity	0.005
Boo	Meet new people/make new friends	0.006
Connecting singles	Distraction	0.028
Feeld	Use when travelling	0.042
eHarmony	Sexual Experiences	0.021
	Improve flirting/social skills	0.011
	Get over ex-partner	0.021
	Sense of belonging	0.032
	Peer pressure	0.032
	Meet new people and make new friends	0.042
	Connect and meet new people and singles of the same sexual orientation	0.021
	Pass time	0.042
	Distraction	0.011
	Curiosity	0.021



	Sense of belonging	
--	--------------------	--

\*Fisher's Exact Test.

The statistically significant relationships between individual dating apps and motivations of use are summarized in Table 15. When considering discovery methods and motives behind dating app use, social media has been found to be significantly associated with connecting and meeting new people and singles of the same sexual orientation ( $p = 0.007$ ), and blog posts associated with the motive of distraction ( $p = 0.075$ ), passing time ( $p = 0.019$ ).

#### 4.2.9.2 Usage Patterns and Perceived Risks and Benefits

Tinder users more likely to have neutral opinions on its use relating to perceptions that using the app is not intimidating. Bumble and OkCupid users are more likely to agree that use of app is linked to comparison of self with other and to the perception that it is free. With respect to intimacy impacts, Bumble users had a more neutral stance. Ok Cupid users agreed that dating apps offer an element of control with whom to communicate.

Users of Facebook Dating more likely to agree that its use is linked to perceived novel manners how to meet new people. On the other hand, Grindr users have been found to agree that its use is linked to new sexual skills and an element of comparison to other users. Scruff users 'Strongly Agree' with the statement with the use of dating apps for development of new sexual skills.

Badoo users tend to have neutral views on the impact of dating apps on intimacy. Agreement on the statement that dating apps can be used anywhere was found in Hinge users. Dinky One users agree that dating apps are easily accessible. Boo users appeared to agree with the concept that dating apps have an impact on

self-esteem and self-worth, comparison to other users.

Significant results with statements related to privacy impact of GNDA use were solely related to Dating.com use, which were neutral in nature. Users of the same app however agreed that personal data may be collected by users. These results are summarized in Table 16 following:

Table 16: Table summarizing significant relationships between use of different GNDA's and perceived risks and benefits.

Usage Pattern	Perceived Risk/Benefit	p-value*
<b>Dating app:</b>		
Tinder	Not intimidating	0.023
Bumble	Comparison to other users	0.030
	Free	0.015
	Impact on intimacy	0.023
Facebook Dating	New horizons	0.028
Grindr	Comparison to other users	0.011
	New sexual skills	0.038
Scruff	New sexual skills	0.002
Badoo	Impact on Intimacy	0.046
OkCupid	Free	0.040
	Element of Control	0.024
Hinge	Used everywhere	0.042
Dinky One	Easily accessible	0.018
Boo	Self-esteem and self-worth	0.023
	Comparison to other users	0.006
Dating.com	Impact on Privacy	0.042
	Personal data collected by users	0.042

\*Fisher's exact test.

#### 4.2.9.3 Usage Patterns and Sexual Behaviour

Individuals whose offline encounters involved sexual activity rarely or

sometimes tend to not know about scabies, HTLV and chancroid. Similarly, users who reported that dating app use sometimes led to the formation of friendship were significantly more likely to not know about trichomoniasis and shigella. Use of the dating app Bumble significantly predicted a lack of awareness of the SAI chlamydia. Similar results were obtained with Scruff and Boo and knowledge of shigella and chancroid respectively.

With respect to sexual health services, use of Grindr significantly predicted knowledge of gender support clinic and rainbow support services. Badoo users were not aware of the presence of CVSA. On the contrary, Connecting Singles users were aware of maternal medical health services. Individuals whose dating app use sometimes led to friendship were not aware of the services offered by CVSA (Refer to Table 17).

Table 17: Table summarizing significant results obtained when relating sexual health knowledge (SAIs, services) with individual dating app use and encounter type.

<b>Sexual Health Variable</b>	<b>Usage Pattern Variable</b>	<b>p-value*</b>
<b>SAI:</b>	<b>Dating App:</b>	
Chlamydia	Bumble	0.034
Shigella	Scruff	0.034
Chancroid	Boo	0.034
	<b>Offline encounter type:</b>	
Scabies	Sexual activity	0.037
Chancroid		0.015
HTLV		0.043
Trichomoniasis	Friendship	0.035
Shigella		0.044
<b>Sexual Health Service:</b>	<b>Dating App:</b>	
Gender wellbeing clinic	Grindr	0.014
Rainbow support services		0.012
CVSA	Badoo	0.028

Maternal Medical Health	Connecting Singles	0.027
	<b>Offline Encounter Type:</b>	
CVSA	Friendship	0.031

\*Fisher's Exact test

Using dating apps a few times per week (n = 22) was associated with unawareness of the existence of mpox, HTLV and shigella. No other significant associations were found between frequency of use and other SAIs, as well as between the former and knowledge of Malta-based sexual health services.

The following table (Table 18) summarizes significant findings between usage patterns and practices and perceptions of risk of certain sexual behaviours, contraception use and considerations after sexual encounters.

Table 18: Table summarizing significant results obtained when different dating apps to aspects of risky sexual behaviours.

Sexual Health Variable	Usage Pattern Variable	p-value*
<b>Risky Sexual Behaviour (Practice):</b>	<b>Dating App:</b>	
Sex with previous/current IVDU	Facebook Dating	0.038
Sex while drunk	Dinky One	0.024
Sex without condom but with other contraception		0.030
<b>Risky Sexual Behaviour (Risk Perception):</b>	<b>Dating App:</b>	
Multiple sexual partners	Grindr	0.021
	OkCupid	0.017
	Hinge	0.032
	Feeld	0.032
Sex while drunk		

Sex with current or previous IVDU	Dinky One	0.047
		0.026
Casual sex	Her	0.021
<b>Considerations After Sex:</b>	<b>Dating App:</b>	
UTI	Bumble	0.013
Cancer	Grindr	0.039
HIV/AIDS	Badoo	0.035
Local soreness/pain		0.018
Emotional issues	TanTan	0.011
<b>Contraception:</b>	<b>Dating App:</b>	
None	Badoo	0.049

\*Fisher's Exact Test

Use of Facebook Dating has been associated with having 0 sexual partners in the previous 12 months prior to questionnaire completion. Use of the dating app Scruff was significant with an association of approximately 6-10 partners ( $p = 0.017$ )

Use of Facebook Dating has been associated with not having sexual relations with individuals who were previous or currently injected drugs. Dinky One users were associated with having sex while drunk and having sex without a condom but with other contraception ( $n = 2$ ).

In terms of risk perception, Grindr and OkCupid users were found to agree that having multiple sexual partners put a risk to one's health. Hinge users tend to disagree with this ( $n = 1$ ). Dinky One users were found to have a neutral risk predisposition to having sexual relations with an individual who was currently or previously injected drugs. They were also found to have negative 'Disagree' or neutral predispositions to having sex while drunk.

Badoo users agree that considerations of HIV/AIDS are important but have

neutral views on local soreness/pain after sex. TanTan users (n = 1) were found to have a strong predisposition not to consider emotional issues post-sexual encounters. Feeld users (n = 1) disagreed that multiple sexual partners posed a risk to health. Her users (n = 1) were found to have significant associations with very low risk perceptions of casual sex. When considering contraception, users of Badoo were significantly linked to not using contraception. No other statistically significant correlations were found between regular contraceptive use and dating apps.

Using dating apps a few times a week and 1-4 times daily were linked to respondents having had sexual relations in the previous 12 months. No other significant associations were found.

#### 4.2.9.4 Motivations and Sexual Behaviours

The correlations between motives driving dating app use and various aspects of sexual behaviours, including knowledge of SAIs, sexual health services, contraceptive use, practice of risky sexual behaviours and considerations post-sexual intercourse are summarized in Table 19 following:

Table 19: Table summarizing significant associations obtained when relating motivations for dating app use and sexual health knowledge (SAIs, health services).

Motivation	Sexual Behaviour	P-value*
	<b>SAI knowledge:</b>	
Social Approval	Trichomoniasis	0.037
Sexual Experience	Mpox	0.029
	Pubic lice	0.034
	Scabies	0.024
Improve flirting/social skills	Hepatitis	0.037
Getting over an ex-partner	Chlamydia	0.047
Peer pressure	Pubic lice	0.010
Connect and meet new people of	Chlamydia	0.014

same sexual orientation	HTLV	0.038
Pass time	Non-specific genital infection	0.008
Distraction	HPV Zika	0.008 0.020
	<b>Sexual Health Service:</b>	
Sexual Experience	Caritas	0.025
Use when travelling	Breast screening CVSA	0.016 0.033
Sense of belonging	HIV clinic Women and Men's Health Physiotherapy	0.030 0.032
Peer pressure	ART Cervical screening Gender wellbeing clinic	0.031 0.033 0.025
Distraction	Richmond Foundation	0.045
Curiosity	Richmond Foundation Cervical Screening CVSA	0.031 0.038 0.035
	<b>Risky Sexual Behaviours (Practices):</b>	
Seek Relationship	Sex with partner with SAI	0.026
Sexual Experiences	Casual Sex Sex with partner who has SAI	0.035 0.044
Pass time	Casual Sex	0.033
Sense of Belonging	Multiple sexual partners	0.028
Peer Pressure	Sex with current or previous IVDU	0.026
	<b>Contraceptive Use:</b>	
Seek Relationship	Contraceptive Pill Intrauterine device Sex with partner who has SAI	0.029 0.042 0.044
Use when travelling	Withdrawal	0.049
Peer pressure	Natural Family Planning	0.005

\*Fisher's Exact Test

Dating app use being motivated by social approval was associated with lack of knowledge about trichomoniasis (n = 22). Somewhat agreeing that dating app use is

motivated by making sexual experiences was associated with lack of knowledge of mpox (n = 17), but with knowledge of pubic lice (n = 25) and scabies (n = 17). Knowledge of hepatitis was associated with mild agreement with the statement that dating app use is motivated to improve flirting/social skills. Mildly agreeing with motivations of connection with people and singles of same sexual orientation was linked to knowledge of chlamydia (n = 31) and lack of knowledge on HTLV (n = 38). On the same scale, motives of passing time were associated with lack of knowledge of non-specific genital infections (n = 24). Similarly, distraction motives associated with knowledge of HPV (0.008), lack of knowledge of Zika (n = 35).

Mildly positive correlation of use of dating app use with getting over an ex-partner was significantly linked to knowledge about chlamydia (n = 26). Strongly disagreeing with motives involving peer pressure was linked to knowledge on pubic lice (n = 31), cervical screening services (n = 26) and lack of knowledge of ART (n = 38) and gender wellbeing clinic (n = 36).

When considering sexual health services, knowledge of Caritas (n = 19) was found to be significantly associated with individuals who somewhat agree their dating app use is motivated by development of sexual experiences. Using dating apps when travelling was significantly associated with knowledge of breast screening (n = 21) and unawareness of CVSA services (n = 25). Strongly disagreeing with motives of belonging prompting dating app use predisposed users to knowledge of HIV clinic (n = 16) and lack of knowledge of women and men's health physiotherapy (n = 29). Mildly agreeing that dating app use was incentivized as a means to provide distraction and for curiosity was associated with knowledge of Richmond Foundation (n = 23); the latter was also associated with knowledge of cervical screening (n = 25) and lack of knowledge of CVSA (n = 29).



In terms of risky sexual practices, having a mild positive association with relationship motives was associated with the protective factor of not having sex with a partner with SAI (n = 34). This was also associated with lack of regular use of contraceptive pill (n = 30) and intrauterine devices (n = 34).

Being positively driven to use GNDAs for sexual experiences was significantly linked to practices of casual sex (n = 19) and not having intercourse with a partner who has an SAI (n = 31). Using GNDAs to pass time has been significantly correlated with the absence of casual sex (n = 23).

Not using GNDAs to seek a sense of belonging was in turn associated with the absence of multiple partners (n = 31). Similar negative associations between peer pressure motives were associated with absence of sex with individuals who currently or previously injected drugs (n = 42) and natural family planning (n = 42). Not using GNDAs when travelling was linked to not utilizing the withdrawal method as a regular contraceptive method (n = 16).

#### 4.2.9.5 Sexual Behaviour and Perceived Risks and Benefits

The correlations between perceived risks and behaviours and various aspects of sexual behaviours, including knowledge of SAIs and sexual health services, are summarized in Table 20 following:

Table 20: Table summarizing significant associations obtained when relating sexual health knowledge (SAIs, services) with perceived risks and benefits of dating app use (1)

<b>Perception</b>	<b>SAI Knowledge</b>	<b>Sexual Health Service</b>
Body Image	Chlamydia (p = 0.016) Hepatitis (p = 0.025)	GU clinic (p = 0.025) Servizz Ghozza (0.014)
Self-esteem and self worth	Chlamydia (p = 0.042)	
Comparison to other users	Syphilis (p = 0.044) Zika (p = 0.004)	Gender wellbeing clinic (p = 0.018) Richmond Foundation (p = 0.031) Women and Men's Physio (p = 0.046)
Positive Experience		HIV Clinic (p = 0.011) Servizz Ghozza (p = 0.014)
New Sexual skills		GU Clinic (p = 0.011) HIV Clinic (p = 0.038)
Skills in dealing with Rejection	Non-specific genital infection (p = 0.033)	
Feel good when matched/contacted many times	Mpox (p = 0.013) Shigella (p = 0.027)	
New Horizons		Cana Movement (p = 0.021)
Not Intimidating	Chlamydia (p = 0.041) Trichomoniasis (p = 0.037) Pubic lice (p = 0.045)	CVSA (p = 0.037)
Less time and effort	Zika (p = 0.008)	
Used everywhere		Victim Support Agency (p = 0.013)
Element of Control		HIV Clinic (p = 0.023)
Enough Security		HIV Clinic (p = 0.006)
Impact on Intimacy		Breast Screening (p = 0.045)
Impact on Privacy		GU Clinic (p = 0.045) Rainbow Support Services (p = 0.016)
Superficial		Cervical Screening (p = 0.031) HPDP (p = 0.001)
Easily localized and identified		ART (p = 0.006) Cervical screening (p = 0.024) Servizz Ghozza (p = 0.019)
Personal data collected by users		Cervical screening (p = 0.085) Gender wellbeing clinic (p = 0.042) HIV clinic (p = 0.038) MGRM (p = 0.029) Maternal medical health (p = 0.017) Women's and Men's Physio (p = 0.035)
Personal Data collected by app software	Scabies (p = 0.047)	Cana Movement (p = 0.042) Maternal Medical Health (p = 0.010) HPDP (p = 0.048)

Significance test: Fisher's Exact Test.

A mildly positive correlation between body image and dating app used was

found to be associated with knowledge of chlamydia (n = 29) and hepatitis (n = 22). Chlamydia knowledge was also found to be significantly linked to individuals who agree that there is a link between GNDA use and self-esteem and self-worth (n = 43). It was also associated with knowledge of GU clinic (n = 27), and not knowing about Servizz Ghozza (n = 022).

Similar results were obtained between comparison of oneself to other users and syphilis knowledge (n = 27) and lack of knowledge of Zika (n = 23). Neutral and mildly positive predispositions to this variable was significantly associated with lack of knowledge about Gender Wellbeing clinic (n = 17), Richmond Foundation (n = 16) and Women and Men's Health Physiotherapy (n = 0.046).

Having a neutral predisposition to the perception of overall positivity of GNDA use was significantly linked to knowledge of HIV clinic (n = 19) and lack of knowledge on Servizz Ghozza (n = 33). Mildly negative predispositions to the association between GNDAs and the development of new sexual skills significantly predisposed to knowledge of GU clinic (n = 26) and lack of knowledge of HIV clinic (n = 19).

Neutral and mildly negative perceptions that dating apps allow the development of skills in dealing with rejection were associated with lack of knowledge of non-specific genital infections (n = 28). Positive correlations between feeling good when one is contacted multiple times/matches with other users is associated with lack of knowledge of mpox (n = 24) and shigella (n = 33). On a similar level, positive perceptions that GNDAs offer new horizons for communicating are associated with lack of knowledge about Cana Movement (n = 34).

Knowledge of Chlamydia (n = 27), pubic lice (n = 26) and lack of awareness of trichomoniasis (n = 34) were associated with neutral perceptions of dating apps as being not intimidating and having impacts on privacy. This variable was also associated with lack of knowledge of CVSA (n = 27). Breast screening (n = 29) and GU Clinic (n = 27) knowledge was found to be significantly associated with neutral perceptions of intimacy and privacy respectively. The latter was also linked to lack of knowledge of Rainbow Support Services (n = 33).

Positive perceptions of GNDAs requiring less time and effort were associated with lack of knowledge of Zika (n = 32). Similar levels were found between perceptions that GNDAs can be used anywhere and lack of knowledge of Victim Support Agency (n= 37), and between perceptions of element of control and neutral perceptions of security and knowledge of HIV clinic (n = 30).

Neutral perceptions on superficiality of dating apps were significantly associated with lack of knowledge of HPDP (n = 23). Mildly negative perceptions of ease of localizability and identifiability were linked to lack of knowledge of ART (n = 0.006) and Servizz Ghozza (n = 24) and knowledge of cervical screening (n = 20). The latter was also linked to positive perceptions that personal data is collected by users (n = 28). This was also associated with lack of knowledge of gender wellbeing clinic (n = 31), Women and Men's health physiotherapy (n = 36) and maternal medical health (n = 30) and knowledge of HIV clinic (n = 23) and MGRM (n= 28).

The correlations between perceived risks and behaviours driving dating app use and various aspects of sexual behaviours, including knowledge of SAIs and sexual health services, are summarized in Table 21 following:

Table 21: Table summarizing significant associations obtained when relating sexual health knowledge (SAIs, services) with perceived risks and benefits of dating app use (2).

No	Sexual Behaviours	Contraception
Body Image		
Self-esteem and self-worth	Sex while drunk (p = 0.018)	None (p = 0.010)
Comparison to other users		Withdrawal (p = 0.036)
Positive Experience	Multiple sexual partners (p = 0.035)	Condoms (p = 0.028)
New Sexual skills	Multiple sexual partners (p = 0.002)	
New Horizons		Intrauterine device (p = 0.011)
Not Intimidating		None (p = 0.029)
Element of Control		None (p = 0.045) Condoms (p = 0.019)
Enough Security	Sex with current or previous IVDU (p = 0.020)	
Impact on Privacy		Withdrawal (p = 0.021)
Personal Data collected by app software		None (p = 0.024) Condoms (p = 0.020)
Accessed by Everyone		Contraceptive pill (p = 0.038)
Free		None (p = 0.032) Condoms (p = 0.004)

Significance Test: Fisher's Exact Test.

Positive perceptions of self-esteem and self-worth were associated with absence of sex while drunk and contraceptive use (n = 41), including condom use (p = 22). Other protective behaviours include lack of multiple partners and neutral perceptions of GNDAs being a positive experience overall (n = 34) and low scores on development of new sexual skills (n = 31). More protective behaviours were identified; neutral perceptions of security were linked with absence of sex with previous or current intravenous drug users (n = 37).

The withdrawal methods were significantly associated with individuals who have neutral and positive perception of comparing themselves to other users (n = 26). Neutral and mildly positive perceptions of dating apps offering new horizons for communications are associated with lack of intrauterine device (p = 56). Similarly,

positive perceptions of accessibility of GNDAs have been associated with lack of contraceptive pill use (n = 54).

Perceptions that dating apps are free are related to condom use (n = 26) and contraceptive use (n = 32). The latter is also true with positive perception that GNDAs offer element of control (n = 43), which has also been linked to condom use (n = 38). Other protective behaviours were associated with the perception that dating apps are free, and that personal data is collected by app software (n = 34). No other significant findings were found.

## 5 Discussion:

### 5.1 Introduction

This chapter aims to discuss the results of the statistical analysis presented in the previous chapter. It will be divided into the outcomes defined throughout this dissertation and will discuss features of Maltese dating app user's knowledge attitudes and behaviours.

The chapter will conclude with an analysis of the strengths and limitations of the study. To the best of our knowledge, this study is the first of its kind in the Maltese islands, with conclusions made about the study valid for the population analysed.

### 5.2 User Characteristics

Analogous to literature findings, the majority of dating app users were young, belonging in the 25-34-year age group (Gatter & Hodkinson, 2017; Castro & Barrada, 2020; Choi et al., 2021; Garga et al., 2021a), and had attained at least a tertiary level of education. The presence of a large proportion of individuals of tertiary and post-graduate level educational attainment is also representative of the literature, with a high representativity due to a considerable amount of studies regarding GNDAs being done on university students (Anzani et al., 2018; Castro & Barrada, 2020) but also corroborated by multiple other research bodies (Goedel & Duncan, 2015; Zou & Fan, 2017; Wang et al., 2018; Castro & Barrada, 2020; Liberacka-Dwojak et al., 2023).

However, it was found that the female gender was more prevailing than the male gender, contrary to what the original literature suggests (Queiroz et al., 2017). However, recent studies have suggested that there is no significant difference between genders (Castro & Barrada, 2020). This difference could also be due to the

tendency to have underrepresentation of males in survey responses (Rourke & Lakner, 1989).

The proportion of individuals born in Malta and those who were foreign-born was analogous to the ratio obtained from the latest NSO census which indicates a presence of 5:1 Malta and foreign-born individuals (NSO, 2023a). On the other hand, the LGBTIQ+ fraction was found to be higher than that identified in the 2019/2020 EHIS (equivalent to 2.5%). However, a recent global survey suggested that 9% of adults identify as being part of the LGBTIQ+ community, found to be increasing over time (Ipsos, 2023), which would be in line with the survey findings.

In terms of relationship status, there were approximately equal amounts of individuals in an exclusive relationship, those who were casually dating and those who were single and not actively dating. This could mean that dating apps had played a role in the formation of the exclusive relationship, or the individual had used dating apps in the past but formed a long-term relationship through other media, or that individuals were in an exclusive relationship whilst also being active users on GNDAs. The latter proportion has indeed been recently found to have an increasingly active presence in GNDAs (Castro & Barrada, 2020; Castro et al., 2020). Further analysis is required to aid in this elucidation. Considering the proportion individuals who are casually dating and single and not actively dating, this would be in line with literature findings which suggest that a single relationship status is a considerable predictor of dating app use (Timmermans et al., 2018; Castro et al., 2018).

Most of the survey respondents had undergone formal sexualities and relationships education, which was in turn expected to yield better sexual health outcomes. However, there is paucity of data in the literature linking these two variables together and further studies are needed.



Public health considerations regarding the identification of user characteristics of dating apps can allow targeted health promotion campaign and efficient use of limited resources available. Given the local dearth of information on dating app users, characterization of the target population is the first step to the delineation of further studies to deepen the knowledge of this new aspect of health. A multi-level, multi-method approach would be ideal to tackle such this novel digital population.

### 5.3 Usage Patterns

The most popular dating apps were found to be Tinder, Bumble, Badoo and Facebook Dating. The most popular dating app which specifically targets GBMSM is Grindr, followed by Scruff. This is in line with the literature (Wu & Ward, 2018; Ceci, 2023).

Interestingly, Facebook Dating is a novel, yet popular means how Maltese residents interact with each other. This finding suggests that the ubiquitous presence of social media in Maltese society (Misco, 2023; NSO, 2024) may also be having a cascade-like effect on negotiations of romantic and sexual encounters. It suggests that the confluence between social media and dating apps is becoming more blurred with time.

Another consideration of note is the identification by respondents of niche dating apps, which follows their increase in popularity in recent years (Anzani et al., 2018). This implies that as the dating app sphere continues to evolve, specialization of these technologies allows like-minded sub-populations to connect. Despite using multiple apps on average, most survey respondents used a single GNDA in the previous 12 months prior to completion of questionnaire.

Studies suggest that dating app users, particularly GBMSM tend to use multiple GNDAs (Dhoest, 2022).

As expected, the male gender was associated with the popular GBMSM dating app Grindr, who is the target demographic; other similar dating apps were not significantly associated. To further investigate this, similar studies can be carried out specifically targeting the GBMSM community to allow a more textured analysis of this subpopulation. Target populations were also confirmed in the case of Facebook Dating (heterosexual orientation) and Grindr and Scruff (homosexual orientation).

Associations between age and individual dating apps (Tinder, Connecting Singles), points at further nuances of GNDAs, implying that dating apps are also used by older adults, similar to the recent increase in popularity of GNDAs in this demographic (Smith, 2016) and that there are particular dating apps they gravitate to in order to achieve outcomes expected. This argument can also be applied to the choice of specific dating apps with respect to educational attainment and potentially other sociodemographic characteristics.

The considerable sociocultural changes in the Maltese islands which occurred in the last decade, particularly with the substantial rise in foreign-born individuals residing in Malta (NSO, 2023a) could also potentially lead to implications in terms of negotiations of romance and sexual encounters. This was alluded to in this study by the identification of a significant relationship between being foreign-born and the dating app Dinky One. Considerations of this impactful variable and its sexual health implications should be considered in future works.

The popular methods of discovery of dating apps (word of mouth and social

media) confirm the strong relationship and converging aspects between social media and GNDAs. This can also have health promotion implications, with social media utilized as a proxy platform for individuals who use dating apps.

This study found that the frequency of dating app use was surrounding the few times per week to daily (up to 4 times). A considerable proportion of the survey respondents had used dating apps in the past but not in the previous 12 months. This is analogous to multiple studies which suggest that a considerable proportion of individuals use GNDAs daily (Queiroz et al., 2017; Dai, 2023), however frequency ranges have been reported to also vary considerably in the literature (Barrada & Castro, 2020).

This suggests that dating app users in this sample used GNDAs relatively frequently. From a public health perspective, this could have important implications when considering using GNDAs as media for dissemination of sexual health information. This is because individuals who use dating apps would potentially be exposed to sexual health information often, possibly even for multiple times a day.

The analysis of dating app usage frequency can also be further explored by examining duration of use, particularly duration of use in one sitting, and linking that to future research of problematic dating app use. Another aspect to consider is the circadian pattern of GNDA use, that is, when the dating app users are accessing GNDAs. This could also be utilized to maximize effective health promotion efforts.

Offline encounters were varied, with the most popular activity being, in descending order, sexual encounters, romantic relationships and meetings/dates

being the most popular activities. This consolidates the impression that dating apps are indeed a vessel utilized to negotiate and partake in sexual activities, for this sample. Consensus with the literature is limited, in that multiple conclusions have been made, some correlating with the findings, and others suggesting that friendships were the most popular offline outcome of dating app use (Castro & Barrada, 2020; Tomaszewska & Schuster, 2020).

Interestingly, formal sexualities and relationships education has been linked to offline encounters relating to forming relationships. This could potentially be due to conventional teachings of protective behaviours of being in an exclusive relationship and not having multiple sexual partners.

Identification of GNDA usage patterns can act as important tools in the health promotion arsenal. Knowing what the most popular apps and their target populations are, frequency of use and identification of offline encounters can help maximize efficiency of health promotion campaigns. Social media platforms can also be potentially considered as proxy means of targeting dating app use. Further aspects of interest would be the analysis of the activities related to the setting up of a dating app profiles and associated health sequelae.

#### 5.4 Motivations

In the general context, the study findings suggest that motivations behind dating app use for the sample population were diverse, ranging from entertainment to mindless passage of time to social, relational and romantic catalysts, despite the underlying narrative that tends to simplify GNDA use as being solely a means of organizing casual sex. This is congruous to the literature findings, which consistently argue that motivations behind dating app use are

much more complex and nuanced than simply catering for sexual motivations (Holloway et al., 2014; Goedel & Duncan, 2015; Gatter & Hodkinson, 2017; Sawyer et al., 2018; Ciocca et al., 2020; Castro & Barrada, 2020; Marston et al., 2020; Hermosa-Bosano et al., 2021a; Choi et al., 2021; Bineau et al., 2021; Blake et al., 2022; Dhoest, 2022; Liew et al., 2023; Liberacka-Dwojak et al., 2023).

Gender considerations with respect to motives in the study population were found to indirectly mirror the literature. Whereas no associations were found between the male gender and individual motives, female respondents were found to disagree that sexual experiences motivate their GNDA use. The literature suggests that sexual experiences and forming long-term relationships tend to be strong motives for GNDA use of the male gender (Gatter & Hodkinson, 2017; Newett et al., 2018; Griffin et al., 2018; Orosz et al., 2018; Castro & Barrada, 2020; Tavares et al., 2020). Other studies have found the contrary (Barrada & Castro, 2020; Barrada et al., 2021), an association which was not found in the study population. Further analysis with a larger sample population is warranted to be able to discern any potential significant associations.

Motivations of curiosity and seeking relationships were associated with higher levels of educational attainment. This could potentially be due to greater access to digital and technological media. Higher education also promotes exploration and critical thinking, which may possibly permeate even in the motives behind dating app use. Higher educational attainments may also lead to a lack of time to seek relationships in the traditional methods due to potential time constraints, leading to these individuals to opt to use GNDA's instead.

The relationship between the other motives and sociodemographic

variables in the sample population was found to potentially be due to chance. Further studies on motivations using a larger sample population are warranted in order to be able to break down further any subtle relationships with the other sociodemographic variables which were not found to be significant in the sample population.

From a public health perspective, motivations behind GNDA use can in turn be utilized to target associated health behaviours and design tailored health interventions, behavioural change campaigns (where applicable), potential regularization of dating app platforms and devising effective health education campaigns.

### 5.5 Perceived Risks and Benefits

Most respondents indicated always feeling good when matching or when contacted multiple times, frequently feeling that GNDAs had an impact on their self-esteem and self-worth, sometimes or rarely feeling that dating apps were a positive experience overall and never feel that dating apps have taught them new sexual skills.

Respondents also strongly opposed the perception that personal data is collected by users, and had neutral predispositions towards perceptions of privacy, intimacy and security issues. They agreed that they offer new horizons in meeting new people and strongly concurred with the fact that they can be used everywhere.

These results suggest the need for further considerations of the impact of GNDAs on self-esteem and self-worth, and to possibly consider this as an intervention target in health promotion campaigns directed at dating app use and

can direct future research.

The conclusions made for the study population has mirrored literature findings, some of which positive attributes to GNDA use (Castro & Barrada, 2020; Patten et al., 2020). However, the study population also led to neutral to negative associations for the same variable, when considering relationship status. Discussion of the potential reasons behind this is limited, due to its broad nature. Moreover, the lack of temporal aspect also plays an important role and is not included and may play an important role.

The neutral predispositions to issues of safety, privacy and intimacy may need to be further explored, with the literature suggesting these have been identified as negative sequelae of GNDA use (Marston et al., 2020; Bonilla-Zorita et al., 2021; Liew et al., 2023).

The male gender has been found to have neutral predispositions at the perceived notion that GNDA use is linked to comparison of oneself to others. This has been partially reflected in the literature, which however mostly focused on GBMSM (Castro & Barrada, 2020; Tomaszewska & Schuster, 2020). This finding suggests that more effort needs to be focused on males and their mental health, at least in the context of dating app use.

Heterosexual respondents were found to oppose the perceived notion that dating apps were used to develop new social skills, which was in turn found to have a positive association in the LGBTIQ+ study subset. It could be the case that due to stigmatization and marginalization of the LGBTIQ+ section, dating apps have taken the role of the medium which leads to sexual encounters, and dating apps may act as an inclusive space where these individuals can freely

express their preferences and actively use GNDA to explore their sexual identity and sexual expression (Zou & Fan, 2017; Wang et al., 2018; Obarska et al., 2020; Hermosa-Bosano et al., 2021a; Dhoest, 2022) compared to heterosexual respondents. However, this finding needs to be explored further.

The heterosexual sample population also indicated a positive perception of the impression that dating app users may be easily identified and localized, and personal data collected by users compared to the LGBTIQ+ counterparts. This may potentially be due to this population having a more heightened sense of scrutiny in online dating spaces, and possible residual stigmatization of being GNDA users compared to the LGBTIQ+ population who have populated dating apps since their inception (Orchard, 2019). However, further studies need to be carried out to factually corroborate these hypotheses.

The positive association between the female gender in the study population and multiple benefits of GNDA use. These included the perception they offer new horizons in meeting new people, allow you to connect with individuals who are geographically close and that they are free. This may be due to the impression that dating apps allow for access to a larger pool of potential matches (Orchard, 2019).

Potentially, traditional gender norms may have limited a female from approaching a potential partner, in the conventional settings and this could also potentially be translated in the digital arena. In fact, Bumble, one of the most popular dating apps used by the sample population was specifically designed to only allow women to 'make the first move' by initiating a conversation with a previous match.



Limited extrapolations can be made with respect to the association between formal sexualities and relationships education and neutral predispositions to the impact of dating apps on intimacy and privacy due to the dearth of information on the subject. This is also applicable to the analysis of the reasoning behind the association between positive perceptions of control in GNDAs and relationship status. Analysis of such a relationship involves the decoding of the complex interplay between individual preferences, psychological and personality attributes within self and in relationships and associated coping mechanisms. This can be addressed in further studies.

The link between educational attainment and positive perceptions on the impact of dating app on intimacy and its superficial nature may potentially be due to possible sociological and psychological awareness and understanding of the myriad ramifications and complexities of dating app use and how these impact modern connections.

Perceptions of risks and benefits of dating app use and ensuing knowledge on the myriad associated parameters can help shed a light on the associated attitudes and practices surrounding its use. This can in turn aid in the design of health promotion campaigns that are successful in their engagement and participation.

## 5.6 Sexual Behaviours

The highest frequency of SAIs which the survey respondents were aware of was of HIV/AIDS, gonorrhoea, syphilis and chlamydia and lower awareness of HTLV, lymphogranuloma venereum and pinworms. These results are similar to the conclusions obtained in a recent Greek study (Voyiatzaki et al., 2021).

Significant associations between the 25-34-year age group were significantly associated with a number of SAIs, which represents the majority of the GNDA users according to this study and the literature findings (Goedel & Duncan, 2015; Queiroz et al., 2017; Castro & Barrada, 2020; Castro et al., 2020). This implies that there is some knowledge of SAIs in the major demographic which populates GNDAs. Moreover, having formal sexualities and relationships education was significantly associated with awareness of the less common SAIs (lymphogranuloma venereum, mycoplasma genitalium, HTLV and granuloma genitalium). The latter two were also associated with informal sexual health education. This implies that positive outcomes are linked to formal and to a lesser degree, informal sexual health education with respect to awareness of the lesser-known SAIs.

The Malta-based sexual health services which were known the most by the survey respondents were GU clinic, breast screening, Richmond Foundation and Caritas, with the least-known being Servizz Għożża, CVSA and women and men's health physiotherapy. This could possibly be due to the fact that the latter are niche services which cater for pregnant minors and sexual assault victims and women and men's health physiotherapy could potentially be non-specific to sexual health. Being born in Malta was a significant predictor of knowledge of a number of sexual health services for the sample population, including the GU clinic.

This conclusion is important with respect to public health interventions, which should significantly identify the most effective routes of reaching foreign-born Maltese residents, which contribute to a significant proportion of the population (NSO, 2023b). A heterosexual orientation was also found to be a

significant determinant of knowledge of gender wellbeing clinic in the sample population. This could signify the important sociocultural changes and mainstream availability of information on trans persons. Identification of the background knowledge of SAIs and Malta-based sexual health of dating app users can aid in the identification of lacunae in knowledge and service provision. This, however, needs to also be correlated to behaviour, in that knowledge does not necessarily translate to behaviour change. It is the latter which then leads to various health outcomes.

The second aspect of the survey involved analysis of sexual behaviours. Two-thirds of respondents had partaken in sexual activities in the previous 12 months and one-third had not, with most of the former having had one sexual partner, followed by 2-5.

Being in an exclusive relationship predisposed to having had sexual encounters. As expected, being single and not dating was associated with no sexual partners and having 2-5 partners in the previous two months with casual dating. Recent research on sexual trends in Malta found that most of their respondents had 2-5 different sexual partners in their lifetimes, the number increasing with decreasing age (The Sex Clinic Malta, 2023). The literature tends to focus on comparisons of sexual practices of dating app users versus non-users (Choi et al., 2016; Huang et al., 2016; Zou & Fan, 2017; Wang et al., 2018; Sawyer et al., 2018; Jennings & Kypridemos, 2019; Ciocca et al., 2020; Tavares et al., 2020; Garga et al., 2021a; Garga et al., 2021b; Ren et al., 2021; Power et al., 2022; Dai, 2023; Liberacka-Dwojak et al., 2023).

As expected, casual dating has been significantly associated with having casual sex. Being in an exclusive relationship and being single and not activelyh

dating was in turn associated with lack of multiple partners. The former was also significantly associated with the practice of having sex without a condom but with other forms of contraception. This could be due to the protective behaviour of having one sexual partner and the reduced risk of acquiring an SAI.

Survey respondents aged between 25-34 years (that is, the most prevalent group of users of dating apps have been found to have significant associations with having sexual relations while drunk. This age group has also been found to drink regularly (Directorate for Health Information and Research, 2023). The literature has suggested that alcohol and substance use can be considered powerful predictors of increased risky sexual behaviours (Boonchutima & Kongchan, 2017; Wang et al., 2018) and play an important confounding role when considering the role GNDAs play in risky sexual behaviours (Ciocca et al., 2020).

Concerningly, having formal sexualities and relationships education in the sample population has been linked to having sex without contraception. This implies there is a definite gap between what is being taught and actual sexual behaviours which could be a priority to target from a public health perspective. Partially related to this is the association found between the male gender and having sex without a condom but with other forms of contraception. However, this association could also be due to cultural nuances, wherein Maltese residents still tend to not use condoms (Times of Malta, 2019).

The respondents were then asked to categorize the perceived risk of the same statements of sexual behaviours which they responded to have partaken in (or otherwise). The literature linking risky sexual behaviours to dating app use is conflicting in nature (Newett et al., 2018; Ciocca et al., 2020; Castro & Barrada,

2020; Bonilla-Zorita et al., 2021; Choi et al., 2021; Garga et al., 2021b)

Females reported a significant link to reports of very high risk related to casual sex, sex while drunk, having multiple sexual partners and sex without contraception. This could potentially be due to the complex interplay of traditional gender norms, with females being more risk-averse, perception of vulnerability and biological differences. Further studies need to be carried out to assess this complex dynamic.

Study respondents with higher levels of educational attainment are linked to increased awareness that sex without contraception is very high risk. This could potentially be due to their ability to have access to information and critically appraise it effectively, as well as having adequate health literacy skills. Other socioeconomic factors may also be at play, with individuals with a high level of educational attainment having better access to healthcare resources, thereby impacting their views on risk. However, formal analyses need to be carried out to identify the actual causes of this correlation.

Another important gap identified within the study population is the association between a heterosexual orientation and lack of regular contraceptive use, which was also reflected in the recent EHIS results which suggest that 41.2 percent of respondents had never used contraception in the previous 12 months prior to completion of survey (Directorate for Health Information and Research, 2023).

Moreover, being born in Malta was associated with low perception risk of discussion of SAI status and boundaries. However, further studies are required to see whether this lack of risk perception translates into actual discussions of sexual

health status and associated boundaries. The literature suggests that these can be as low as 50% (Hermosa-Bosano et al., 2021b; Garga et al., 2021b).

Only 3.2% of respondents used PrEP/PEP regularly, whereas ECDC reports indicate that Malta had an approximate prevalence of PrEP use among MSM of approximately 5.5 percent (ranging between 0-8.6 percent among the 40 countries in the report). Further studies specifically looking at GBMSM and their PrEP/PEP use are warranted to be able to formally extrapolate findings. Studies suggested that GNDAs users were associated with higher levels of PrEP intake (Hoenigl et al., 2020).

Pregnancy considerations post-intercourse were very important in individuals who were in an exclusive relationship and those who were single and not actively dating. This could potentially be due to complex interplay between individual healthcare experiences, healthcare resource access, sociocultural norms and expectations, relationship dynamics and reproductive and other physical and psychological health considerations. This is particularly of note in the 25-34 age group, which is a considerable portion of the female reproductive window and where individuals may be focusing on starting a career or family post-studies.

Moreover, the female survey respondents were also linked to placing high importance on considerations of cancer, local soreness or pain, emotional considerations and urinary tract infections. These considerations highlight the intricacies of female health experiences, wherein sexual health considerations for females interact with the female anatomy to create a need to identify and target gender-specific challenges and ensure sensitivity in delivery of appropriate

healthcare which meets their needs.

Interestingly, when considering the sample population, being born in Malta was linked to perceptions that considerations of physical issues related to body image and self-esteem were deemed as not being important or of a neutral nature. This could potentially be associated with a recent study carried out in 65 nations which suggests that people living in Malta top the list for body positivity (Swami et al., 2023). However, further formal studies need to be carried out to formally analyse this association.

Knowledge on the perceived risks and actual sexual practices, together with the most important considerations post-sexual intercourse can help triangulate and identify priority areas in healthcare message delivery and to ensure that sexual health promotion campaigns both target the highest concern for the recipients as well as addressing gaps in healthcare services.

## 5.7 Links to Usage Patterns

When considering the significant associations between individual dating apps and motivations, a pattern of use emerges. The use of Grindr and Scruff were solely significantly associated with motivations to develop sexual experiences. This consolidates the assumption that dating app users navigate different dating apps to target different expectations. Grindr and Scruff are dating apps targeting GBMSM and are mostly known for being a platform for organization of casual sexual encounters.

Facebook dating was associated with the motivation to use dating apps to cultivate a sense of belonging ('everyone uses dating apps'). Further studies are

needed to break down the nuances of this association.

The associations in Table 15 showcase the complexities of the motivations behind the needs of dating app users and the individual dating apps. Extrapolation of results for the less popular dating apps is limited. Further analyses are required to be able to assess the intricate connections between these variables on a larger population.

When considering discovery methods and motives behind dating app use, social media was found to be significantly associated with connecting and meeting new people and singles of the same sexual orientation. One could argue that these motives are also similar to the ones which prompt social media use in the first place. This again suggests the interplay between social media and dating apps.

Comparison of individual dating apps to perceived risks and benefits further corroborates the link between Grindr and Scruff for sexual motives and expected outcomes. To be able to express the complexities of the interlinking between the different perceived risks and the origin for such perceptions effectively, there is a need for appropriate research which targets the associated components. Similar to the previous case, extrapolation of results for the less popular dating apps is limited. Further analyses are required to be able to assess the intricate connections between these variables on a larger population.

Correlation of individual dating apps with knowledge (or lack thereof) of SAIs and sexual health services is an adequate means of identifying gaps in knowledge and targeting them individual in the appropriate platforms. For example, if a Bumble user is found to be significantly associated with a lack of knowledge of chlamydia (as is the case), health promotion interventions can



specifically target that need. The argument also applies for lack of knowledge of sexual health services.

Use of the dating app Scruff was significantly associated with having approximately 6-10 social partners in the previous 12 months. Facebook Dating has been associated with not having sexual relations with individuals who were previous or currently injected drugs. This information is ideal to be able to design a health promotion campaign which targets the actual leading risky sexual behaviours of the different dating apps, also applicable for risk perceptions of different sexual behaviours, particularly if incorrect. For example, if the use of a particular dating app is linked to an erroneous perception that having sex while under the influence of alcohol has no impact on health outcomes can be targeted effectively in the same dating app. The same principle can also be applied to contraception. Badoo users were found to be linked to not using contraception. Health education efforts can specifically target this health behaviour.

## 5.8 Linking Sexual Behaviours

Having a mildly positive association with relationship motives was associated with the protective factor of not having sex with a partner with SAI. Being positively driven to use GNDAs for sexual experiences was significantly linked to practices of casual sex but also not having intercourse with a partner who has an SAI. Using GNDAs to pass time has been significantly correlated with the absence of casual sex. This could potentially be due to the fact that the expected outcomes of that motive are somewhat more buoyant. However, to be able to extract the subtle nuances of such associations, further studies are required. Despite inconclusive findings in terms of sexual health behaviours, some studies suggest that despite riskier sexual behaviours, dating app users are

also taking more preventative efforts (Castro & Barrada, 2020; Bineau et al., 2021; Garga et al., 2021a; Garga et al., 2021b; Knox et al., 2021).

Mildly negative predispositions to the association between GNDAs and the development of new sexual skills significantly predisposed to knowledge of GU clinic but also lack of knowledge of HIV clinic.

Positive perceptions of self-esteem and self-worth were associated with absence of sex while drunk and contraceptive use, including condom use. Such associations demonstrate the link between personality, psychological factors and sexual health behaviours, which need to be assessed appropriately.

Analyzing the significant associations between individual motives and sexual health attributes also has multiple public health implications. It allows addressing of misconceptions and the delivery of tailored education which meets the user's needs. To be able to effectively discuss the interplay between these two variables, thorough research including biopsychosocial and fiscal aspects needs to be done.

## 5.9 Dating Apps and Health Promotion

There were similar themes which emerged from recommendations from respondents and the literature. Respondents suggested using banners or advertisements in health promotion campaigns which are timed or unskippable, containing information from reputable sexual health information sources, parallel to other multi-level general sexual health information campaigns. The literature also suggests utilizing popular dating apps rather than creating new ones to eliminate concerns of low user ratings and infrequent downloads (Muessig et al.,

2013). This also has the advantage of reaching individuals with difficult access (Hoeneigl et al., 2020; Bineau et al., 2021; Dai, 2023).

Some recommendations offered by the users also included recent and regular uploads of sexual health status by the users, potentially also as a requirement to use dating app. However, the literature suggests that such declarations are dependent on knowledge of active status, willingness to disclose such information and accuracy (Huang et al., 2016; Hermosa-Bosano et al., 2021b; Chadwick et al., 2023) and may also be potentially associated with ostracization (Huang et al., 2016). This may also promote partner selection or rejection based on serostatus. Moreover, users may overlook profile information or confuse information between different profiles. The option to leave a blank HIV status can also lead to confusion which may have significant sexual health sequelae (Chadwick et al., 2023).

## 5.10 Strengths and Limitations

This study has multiple strengths. A complete dearth of information on dating app use in general and implications on health exists in Malta, making this study the first of its kind. This can then contribute to the formation of a contextual portrait of the phenomenon of dating apps in the Maltese islands, enriching knowledge on the subject matter in the process, whilst allowing for more effective and targeted sexual health information campaigns that reflect the nuances of the current digital era.

This study also made use of two validated questionnaires which maximized reliability and validity. Moreover, online dissemination of the questionnaire via Facebook Ads allowed specific definition of the population to be included,

ensuring representativity of the target study population. Online surveys are also advantageous in that they require complete collection of data, thereby limiting invalid responses considerably (Nayak & Narayan, 2019). They also have advantageous data quality and data security characteristics, facilitating data inputting and analysis. Completion of questionnaires were also available for evaluation in real-time and respondents could answer the questionnaire 24/7 in the comfort of their home (Andrade, 2020; Singh & Sagar, 2021). Interviewer and social desirability bias was minimized due to absence of assessor (Van Mol, 2017). Given the delicate subject matter, another advantage of using this method is the prevention of under-reporting of sexual health behaviours.

Several limitations could have impacted the analysis of the survey findings. The study focused on the characterization of dating-app users; therefore, interpretation of findings applies to the study population, with limited generalizability (Galesic & Bosnjak, 2008; Hansen & Smith, 2012; Evans & Mathur, 2018). Another main limitation is the low response rate, typically citing lack of interest and engagement and survey fatigue (Van Mol, 2017; Singh & Sagar, 2021) in the case of online surveys. This could lead to potential reduction in power and increased risk of Type II errors.

Facebook was utilized as a proxy for dating app users; the assumption was made that dating app users would also be active social media users, which could potentially create bias. This study can also act as a tool to help elucidate the optimal means of how to recruit and engage the Maltese resident population when there is a need to collect sensitive data related to sexual health digitally (or otherwise). This study showed that whilst there was interest in the study, it did not effectively translate to successful survey completion. This study has

uncovered a potential socio-cultural sensitivity when considering the digital sexual health interface and can in turn inform future similar attempts at data collection and sample recruitment.

The researcher could not determine whether the same individual answered the survey multiple times, or whether, despite putting declarations in place, individuals outside the inclusion criteria age range answered the questionnaire (Singh & Sagar, 2021). Moreover, given the delicate nature of questions about intimate and sexual practices, the sampling technique opted for is a non-probability (convenience) sampling, where individuals choose to complete the survey out of own volition.

Use of convenience sampling implies inherent limitations to formal statistical inferences. Moreover, since individuals self-administered the questionnaires, there may be a distinction between the individuals who opted to complete the questionnaire and those who did not (non-response bias) and were subject to inherent recall bias (Galesic & Bosnjak, 2008; Hansen & Smith, 2012; Evans & Mathur, 2018). Confounding factors were not assessed, which could leave an impact on the interpretation of results. Such an example would be the contribution of alcohol and substance abuse to risky sexual behaviours in GNDA's.

Upon consideration of these limitations, further research should also include non-users of dating apps, analysis of confounding factors, with efforts done to carry out randomized samples and maximize response rates. This would enhance representativity and ability to generate inferential data to the general population and ability to calculate prevalence, via the employment of a cross-sectional study.

## 6 Conclusions and Recommendations:

### 6.1 Conclusions

The aim of the dissertation was to be an exploratory study with the goal of gaining insights into the usage of GNDA in Malta and the associated knowledge, attitudes, and practices. To achieve this aim, several objectives were set, which involved the collection of data as well as user demographics. This was achieved by investigating outcomes pertaining to user characteristics, usage patterns, motivations, sexual behaviours and perceived risks and benefits. The data collected, conclusions drawn and relationships established have met the original aim and objectives and have effectively helped in generating multiple hypotheses which can in turn guide future research and help guide potential strategic direction.

The motivations, types and usage patterns of dating apps were similar to those noted in European or international studies. The results provided the information specified above in the sample population analysed. Most dating app users were female, young, (25-34-years), had attained at least a tertiary level of education. They were of a heterosexual orientation and were born in Malta. The responders were either in an exclusive relationship, dating casually or single and not dating. Most of them had undergone formal sexualities and relationships education. The gender discrepancy is an area which can be further explored, as it contradicts most studies which suggest that there is a higher proportion of male GNDA users. The most popular dating apps were found to be Tinder, Bumble, Badoo and Facebook Dating. The most popular dating app which specifically targets GBMSM is Grindr, followed by Scruff. Certain dating apps were preferred

by the older population, others by foreign-born Maltese residents. Certain niche dating apps were also identified by the survey respondents.

This suggests that dating app use has evolved to beyond basic user knowledge and users are opting for targeted GNDA that meet their motivations and needs. The distinction between age cohorts and country of birth is important and warrants further investigation; this can in turn influence targeted health promotion campaigns.

The most popular methods of discovery of dating apps in the sample population were word of mouth and social media. This study found that the frequency of dating app use was surrounding the few times per week to daily (up to 4 times), with a considerable proportion of the survey respondents had used dating apps in the past but not in the previous 12 months. This could be further explored in the context of problematic and/or addictive use and its links to social media platforms, which could substantiate and direct efforts to parallel ones on an international level.

Offline encounters were varied, with the most popular activity being, in descending order, sexual encounters, romantic relationships and meetings/dates being the most popular activities, in line with other bodies of work. The study findings also suggest that motivations behind dating app use for the sample population were diverse, ranging from entertainment to mindless passage of time to social, relational and romantic catalysts, despite the underlying narrative that tends to simplify GNDA use as being solely a means of organizing casual sex.

Most respondents indicated always feeling good when matching or when contacted multiple times, frequently feeling that GNDA had an impact on their self-esteem and self-worth, sometimes or rarely feeling that dating apps were a

positive experience overall and never feel that dating apps have taught them new sexual skills.

Respondents also strongly opposed the perception that personal data is collected by users, and had neutral predispositions towards perceptions of privacy, intimacy, and security issues. They agreed that they offer new horizons in meeting new people and strongly concurred with the fact that they can be used everywhere. This is another ancillary area which warrants exploration, in the context of data privacy and sharing being a priority at a national and European level.

The highest frequency of SAIs which the survey respondents were aware of was of HIV/AIDS, gonorrhoea, syphilis and chlamydia and lower awareness of HTLV, lymphogranuloma venereum and pinworms. The Malta-based sexual health services which were known the most by the survey respondents were GU clinic, breast screening, Richmond Foundation and Caritas, with the least-known being Servizz Għożża, CVSA and women and men's health physiotherapy. Being born in Malta was a significant predictor of knowledge of a number of sexual health services for the sample population. These findings are potential areas of priority, in that they indicate a possible area where inequities may thrive, particularly in residents who are foreign-born but are unaware of the services which are available to them, which may in turn impact healthcare access.

Two-thirds of respondents had partaken in sexual activities in the previous 12 months and one-third had not, with most of the former having had one sexual partner, followed by 2-5. Being in an exclusive relationship predisposed to having had sexual encounters. As expected, being single and not dating was associated with no sexual partners and having 2-5 partners in the previous two



months with casual dating.

As expected, casual dating has been significantly associated with having casual sex. Being in an exclusive relationship and being single and not actively dating was in turn associated with lack of multiple partners. Survey respondents aged between 25-34 years (that is, the most prevalent users of dating apps) have been found to have significant associations with having sexual relations while drunk).

Concerningly, having formal sexualities and relationships education in the sample population has been linked to having sex without contraception. Partially related to this is the association found between the male gender and having sex without a condom but with other forms of contraception. This could also be considered a priority area, by focusing future research to establish root causes and effective mitigation procedures.

Pregnancy considerations post-intercourse were very important in individuals who were in an exclusive relationship and those who are single and not actively dating. Moreover, the female survey respondents were also linked to placing high importance on considerations of cancer, local soreness or pain, emotional considerations, and urinary tract infections. Interestingly, when considering the sample population, being born in Malta was linked to perceptions that considerations of physical issues related to body image and self-esteem were deemed as not being important of a neutral nature.

When considering discovery methods and motives behind dating app use, social media was found to be significantly associated with connecting and meeting new people and singles of the same sexual orientation. Comparison of individual dating apps to perceived risks and benefits further corroborates the

link between Grindr and Scruff for sexual motives and expected outcomes.

There were similar themes which emerged from recommendations from respondents and the literature. Respondents suggested using banners or advertisements in health promotion campaigns which are timed or unskippable, containing information from reputable sexual health information sources, parallel to other multi-level general sexual health information campaigns. Some recommendations offered by the users also included recent and regular uploads of sexual health status by the users, potentially also as a requirement to use dating app.

In conclusion, the study managed to reach the aim and objectives set out by identifying the knowledge, attitudes, and practices of dating app users in the study population. The exploratory nature of the study has aided in the generation of a number of hypotheses of interest which can direct future research. More importantly, this information can act as a launching pad to the identification of the importance of dating app in the negotiation of relationships and sex in the digital era. This can in turn feed information into effective health promotion campaigns that target dating app users in an effective manner.

## 6.2 Recommendations

Recommendations following this study are limited by the exploratory nature of the dissertation, which has succeeded in generating multiple hypotheses, and the limited inferences that can be made from the study results. However, priority areas such as contraceptive use, sexualities and relationships education and ensuring equitable access to sexual health care in foreign-born residents can be considered.

### 6.2.1 Recommendations for Future Research

- Further local studies comparing dating app users and non-users in the form of cross-sectional surveys and ensuing calculations of prevalence.
- Further analysis of bettering recruitment processes in the context of dating app use with the aim of improving participation
- Further longitudinal studies, to be able to detect dynamic changes in dating app use, together with spatiotemporal studies.
- Further analyses on individual sub-populations or dating apps to be able to elucidate deeper outcomes.
- Further analysis on the increasing confluence between social media and dating apps.
- Further local studies assessing discrimination and antisocial behaviours during dating app use, as well as aggression, cyberbullying and sexual violence.
- More local research on the mental health implications of dating app use, including problematic dating app use.
- Qualitative or mixed method analyses to provide a contextual and layered analysis of local dating app use.

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## 8 Appendices:

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### Appendix A: Summary of Literature Review Findings

Study/Country	Sample (N, Characteristics)	Methodology	User Characteristics	Motivations	Usage Patterns	Sexual Behaviour	Perceived Risks and Benefits	Sexual Health Interventions
Ciocca et al., (2020) Italy	34 articles; Literature review of studies looking at Tinder use on human sexual behaviours	Literature Review	N/A	GNDA use not only motivated by sexual purposes. Also includes social, relational and romantic motives  Males more likely to make use of Tinder for sexual motives	N/A	Sociosexuality, substance and alcohol use are strong predictors of risky sexual behaviours in the context of GNDA. Further studies needed to determine if this is independent of the use of dating apps	Stigma and discrimination present in GNDA as in other digital arenas  Major concerns surrounding dating app use include privacy, safety and identity falsification	N/A
Wang et al., (2018) China	25 studies; meta-analysis looking at GBMSM using dating apps	Meta-analysis	Users mostly young adults (18-30 years); just over half being Caucasian, mostly identifying as gay and having at least college education (>70%)	N/A	N/A	Dating app use linked with unsafe sex and casual sexual partners and are more likely to have SAI diagnosis	N/A	N /A
Huang et al., (2016) Australia	137 applications; Search for free dating or sex applications and identification and characterization of sexual health content	Literature Review	N/A	N/A	N/A	N/A	N/A	15% of applications identified have sexual health information.  Mostly in four ways: disclosure by user of SAI status and safe sex preferences, pop-ups and links to sexual health sources
Zou & Fan, (2017) Australia	17 studies; Search for studies looking into GBMSM who use dating apps	Literature Review	App-using GBMSM are young, Caucasian of at least tertiary educational level, report high income	N/A	Almost half of GNDA users use multiple apps, accessing at least one daily and having used them	GNDA users have a higher prevalence of risky sexual behaviour with higher rates of SAIs but equal rates of HIV	N/A	Longitudinal studies on the behavioural changes due to interventions on dating apps to be

					for at least 12 months			determined, to determine the efficacy of app-based interventions
Queiroz et al., (2017) Brazil	14 studies; Search for studies looking at GBMSM dating app use and sexual behaviours	Literature Review	Young GBMSM more likely to be users of dating apps	Young users more likely to use GNDAs for sexual encounters, making friends and passing time	GBMSM familiar with GNDAs; high frequency of use reported – mostly in the afternoon and evenings during weekdays and on weekends	GNDAs users reported to have higher levels of recent and lifetime sexual encounters and higher numbers of sexual partners	Long-term dating app users found to have higher risk of developing depressive symptoms and issues with infidelity	Interventions and health education in the context of exponential growth of GNDAs use is fundamental
Obarska et al., (2020) Poland	59 articles; Analysis of the relationship between dating app use in GBMSM and mental health sequelae	Literature Review	Typical profile is that of a young GBMSM. Recent literature showcases increase in heterosexual users	Sexual encounters; social and romantic motives as well as community belonging	Excessive use related to unfavourable mental health sequelae	GNDAs use and risky sexual behaviour, particularly in the context of substance use (especially when sexualized) is inseparable	Comparison of dating app users versus non-users shows a higher prevalence of reduced sleep quality, depressive symptoms and life satisfaction and increased feelings of isolation	GNDAs may be used for mental health promotion and education
Castro & Barrada, (2020) Spain	70 studies; Analysis of articles relating to dating apps	Systematic Review	Dating apps used irrespective of sociodemographic characteristics.  Despite stereotype that dating apps are mostly used by GBMSM, heterosexual users have increased considerably	Sexual motivations are only one of many reasons for dating app use	Varied, but many suggest that a considerable proportion uses dating apps daily.  Type of offline relationship mostly sexual and platonic companionship	Dating app users do engage in riskier sexual behaviours but also partake in more preventative behaviours.  Results inconclusive, challenge initial stereotypes	GNDAs accessible, free, portable, non-intimidating and allow minority individuals to reach like-minded individuals.  Risk analysis is much more common in the literature. GNDAs may be related to issues with intimacy, privacy and security and leak of personal data and exposure to sexual victimization,	N/A

							negative psychosocial effects related to their use, and impact on self-esteem and body image.	
Luo et al., (2023) China	9280 GBMSM users of the dating app Blued. Divided into three groups: 1) HIV risk assessment tool and tailored feedback 2) HIV risk assessment tool with no feedback 3) government-recommended HIV material	Double Blind Randomized Controlled Trial	N/A	N/A	N/A	N/A	N/A	Repeated HIV risk assessments coupled with tailored feedback through dating apps improved HIV testing.
Albury et al., (2020) Australia	300 articles from subset of 6108 from Australia, USA and UK – combined to describe dominant themes and delineation of broad patterns at global level.  23 interviews with dating app users and non-users.	Mixed Methodology	N/A	N/A	N/A	N/A	N/A	Horizontal peer-to-peer information sharing can be very useful in the context of effective and meaningful health promotion strategies, particularly in the context of dating apps where sexual health activities may be hidden from the public health specialist.
Erevik et al., (2020) Norway	11,236 university students in large Norwegian	Online Survey	Tinder users mostly younger males, less likely to have children or have a religious belief compared to non-users.  Also reported more symptoms of anxiety	N/A	N/A	N/A	N/A	N/A

			and hazardous, harmful or dependent alcohol and substance use in the 6 months prior for both sexes.					
Marston et al., (2020) UK	Position paper aiming to explore the use of dating apps by older adults (50+ years) and young people with life-threatening or life-limiting positions (LLTCs)	Literature Review	There is a dearth of evidence on the experience of dating app users belonging to specific groups e.g., elderly users and LLTCs.	N/A	N/A	N/A	N/A	There have been multiple reports of private data leak, hacking of profiles from GNDAs and financial fraud. Moreover, reports of sexual discrimination, anti-social behaviour and body-image and self-esteem issues are also present. These may be more pertinent in certain subgroup of users.
Dhoest (2022) Belgium	Quantitative exploratory survey (online, anonymous) (n = 684) on perceived importance of online dating and in-depth (semi-structured) interviews to get an in-depth view on user experiences (n = 80) in GBMSM dating app users	Mixed Methodology	Despite the majority of GBMSM users being young, this paper looks at the heuristic value of a generational approach to dating app use.	Motivations may change depending on the digital landscape during sexual exploration as well as the life-stage and relational status individuals were in. Motivations are varied, not solely of a sexual nature	The preferred dating app of choice for respondents reflected those which the users had access to, with the younger individuals preferring more targeted GNDAs. All four groups used multiple dating apps for various reasons.	N/A	N/A	N/A
Liew et al., (2023) Malaysia	Non-probability purposive sample in dating app users over 18 years of age (n = 300) shared on social media.	Online Cross-sectional Survey	N/A	Continuous use intention of Malaysian dating app users was significantly related to habit, social	N/A	N/A	N/A	N/A

				influence and price value.				
Lamont (2021) USA	Literature review of the persistence of the stereotypical nature of a heterosexual relationship with the man leading and the woman following	Literature Review	The presence of women on GNDAs suggests that women are taking a more active role in the initial aspects of the relationship.	The Bumble app was designed to solely allow females to initiate conversations, allowing women to have a leading role.	N/A	N/A	N/A	N/A
Bonilla-Zorita et al., (2021) UK	43 articles, Focusing on dating apps and problematic behaviour	Systematic Literature Review	N/A	Motives for GNDAs use are multiple and include sex-searching, self-esteem enhancement	N/A	GNDAs have been associated with increase in unprotected intercourse and risky sexual behaviours.  Significant difference in condom use found between users and non-users.	Dating apps associated with perceived risk of deceit, harassment and financial fraud, as well as objectification of self and others.  Social media addiction has been described; due to similar user interfaces of GNDAs, similar associations can be made.	N/A
Hermosa-Bosano et al., (2021a) Ecuador	303 GBMSM participants who are Ecuadorian residents.  Online survey used is the Tinder Motives Scale (TMS)	Cross-sectional Online Survey	High income associated with more favourable GNDAs outcomes.	Most common uses for GNDAs use were distraction, connection with individuals of a similar sexual orientation and having sexual encounters.  However, GNDAs found to serve both sexual and non-sexual purposes.	Participants reported using between 1-9 apps (average of 3), up to 3 hours per day.  The most popular app was Grindr, followed by Tinder. Instagram and Facebook were also used.	N/A	GNDAs offer positive outcomes for GBMSM, allowing for community formation and increased sensation of well-being.  Perceived risks include discrimination and excessive body image concerns	N/A
Hermosa-Bosano et al., (2021b) Ecuador	284 GBMSM dating app users who are Ecuadorian residents.	Cross-Sectional Online Survey	N/A	N/A	Grindr was GNDAs most popular platform for meeting sex-	Positive correlations have been made between increased age and single status to HIV testing.	The relative anonymity of dating apps allows for expression of	GNDAs may be used to create profiles for disclosure of HIV

	Online survey looked at sociodemographic details, sexual behaviours and HIV and STI prevention strategies				partners, followed by Tinder-like app and social media platforms		sexual interests through privacy of one's own device.	and SAI status. However, being dependent on user consent, this may be limited due to the associated stigma.  It can also be used to link information to sexual health information or services.
Choi et al., (2021) Hong Kong	31 semi-structured interviews targeting HIV-negative GBMSM individuals who use dating apps residents in Hong Kong	Qualitative	Most common age range is young users	Use of dating apps in search for sexual encounters is common.  GNDA use is still stigmatized and users sometimes given the stereotypical label of being promiscuous. Dating app use hidden in some instances or limited in view of this.	Quality of encounters predictive of future hook-ups and how individual will continue with app usage	Availability and types of meeting venues influenced whether the match for sex would take place.  Strong correlation found with condom use; less so with trust and use of PrEP Individuals less prone to communicate preferences for safer sex.  Chemsex users view themselves as being in control of their use of drugs.  Distress regarding HIV infection appeared to outweigh concerns about other SAIs; trust in PrEP is limited.	Risks for sexual violence present, less recognized in GBMSM. Protective mechanisms rarely in place.  Power dynamics between novel and more experienced GNDA user, leading to instances of sexual coercion.  Positive implications of GNDA also recognized; facilitation of social connections instantly and privately and fulfilment of personal goals.	Need to target younger users on risk-reduction interventions and safer sex.
Garga et al. (2021a) Australia	Convenience sampling (n = 852) 18-30 years of age Taken from individuals visiting permanent health promotion stand	Cross-sectional survey	N/A	N/A	Tinder was the most popular app followed by Bumble. A third of users used apps >2 years, another	Dating app users noted a change in their behaviour after app use with increase in sexual activity, number of	N/A	Sexual health information can be disseminated during popular festival and events when dating app



	within ground during 3-day festival				third between 1-2 years.  Half of the users had not met sexual partners via dating apps; 30% had met half of them via GNDAs	sexual partners and experimentation.  SAI status discussion was not frequent (irrespective of app use).  Increased sexual contacts in individuals who had used dating app >2 years		use will occur. It can also target the demographic which has used GNDAs the longest.
Garga et al., (2021b) Australia	Convenience sampling (n = 862) of individuals attending three-day music festival on demographics, sexual behaviour, risk perception and GNDA use.	Cross-sectional survey	Users more likely to be single and GBMSM.	N/A	N/A	Music festival attendees who engage in casual sex, do not discuss safe sex, have multiple partners, have unprotected sex with intravenous drug users, or with someone who has an SAI are more likely to use GNDAs	Perceived risk of having unprotected sexual intercourse, sex while drunk and the risk of having multiple sexual partners as being present were more likely to be using dating apps.  Increased perception of risk does not always translate to safer sexual behaviours.	A high proportion of the participants agree that GNDAs should promote safe sex.
Barrada et al., (2021) Spain	902 university students asked to complete multiple questionnaires to analyse demographics, dating app use, sociosexual tendencies and long-term mating prospects	Online Survey	N/A	Despite the stereotypical assumptions behind dating app use, motives are diverse and complex.  Easier to find people who are unrestricted in their sexuality, but no difference between users and non-users in their wish to maintain long-term romantic relationships. Flexibility in mating orientations present.	N/A	N/A	N/A	N/A

Tran et al., (2019) USA	1769 adults, filled in questionnaire assessing dating app use and unhealthy weight control behaviours	Online Survey	N/A	N/A	N/A	GNDAs are considered to be contributors to body dissatisfaction due to the image and appearance-centred culture of dating apps.  Dating apps have been linked to unhealthy weight control behaviours, higher in racial minorities. No link was found to sexual	N/A	N/A
Orosz et al., (2018) Hungary	(n = 414) Hungarian residents 18-43 years answered online questionnaire followed by a focus group of 17 Tinder users.  Study also looks into personality traits and relationship between self-esteem and problematic Tinder use	Mixed Methods	N/A	N/A	N/A	N/A	Self-esteem enhancement, sex and love motives were linked to problematic Tinder use (in decreasing magnitude).  Boredom not related to problematic GNDAs use.	N/A
Boonchutima & Kongchan, (2017) Thailand	(n = 350) GBMSM individuals recruited via convenience sampling distributing among specific online GBMSM communities	Online Questionnaire	N/A	N/A	N/A	Dating apps are used increasingly by Thai GBMSM to seek sexual encounters. Approximately half of users received continued invitations for substance use. This contributes to the rapidly spreading AIDS in the region.  Dating app use increases the risk of substance abuse through persuasive behaviours	N/A	N/A
Gatter & Hodkinson, (2017) Austria	Participants (n = 75) were recruited over social media and completed questionnaires	Online questionnaire	Dating app users younger than online dating users or non-users.	Males more likely to use both online dating and dating apps for casual sex partners.	N/A	N/A	N/A	N/A

	assessing motivation to use online dating, sociability, self-esteem, and sexual permissiveness.		There are no inherent differences between dating app, online dating users and non-users	Dating app users also found to be more sexually permissive.				
Bonilla-Zorita et al., (2023) UK	Smartphone app created to collect real-time data on wellbeing measures and objective measures of use (n = 22) during a 1-week period	Quantitative	N/A	N/A	N/A	N/A	No significant effect found between time spent on dating apps on mood and self-esteem.  Higher dating app use time created higher levels of craving. No link between number of notifications and craving found and were associated with positive outcomes.	N/A
Sawyer et al., (2018) USA	509 heterosexual cisgender undergraduate students aged 18–25 completed an online survey assessing trait impulsivity, dating app use and motivations for using dating apps, sexual behavior, and demographics	Online Survey	N/A	Individuals in a relationship more likely to have multiple sexual partners and partake in risky sexual behaviour	N/A	GNDAs users had higher rates of sexual risk behaviours in the previous 3 months, including sex under the influence of alcohol or drugs and more lifetime sexual partners.	Young adults who use dating apps may be an appropriate target for sexual health interventions	N/A
Bineau et al., (2021) USA	Online survey (n = 85) and follow-up qualitative phone interviews with 20 survey respondents assessing dating app use, sexual behaviours, PrEP awareness and usage and associated attitudes in rural USA.	Mixed Methodology	N/A	Motivations include interest in seeking partnerships or meaningful relationships, as opposed to just 'hooking up'.  Some apps are more popular in terms of seeking sexual encounters.	N/A	Dating app users had more sexual partners than non-users but also have higher interest and more positive attitudes in using PrEP	GNDAs beneficial for making connections and creating a sense of community.  Provide space for establishing mutual interests or understanding of intention prior to meeting up	Dating apps can be beneficial in disseminating health information to GBMSM in rural USA.  Targeting apps which are more popular with individuals seeking sexual

								encounter may be beneficial. This is particularly useful in individuals living in rural areas in view of their limitations to education and care.
Liberacka-Dwojak et al., (2023) Poland	Assessment and validation of the Problematic Tinder Use Scale (PTUS) in Polish and to explore the relationship between PTUS and Safe Sex Behaviour Questionnaire (SSBQ) (n = 271, 162)	Online Survey	GNDAs users have completed at least secondary level of education	Majority of respondents used Tinder to seek a romantic partner.	Individuals who use Tinder everyday and met more partners in real life were more prone to problematic Tinder use.  Majority of respondents use the standard, free version.  Most claimed to use Tinder a few times a week.	Tinder use linked to riskier sexual behaviours	Uncontrollable use of dating apps is related to higher risk of engaging in risky sexual behaviours.  No link between sociodemographic factors and problematic GNDAs use.	Dating apps can potentially act as appropriate platforms for sexual health interventions.
Tomaszewska & Schuster; (2020) Germany	(n = 491) individuals comprising of college students and community participants completed online survey on use of dating apps, risky sexual scripts, risky sexual behaviour, self-esteem and assertiveness.	Online Survey	N/A	N/A	There is a variety in usage, from approximately one-fifth using GNDAs once a year or less and similar numbers using them 3-4 times per week and daily.  Most women had met their counterpart offline, the vast majority 1-10 times.	No differences found for sexual self-esteem, casual sex and drinking alcohol in sexual situations.  GNDAs users report more casual sexual behaviour, and higher readiness to engage in sexual contacts early in the meeting of a new person, validating the function of dating apps as 'hook-up' apps.  No difference between users and non-users in	Young men who are dating app users reported lower sexual self-esteem and had implications on initiation of sexual contact and more condoning attitudes towards sexual coercion.	Increasing media literacy, with particular focus on male identification as sexual beings and the role of casual sex in relation to unwanted sex could be explored in sex education programmes.

						terms of alcohol and communication.		
Choi et al., (2016) China	(n = 666) individuals answered questionnaire on dating app use, sexual behaviours and sociodemographics in university campuses in Hong Kong	Questionnaire	N/A	N/A	N/A	GNDAs use was associated with an increased number of sexual partners, unprotected sexual intercourse and increased likelihood of having inconsistent condom use and low likelihood of having used condom during last sexual encounter.	N/A	Users of dating apps should be targeted in risk assessments, screening and risk stratification.  Educational elements to promote safe sex should be incorporated in apps.
Castro et al., (2020) Spain	(n = 1705) university students who were asked to complete several online questionnaires looking into their sociodemographic characteristics and personality features.	Online Survey	The male gender, single relationship status, being part of a sexual minority and older youths is associated with a higher likelihood of being a previous or current user of GNDAs.  Men more likely to use dating apps. Older youths more likely to have used or currently use them.  4% of individuals using dating apps found to be in a relationship	N/A	N/A	N/A	N/A	Popularity of dating apps can be used to promote sexual health among diverse and at-risk populations.
Blake et al., (2022) Australia	(n = 690). Participants asked to complete online questionnaire about demographics, lifetime dating app use, frequency and motivations. It also included queries on	Online Survey	N/A	Thrill of excitement, trendiness and ease of communication the commonest motivations of GNDAs use, casual sex being the least popular.	N/A	N/A	Disordered eating correlated with the female gender, higher BMI, history of an eating disorder, appearance-based rejection	N/A

	social rank, fear of negative evaluation, emotion dysregulation and disordered eating.						<p>sensitivity and emotion dysregulation.</p> <p>Small positive association between GNDAs use and disordered eating, indicating that GNDAs users more likely to report such symptoms.</p> <p>Using GNDAs for ease of communication or validation of self-worth was related to disordered eating.</p>	
Tavares et al., (2020) Brazil	Convenience sample of college students (n = 359) and answered questionnaire focusing on sociodemographics, dating app use, sexual behaviours and attitudes.	Questionnaire	N/A	N/A	N/A	<p>Frequency of casual encounters and number of sexual partners higher in males and higher in GNDAs users.</p> <p>Unsafe sex mostly reported by young adults and those reporting casual sexual encounters. Both sexes reported similar rates of condom use, which was low.</p> <p>Two most considerable risky behaviours include repeat encounters and trusting one's sexual partner and not using condoms.</p> <p>No gender differences with respect to testing.</p>	N/A	<p>Women did not receive sexual health information through dating app.</p> <p>Safe sexual health information on dating apps can be an intervention method to reduce risky sexual behaviour.</p>

						Healthy sexual practice was higher in females but was not a predictor of safe sex		
Ren et al., (2021) China	Convenience sampling targeting Chinese university students from four campuses, targeting sexually active individuals (n = 901) in the previous 6 months.  Participants assessed on factors predisposing to risky sexual behaviours.	Online Survey	N/A	N/A	N/A	Dating app use is associated with multiple sexual partners among college students.  Those with multiple partners likely to be young males.  Authors speculate that gender norms may play a role.	N/A	Preventative messages and notifications should be incorporated into apps to promote safe sex practices and the negotiation of safe sex, particularly in target groups
Dai, (2023) USA	Participants (n = 680) were 18–35-year-olds belonging to undergraduate research pools at two universities.  GNDA users asked on potential moderators of risky sexual behaviour	Quantitative Survey	N/A	Sociosexuality, sexual compulsivity and sexual sensation seeking were consistently the strongest moderators to positive relationships between GNDA use and risky sexual behaviours	Average amount spent on GNDA was 55.62 mins daily.	More frequent GNDA use was associated with having more sex partners, more casual sex, and having unprotected sex at least once, particularly in males.  Not associated with having an SAI, potentially due to underreporting or undertesting.  Older adults engaged in less risky behaviours	N/A	Intervention messages for GNDA users should be visually appealing; content should focus on harm reduction approaches by accentuating the importance of proper protection and SAI testing.  Self-learning algorithms could more precisely identify and predict psychological predispositions through natural language processing.
Jennings & Kypridemos (2019) UK	Official Public Health England SAI incidence data.	Ecological Study	N/A	N/A	N/A	Positive association found between SAI incidence and GNDA usage.	N/A	N/A

	This was linked to a proxy measure of GNDA usage by using Google Trends internet search data.					Age was not a predictor. Being part of a racial minority was.		
Knox et al., (2021) China	A sample (n = 1311) of GBMSM were recruited online and asked to describe characteristics of recent sexual encounters.	Online Survey	N/A	N/A	N/A	Individuals were more likely to have unprotected anal sex in partnerships they initiated offline compared with partnerships they initiated online.	N/A	N/A
Holloway et al., (2014) USA	(n = 195) GBMSM participants asked about patterns of and motivations for Grindr use and willingness to participate in smartphone app-based HIV prevention programmes in the future.	Online Survey	N/A	Motivations for using Grindr included but were not limited to finding sex partner.  Grindr played a different role than other GBMSM dating sites, mainly to pass the time, make new connections and maintain friendships.	GBMSM who use Grindr also use a variety of other technologies, including other apps.	N/A	It is crucial for public health professionals to consider how these technologies may be used to promote health and wellbeing among GBMSM.	Majority of participants sought sexual health information online.  Vast majority (80%) of participants indicated they would be willing to participate in HIV prevention delivered online or via smartphone apps.  Developing strategies that are attractive, engaging, informative and culturally relevant are imperative
Barrada & Castro (2020) Spain	Participants (n = 1261) students from Spanish university completed online questionnaire on motives, sociodemographic, psychological and	Online Survey	N/A	Two main motivations were curiosity and passing time/entertainment and to socialize.	Usage data lower than other studies, including frequency of use and number of offline meetings	Tinder users found to be more likely to have sociosexual attitudes and likelihood to consensual non-monogamy.	No difference found between Tinder users and non-users in mood, self-esteem as a sexual partner and body satisfaction.	N/A



	psychosexual characteristics			Men were not found to have higher sexual motivations than females.  Tinder is another tool used by young people to interact with other people.  Demystification of the negative connotations of dating apps.	following initial GNDAs contact.		Tinder users rated higher in sexual preoccupation and dissatisfaction with sex life, Directionality cannot be determined.  No apparent negative connotations or loss of emotional well-being.	
Power et al., (2022) Australia	Participants (n= 445) were asked to fill a survey on perceptions of risk and benefits	Online survey	LGBTIQ+ individuals more likely to have used dating apps and met someone online, sent sexualized images to another person.	Seeking casual partners via dating apps or websites not uncommon.	N/A	N/A	Dating apps may provide a way for newly arrived or temporary migrants to engage in social or dating cultures in the 'new' country.  More than a third agreed that connecting with someone online helped them achieve a greater sense of sexual or emotional intimacy	More than half of the participants stated that information found on the internet helped them feel more comfortable with sex and allowed them to explore sexual cultures to which they had no previous access.  LGBTIQ+ more likely to have sought sexual health information online.
Mateizer & Avram, (2022) Romania	Participants (n = 244) asked on sociodemographic parameters, motives for app use, online sexual activities, attachment orientations and sexual self-concept and satisfaction.	Online Survey	N/A	People's perceptions of themselves as sexual beings plays an important role in determining why and how they engage in online dating.	N/A	N/A	No evidence of problematic online sexual activities found.	N/A

Chadwick et al., (2023) USA	GBMSM participants (n = 60) with diverse ethnicity and HIV status asked about use of GNDAs for sexual purposes, discussions of HIV disclosure and condom use behaviours	Qualitative (Semi-structured interviews)	N/A	N/A	N/A	<p>HIV status disclosure was noted to be done on occasion depending on the level of commitment to partner or only when asked.</p> <p>Other forms included active disclosure (on profiles) or leaving blank status.</p> <p>Others may not disclose or discuss HIV status when using condoms</p>	N/A	<p>Active HIV disclosure status on one's profile may not always be effective. GNDAs users may overlook profile or mix-up information. Blank statuses may be interpreted in different ways.</p> <p>Warnings issues that a blank HIV statement does not necessarily equate to positive or negative status. Partners may not have read what is posted on a profile.</p> <p>Pre-written messages in GNDAs asking about HIV status – aimed to normalize such conversations.</p>
Goedel et al., (2023) USA	Individual in-depth interviews (n = 30) and focus groups (n=18) and asked about current exposure to marketing contact on apps, preferences for format of health promotion campaign and its content.	Qualitative	N/A	N/A	N/A	N/A	N/A	<p>Banner advertisements preferred to pop-up ones, as well as direct messages delivered to their inbox.</p> <p>Mixed feedback on sexually explicit media.</p> <p>Preference to social media campaign which provides</p>

								information and directs them to trusted clinic to an online booking system and receive confirmation online
Jenkins Hall et al., (2017) USA	<p>Health professional set up a dating app profile logging in during set times. He did not target users but only responded after an app user contacted him (n = 673).</p> <p>Based on inquiries, health educator compiled informative, user-friendly responses to questions about HIV and SAI and testing and provided reputable resources about various sexual health topics based on user need and priorities.</p>	Qualitative	N/A	N/A	N/A	N/A	N/A	<p>The intervention through targeted automated messages moves beyond information transfer and seeks to change behaviour through individualized HIV prevention and education messaging.</p> <p>Automated interventions may not be as effective as having a real health educator (targets of bots and fake identities) – users felt comfortable reaching out.</p> <p>There is a need for app interventions to be tailored to specific needs of individuals within the community, comprehensive and inclusive.</p>
Patten et al., (2020) Canada	Research question looks into how GBMSM use GNDA to facilitate and/or engage	Literature Review	N/A	N/A	N/A	Dating apps can provide a supplemental and convenient platform through which	N/A	Despite having dating apps which do not allow certain words,

	in sexualized drug use (n = 35)					individuals who are already active ‘chemsex’ participants can look for sexual partners.		users started using emojis and modifications of words to refer to chemsex parties.
Goedel & Duncan (2015) USA	GBMSM participants (n = 92) recruited via Grindr. Respondents asked about motives and usage patterns of GNDAs.	Online Survey	Mean age was 31.73 years, majority was Caucasian and were mostly gay (77.2%) or bisexual (21.7%). More than half had completed tertiary education and nearly 75% were employed on a full-time or part-time basis.	The commonest motivations were to ‘kill time’ when bored, followed by making friends with other men, seeking romantic partnerships and to go on dates.  Individuals in partnerships less likely to use GNDAs for romantic purposes but more likely to use them to engage in sexual encounters.	Average age at which respondents began to use apps was 26.61 years for 4.83 years.  Most active in the evening or late nights or on weekends.  On average GNDAs accessed 8.38 times daily and spent 1.31 hours and sent 21.03 messages  Majority also had accounts on multiple apps.	A high propensity to seek out novel or risky sexual stimulation was positively associated with the number of partners an individual met on apps and had intercourse with.  No significant difference was found between GBMSM who seek partners	N/A	Understanding when users are most active can aid in targeted interventions.  GBMSM spend significant time on these apps daily. For these reasons, HIV prevention interventions could be delivered though a wide range of apps with potentially large reach to a high-risk subset of MSM.
Hoenigl et al., (2020) USA	Adults GBMSM and transgender women (n = 1256) seeking community-based HIV and SAI screening were surveyed on demographics, substance, use, Grindr usage, risky sexual behaviour and PrEP use	Quantitative Survey	N/A	N/A	High screen-time associated with higher likelihood of risky sexual behaviours.	Grindr users were more likely than non-users to be taking PrEP, but 80% were not taking it at the time of testing.  Users also more likely to initiate PrEP after testing encounter.  Grinder users more likely to be diagnosed with SAI and to have taken PrEP two weeks prior to testing encounter – therefore less likely to test positive for HIV.	N/A	Grindr may prove a real opportunity to reach those at risk and substantially increase PrEP awareness and uptake.  A more personalized delivery of prevention messages, such as on profile pictures of certain opinion leaders may be more effective.

Portingale et al., (2022) Australia	<p>Women (n = 296) completed a baseline survey assessing lifetime app usage, partner preferences and rejection sensitivity.</p> <p>This was then followed by an ecological investigation of momentary practices or experiences of body dissatisfaction and disordered eating.</p>	Quantitative Study	N/A	N/A	N/A	N/A	<p>Women who used GNDA's at least once in their lifetimes tended to report greater daily urges for binge eating and purging and associated negative mood compared to non-users.</p> <p>No difference found in body dissatisfaction and dietary restraint.</p> <p>No association found between disordered eating and partner preferences</p>	Education programmes targeting the education of young females on the potential detrimental consequences of GNDA use on eating behaviour and emotional wellbeing may be of importance.
Katz (2023) UK	Grindr tourism practices were analysed using 19 in-depth interviews and six audio diaries in Tel Aviv.	Qualitative	N/A	<p>Motivations during travel may range from a simple restaurant recommendation to an in-person date with a tour of the city.</p> <p>Grindr offers the potential for numerous interactional outcomes negotiated between users.</p>	N/A	N/A	<p>Tourism changes are potentially occurring due to the availability of dating apps.</p> <p>Grindr may be used as part of travel experience.</p>	N/A

## Appendix B: Tinder Motives Scale

Final Items, 7-Point Likert Scale (1) Strongly Disagree, (7) Strongly Agree, "I use Tinder ..."

TMS Factor	Items ( <i>N</i> = 58)	
Social Approval	To get an "ego-boost". To get self-validation from others. To see how desirable I am.	To get compliments. To be able to better estimate my own attractiveness. To get attention.
Relationship Seeking	To find someone for a serious relationship. To fall in love. To meet a future husband or wife.	To build an emotional connection with someone. To seek out someone to date.
Sexual Experience	To find a friend-with-benefits/fuckbuddy. To find a one-night-stand. To see how easy it is to find a sex partner.	To increase my sexual experience. To live out a sexual fantasy. To find a lover/mistress.
Flirting/Social Skills	To learn to flirt. To improve my social skills. To increase my flirting experience. To gain more self-confidence in my social skills.	Because it is hard to talk to people in real life. Because it is a more enjoyable to make the first move.
Travelling	To get tips from locals (in restaurants, shopping, party, ...) when travelling. To meet other travelers/locals when in a foreign country. To learn about hotspots in foreign countries through locals. To easily find people that are willing to party when in a foreign country. To broaden my social network when on an abroad/exchange experience.	
Ex	To get over my ex. To think less about my ex.	So that I do not focus my attention on my ex anymore.
Belongingness	Because I want to be trendy. To be cool.	Because it is a fad. Because everyone uses Tinder.
Peer Pressure	Because my friends thought I should use Tinder. As suggested by friends. Because someone else made me a Tinder profile.	
Socializing	To make new friends. To broaden my social network.	To meet new people. To talk to people I don't know personally.
Sexual Orientation	To connect with other people with the same sexual orientation. To get to know people with the same sexual orientation. To meet singles with a similar sexual orientation.	
Pass Time/Entertainment	To pass time. Because it passes time when I'm bored. To occupy my time. When I have nothing better to do.	For fun. Because it is entertaining. To relax.
Distraction	As a break at work or during a study period. To procrastinate things I should be doing (working, studying, ...). To combat boredom when working or studying.	
Curiosity	To see what the application is about. Out of curiosity. To try it out.	

(Taken from Timmermans & De Caluwé, 2017b)

## Appendix C: Original Questionnaire used by Garga et al.

### Q.1. Age

### Q.2. Gender

- Male
- Female
- Other

### Q.3. Sexual orientation

- Heterosexual
- Homosexual
- Bisexual
- Asexual
- Pansexual
- Other, please specify

### Q.4. Relationship status

- Single and not dating
- Casual dating
- In an open relationship
- In an exclusive relationship
- Other, please specify

### Q.5. Have you engaged in sexual activity in the last 12 months?

- Yes, continue to question 6
- No, continue to question 9

### Q.6. How many partners have you had sex with in the past 12 months?

- 1
- 2-5
- 5-10
- 10-15
- 15-30





Having multiple sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having unprotected sex with a partner who has ever injected drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having sex with a partner who has an STI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Please fill out the last column even if you have not engaged in these activities in the last 12 months*

Q.9. Have you used a dating app in the last 12 months?

Yes, continue to question 11

No, continue to question 10

(Taken from Garga et al., 2021b)

## Appendix D: Permission to Use Questionnaire

From: **Charmaine Cordina** <charmaine.cordina.06@um.edu.mt>  
 Subject: Re: Request for Permission to Use Questionnaire  
 Date: 28 November 2022 10:48  
 To: **Sabrina Pitt** <sabrina.pitt@sydney.edu.au>



Thank you very much for your reply Dr Pitt, truly humbled. I shall keep you abreast of any interesting outcomes.

Kind Regards,

Charmaine

On 27 Nov 2022, at 09:16, Sabrina Pitt <sabrina.pitt@sydney.edu.au> wrote:

I would be honoured if you use it, also happy to co-publish if of interest. Sabrina Pitt

<https://theconversation.com/floods-and-other-emergencies-can-be-extra-tough-for-people-with-disabilities-and-their-careers-182006>

Dr Sabrina Pitt (Work | Health | Ageing)  
 Honorary Senior Research Fellow THE UNIVERSITY OF SYDNEY  
 Adjunct Research Fellow WESTERN SYDNEY UNIVERSITY  
**University Centre for Rural Health**  
 A collaboration between THE UNIVERSITY OF SYDNEY | WESTERN SYDNEY UNIVERSITY | UNIVERSITY OF WOLLONGONG |  
 SOUTHERN CROSS UNIVERSITY | with NSW Local Health District |  
 61 Oxley St Lismore | NSW | 2480  
 M +61 4 2945 5720 E [sabrina.pitt@sydney.edu.au](mailto:sabrina.pitt@sydney.edu.au) W <http://work.edu.au>

**Chair – Standards Australia National Committee SB027 Ageing Activities**  
 Standards News <https://www.standards.org.au/updates/standards-forces/standards-issues/issue-18/safe-ageing>

Wismann AK, Pitt SW, Scuderi P, Gebhardt H Strategic Guidance and Technological Solutions for Human Resource Management in Sustainable Aging Workforce: Review of International Standards, Research, and Use Cases IABR Human Factors 2022 8:1-212K <https://doi.org/10.1002/9781119527228.ch12>

Pitt S, Fook et al (2022) COVID-19 and the ageing workforce: global perspectives on needs and solutions across 31 countries. *International Journal for Equity in Health* <https://doi.org/10.1186/s12914-021-01532-4>

Pitt, M., Livingstone, A., Pitt, S.W. (2020) Telehealth in the Context of COVID-19: Changing Perspectives in Australia, the United Kingdom, and the United States. *Journal of Medical Internet Research* 2020 8(9). <https://www.jmir.org/2020/9/e13764/>

From: Charmaine Cordina <[charmaine.cordina.06@um.edu.mt](mailto:charmaine.cordina.06@um.edu.mt)>  
 Sent: Thursday, November 24, 2022 3:52 PM  
 To: Sabrina Pitt <[sabrina.pitt@sydney.edu.au](mailto:sabrina.pitt@sydney.edu.au)>  
 Subject: Request for Permission to Use Questionnaire

Good evening,

I am a medical doctor currently reading a Masters in Public Health with the University of Malta. I am currently preparing for my dissertation where I am planning to look at dating app use and associated sexual knowledge, attitudes and practices in the Maltese population from a Public Health lens. I came across the questionnaire used in a cross-sectional study in a medical journal (DOI: 10.2196/21062), which would be perfect to use for my research question. Could I please ask for permission to use it?

Many thanks for your time and kind consideration. Please pardon any inconvenience caused.

Kind Regards,

Charmaine

# Kwestjonarju fuq *Geosocial Dating Apps*: Studju Esploratorju

Jien Dr. Charmaine Cordina, tabiba u studenta fl-Università ta' Malta, nsegwi l-kors Master tax-Xjenza fis-Saħħa Pubblika. Ir-riċerka għat-teżi tiegħi jisimha: ***Geosocial Networking Dating Apps: An Exploratory Study on the Knowledge, Attitudes and Practices of the Maltese Population***; it-tutor tiegħi hija Dr. Joanne Farrugia. Hawn taħt ser issib aktar informazzjoni fuq l-istudju il qed nagħmel u fuq x'ikun l-involvement tiegħek jekk tiddeciedi il tipparteċipa. L-għan tat-teżi hu il jinkiseb għarfien dwar l-użu tad-*dating apps* f'Malta u l-għarfien, attitudnijiet u prattici assoċjati magħhom.

## Is-Sehem Tiegħek:

L-informazzjoni kollha migbura f'din ir-riċerka se tintuża biss għall-fini ta' dan l-istudju.

Jekk tagħzel il tipparteċipa, tintalab timla kwestjonarju onlajn t'hawn taħt li se jieħu madwar għaxar minuti. Dan għandu l-għan li jevalwa diversi aspetti tas-saħħa sesswali kif tirrelata mad-*dating apps*. Għalkemm ċertu mistoqsijiet huma ta' natura personali, m'għandhomx l-għan il jinvestigawk jew jidentifikawk personalment bl-ebda mod.

L-informazzjoni mogħtija se tingabar bl-użu tal-mili tal-kwestjonarju li inti ġejt mitlub/a tirrispondi, u pprocessat b'softwer biex jiġu generati statistiċi mir-risposti.

Il-partecipazzjoni f'dan l-istudju hija għal kollox volontarja; fi kliem ieħor, inti liberu/a li taċċetta jew tirrifjuta li tieħu sehem, u li twaqqaf il-partecipazzjoni fl-istudju meta tixtieq, mingħajr ma tagħti spjegazzjoni u mingħajr ebda riperkussjoni.

Jekk tagħzel il tipparteċipa, m'hemm l-ebda benefiċċju dirett għalik, però tkun qed tgħin fil-kollezzjoni ta' informazzjoni dwar is-sitwazzjoni kurrenti assoċjata ma' l-użu ta' l-apps tad-dating f'Malta.

Il-partecipazzjoni tiegħek ma fiha l-ebda riskju magħruf jew mistenni. Se tiġi mitlub/a tikkonferma li għandek iktar minn 18-il sena biex tipparteċipa.

## L-Immaniġġjar tal-Infommazzjoni:

L-informazzjoni generata se tkun anonimizzata. Din se tiġi mizmuma fuq komputer personali aċċessat b'*password*. Id-data se tiġi *backed-up* fuq l-*iCloud*, li ukoll se ikun jista jiġi aċċessat b'*password*. *Multi-factor authentication* se tiġi uzata f'stadi varji. L-informazzjoni se tiġi aċċessata biss mir-riċerkatriċi u tuturi.

Bħala partecipant/a, skont ir-Regolament Ġenerali dwar il-Protezzjoni tad-Data (GDPR) u

L-leġiżlazzjoni nazzjonali li timplimenta u tispeċifika aktar id-dispożizzjonijiet rilevanti ta' l-imsemmi regolament, għandek dritt il taċċessa, tikkoreġi u, fejn hu applikabbli, titlob l-informazzjoni kkonċernata miegħek titfassar. L-informazzjoni kollha miġbura se titfassar wara li jiġu ppublikati ir-riżultati.

Inti mfakkar/mfakkra il fl-ebda mument m'hu ser tintalab tipprovdi ismek jew kwalunkwe data personali oħra li tista' twassal biex tkun identifikat/a.

Jekk tixtieq tipparteċipa f'dan l-istudju, jekk jogħġbok agħfas fuq il-buttuna addattata. Jekk le, ipproċedi li tagħlaq l-*browser* tiegħek.

Jekk għandek xi mistoqsijiet jew tħassib tista tikkuntattja lili jew lit-tutor tiegħi fuq id-dettalji provduti.

*Genitourinary (GU) Clinic: 25457454/2545749*

*Psychological Support Service: Mental Health Helpline ( 24/7): 1579*

*Għal aktar informazzjoni fuq is-saħħa sesswali jekk jogħġbok żur is-sit:*

<https://sexualhealth.gov.mt>

Grazzi.

Dr. Charmaine Cordina (Riċerkatriċi)

[charmaine.cordina.06@um.edu.mt](mailto:charmaine.cordina.06@um.edu.mt)

\* Required

Dr. Joanne Farrugia (Supervisor)

[joanne.farrugia.2@gov.mt](mailto:joanne.farrugia.2@gov.mt)

## Konferma ta' Partecipazzjoni

### 1. Jekk jogħġbok ikkonferma l-età tiegħek (18+) \*

- Nikkonferma li jiena adult (18+) u nagħti l-kunsens tiegħi. Nixtieq inkompli bit-tħarrig.
- Le, ma nixtieqx nipparteċipa.

## Informazzjoni Ġenerali

### 2. Età \*

18 - 24

25 - 34

35 - 44

45 - 50

50+

### 3. Ġeneru \*

Maskil

Femminil

Ieħor

### 4. Orjentazzjoni Sesswali \*

Eterosesswali

Omosesswali

Bisesswali

Ieħor, jekk jogħġbok speċifika hawn taħt

5. Orjentazzjoni sesswali (jekk mhux indikata fil-mistoqsija ta' qabel)

6. Livell t'Edukazzjoni \*

- Primarju
- Sekondarju
- Terzjarju
- Post-Graduate*

7. Pajjiż tat-twelid \*

Select your answer



8. Stat Konjugali: \*

- Xebba jew ġuvni, mhux qed tmur *dates*
- Dating* każwali
- Relazzjoni *open*
- Relazzjoni esklussiva (fissa)
- Ieħor, jekk jogħġbok specifika hawn taħt

9. Stat Konjugali (Jekk mhux indikat fil-mistoqsija ta' qabel):

10. Qatt kellek edukazzjoni fuq is-sesswalitajiet u r-relazzjonijiet? \*

- Iva - formali (skola, knisja, istituzzjonijiet)
- Iva - informali (ġenituri, ħbieb)
- Le
- Ieħor, jekk jogħġbok specifika hawn taħt

11. Forom oħra ta' edukazzjoni sesswali (jekk mhux indikati fil-mistoqsija ta' qabel):

## Użu ta' *Dating App/s*

12. Qatt iżajt *dating app/s* fil-passat? \*

Iva

Le

13. Liem *dating app/s* iżajt fl-aħħar 12-il xahar? Immarka kemm japplikaw: \*

Immarka kemm japplikaw.

Tinder

Bumble

Eharmony

OkCupid

Badoo

Grindr

Humper

Scruff

Ieħor, jekk jogħġbok specifika hawn taħt



14. Innota *dating app/s* oħra li tuża (jekk mhux indikati fil-mistoqsija ta' qabel):

15. Kif smajt bid-*dating app/s* li tuża? \*

Immarka kemm japplikaw.

- Bil-kliem
- Media Soċjali
- Reklami
- Blog posts* jew artikli
- Ieħor, jekk jogħġbok specifika hawn taħt

16. Innota sorsi oħra ta' kif smajt bid-*dating app/s* li tuża (jekk mhux indikati fil-mistoqsija ta' qabel):

17. Kemm-il darba taċċessa d-*dating app/s*? \*

- Iktar minn 10 darbiet kuljum
- Bejn 5-9 darbiet kuljum
- Bejn 1-4 darbiet kuljum
- Ftit drabi fil-ġimgħa
- Darba fil-ġimgħa
- Fil-*weekends*
- Diversi drabi fix-xahar
- Darba fix-xahar
- Darba kull ftit xhur
- Kull sena
- Ieħor, jekk jogħġbok specifika hawn taħt

18. Innota kemm-il darba taċċessa d-*dating app/s* (jekk mhux indikat fil-mistoqsija ta' qabel)

19. Kemm-il darba kien hemm żvilupp minn użu ta' *dating app/s* għal dawn li ġejjin? \*

	Qatt	Rarament	Xi drabi	Fr
Laqgħat ( <i>Dates</i> )	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Attività sesswali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Relazzjoni Romantika	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ħbiberija	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ieħor, jekk jogħġbok speċifika hawn taħt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

20. oħra li ħargu minn-użu ta' *dating app/s* (jekk mhux indikati fil-mistoqsija ta' qabel)

Innota kemm japplikaw. Jekk jogħġbok indika ukoll il-frekwenza.

21. Kemm minn dawn li jmiss jimmotivaw l-użu tiegħek tad-*dating apps* \*

	Ma naqbilx hafna	Ma naqbilx	Xi ftit ma naqbilx	Newtrali	Naqbel xi
Approvazzjoni soċjali (validazzjoni)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex infittex relazzjoni	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Għal esperjenzi sesswali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex intejjeb il- <i>flirting</i> /hilet soċjali tiegħi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex nużah meta nsiefer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex ninsa l- <i>ex</i> sieħeb/sieħba	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Għax kulhadd juża dating apps (appartenenza)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Peer pressure</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex niltaqa' ma' nies u nagħmel ħbieb ġodda (nissoċjalizza)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex niltaqa' ma' persuni u nies single bl-istess orjentazzjoni sesswali tiegħi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biex ngħaddi l-ħin/divertiment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bħala  
*break mix-*  
xogħol/skola  
22. (distrazzjoni) joni tiegħek dwar il-kummenti li ġejjin? \*

Għall-kurzità

Ma naqbilx ħafna

Ma naqbilx

Newtrali

*Dating apps*  
għandhom  
impatt fuq kif  
nara lil ġismi  
(body image)

*Dating*  
*apps* għandhom  
impatt fuq is-  
self esteem u l-  
valur tiegħi

Nikkumpara lili  
nnifsi ma' nies  
oħra li jużaw  
*dating apps*

L-użu ta' *dating*  
*apps* kienet  
waħda ġeneral-  
ment pożittiva

L-użu ta' *dating*  
*apps*  
għallmitni ħiliet  
sesswali godda

L-użu ta' *dating*  
*apps* għallmitni  
ħiliet goddamet  
a niġi  
rrifjutat/a jew  
*ghosted*

Inħossni  
tajjeb/tajba bja  
nnifsi meta  
nimmeċċja  
(*matching*) jew  
niġi  
kkuntattjat/a di  
versi drabi

23. X'inhi l-perċezzjoni tiegħek dwar il-kummenti li ġejjin? \*

*Dating apps:*

	Ma naqbilx ħafna	Ma naqbilx	Newtrali
Joffru orizzonti godda ta' kif persuna tiltaqa' ma' nies godda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jistgħu jiġu aċċessati minn persuni b'livelli ta' ħiliet differenti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mhumieq intimidanti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Huma aċċessibbli faċilment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Huma b'xejn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jirrekjedu inqas ħin u sforz minn modi tradizzjonali ta' komunikazzjoni	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jistgħu jiġu użati kullimkien	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Huma utli biex tikkonnettja ma' nies oħra li qegħdin ġeogra fikament viċin minn dating app/s	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joffru element ta' kontroll ma' min tagħzel li tikkomunika	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Huma mgħammra bil-mizuri ta'			

## aħħa Sesswa

S	sigurtà meħtieġa biex jipproteġu lill- klijenti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	tagħhom			
	Għandhom impatt fuq l- intimità tiegħi (emozzjonalme nt u biex tibbondja)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Għandhom impatt fuq il- privatezza tiegħi (kemm fuq livell personali u tar- relazzjoni/jiet tiegħi)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Huma superficcjali u jiffokaw biss fuq id-dehra fiżika	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Ninstab inkwetat li nista' nkun lokalizzat u indentifikat faċilment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Ninstab inkwetat li d- data personali tiegħi tista tingabar minn nies oħra	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Ninstab inkwetat li d- data personali tiegħi tingabar minn softwer ta' l-app	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Liem minn dawn il-mard li jista' jigi trazzmess sesswalment inti konxju tagħhom? \*

25. Innota infezzjonijiet oħra li jistgħu jigu trazzmessi sesswalment li taf bihom (jekk mhux indikati fil-mistoqsija ta' qabel).

—

*Herpes*

HIV/AIDS

*Human Papillomavirus (HPV)*

*Syphilis*

*Trichomoniasis*

*Monkeypox*

*Pubic (crab) lice*

*Scabies (Skabbja)*

Zika

*Lymphogranuloma venereum*

*Chancroid*

*Granuloma genitalium*

*Mycoplasma genitalium*

Infezzjoni ġenitali mhux speċifika (infezzjoni ta' l-għonq ta' l-utru, infezzjoni tal-pajp ta' l-awrina)

*HTLV (Human T-Cell Lymphotropic Virus Type 1)*

*Shigella*



27. Indika servizzi/għaqdiet ta' sapport relatati ma' saħħa sesswali oħra li taf bihom (jekk mhux indikati fil-mistoqsja ta' qabel).

28. Hadt sehem f'attività sesswali fl-aħħar 12-il xahar? \*

Iva

Le

29. Kemm-il *partner* sesswali kellek fl-aħħar 12-il xahar? \*

1

2-5

6-10

11-15

16-30

31-50

Aktar minn 50

*Victim Support Agency*

*Women's and Men's Health Physiotherapy*

Ieħor, jekk jogħġbok specifika hawn taħt

30. Ippartecipajt f'xi attività imsemmija hawn taħt fl-aħħar 12-il xahar?

\*

Immarka kemm japplikaw

- Sess każwali
- Sess taħt l-influenza ta' l-alkoħol
- Sess ma' *partner/s* li għandom infezzjoni li tista' tiġi trażmessa sesswalment
- Sess ma' *partners* sesswali multipli
- Sess bla-kontraċettiv
- Sess bla kondom imma b'forom oħra ta' kontraċettiv e.g. il-pill
- Sess ma' *partner/s* li kienu jew għadhom jinġettaw sustanzi illeċiti (droga)
- Diskussjoni fuq stat t'infezzjonijiet u kunfini sesswali qabel partecipazzjoni f'attività sesswali

31. Kemm taħseb li saħħtek tkun f'riskju meta tipparteċipa fl-attivitajiet imniżżlin? \*

	L-ebda riskju	Riskju minimu	Riskju moderat	kon
Sess każwali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sess taħt l-influenza ta' l-alkoħol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sess ma' <i>partners</i> li għandom infezzjoni li tista' tiġi trażmessa sesswalment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sess ma' <i>partners</i> sesswali multipli	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sess bla-kontraċettiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sess bla kondom imma b'forom oħra ta' kontraċettiv e.g. il-pill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sess ma' <i>partners</i> li kienu jew għadhom jinġettaw sustanzi illeċiti (droga)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Diskussjoni fuq stat t'infezzjonijiet u kunfini sesswali qabel partecipazzjoni f'attivit� sesswali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

32. Liem tip ta kontraċettiv tuża b'mod regolari? \*

Immarka kemm japplikaw.

- L-ebda forma
- Pulling out (withdrawal) method*
- Family planning naturali*
- Kondoms
- Spermicidi
- Pillola Kontraċettiva ("il-pill")
- Intra-uterine device ('copper coil')*
- Intra-uterine system ('Mirena, Jaydess')
- Ċirku vaġinali ('Nuva Ring')
- Diaphragm*
- Implant kontraċettiv (taħt il-ġilda)
- Inġezzjoni bil-kontraċettiv (inġezzjoni fil-muskolu)
- Morning after pill ('EllaOne, Levonelle')*
- Oral dam*
- Ieħor, jekk jogħġbok specifika hawn taħt

33. Innota forom oħra ta' kontraċettiv li tuża b'mod regolari (jekk mhux indikat fil-mistoqsija ta' qabel)

34. Tuża *pre-exposure prophylaxis* (PReP) u/jew *post-exposure prophylaxis* (PEP) b'mod regolari? \*

- Iva, nuża kemm PReP u PEP b'mod regolari
- Iva, nuża PReP b'mod regolari
- Iva, nuża PEP b'mod regolari
- Le, ma nużax PReP u PEP b'mod regolari

35. Jekk tuża *pre-exposure prophylaxis* (PReP) u/jew *post-exposure prophylaxis* (PEP), x'inhuma ċ-ċirkostanzi meta użajhom?

36. Kif tikkunsidra dawn l-fatturi ta' hawn taht wara li jkollok sess? \*

	Mhux importanti	Inqas importanti	Newtrali	Im
Tqala	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Tnaqqis ta' fertilita' jew infertilita'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
HIV/AIDS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Mard ieħor trasmess sesswalment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Kankru	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ugiegh waqt is-sess	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Infezzjonijiet tal-awrina	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Fatturi emozzjonali (konnessjoni emozzjonali, intimita' mal-partner sesswali)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

37. Fatturi fiżiċi oħra (*self-esteem*, tħassib fuq id-dehra fiżika) ħra li tikkunsidra wara li tipparteċipa f'attivitajiet nhux indikati fil-mistoqsija ta' qabel)

I ta' importanza.

Ieħor, jekk jogħġbok speċifika hawn taht

38. Għandek xi suggerimenti fuq kif *dating apps* jistgħu ikunu aktar siguri minn lenti ta' saħħa sesswali?

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## Appendix F: Finalized Questionnaire in English

# Geosocial Dating Apps Questionnaire: An Exploratory Study

My name is Dr. Charmaine Cordina, a medical doctor and postgraduate student at the University of Malta reading for a Master of Science in Public Health. I am presently conducting research as part of my dissertation titled **Geosocial Networking Dating Apps: An Exploratory Study on the Knowledge, Attitudes and Practices of the Maltese Population**, supervised by Dr. Joanne Farrugia. The aim of my study is to gain insight into the usage of dating apps in Malta and Gozo, and associated knowledge, attitudes and practices.

### **Your Participation:**

Any data collected from this research will be used solely for the purposes of this study.

Should you choose to participate, you will be asked to fill in the following online questionnaire. This will take around ten minutes. It is aimed at assessing various aspects of sexual health as it relates to dating apps. Whereas some of the questions are of a personal nature, they are not seeking to investigate you personally or identify you in any way.

Data will be collected through use of the completed questionnaire you have been asked to fill in and processed using appropriate software to generate associated statistics on answers.

Participation in this study is entirely voluntary; in other words, you are free to accept or refuse to participate, without needing to give a reason. You are also free to withdraw from the study at any time, without needing to provide any explanation and without any negative repercussions for you.

If you choose to participate, please note that there are no direct benefits to you; however, you would be contributing to the generation of information about the current situation associated with the use of dating apps in the Maltese islands.

Your participation does not entail any known or anticipated risks. You need to confirm you are above 18 years of age to participate.

### **Data Management:**

The data generated will be anonymized. It will be stored in a personal password-protected computer and will be backed up on iCloud, which will also be password-protected. Multi-factor authentication will be used at various stages. The information will only be accessed by the researcher and tutors.

As a participant, you have the right under the General Data Protection Regulation (GDP) and national legislation that implements and further specifies the relevant provisions of said regulation to obtain access to, rectify and where applicable ask for data concerning them to be erased. All data collected will be erased following publication of results.

You are reminded that at no point will you be asked to provide your name or any other personal data that may lead to you being identified.

If you wish to participate in this study, please click on the appropriate button. If not, please proceed to close your browser window.

Should you have any questions or concerns, you may contact my supervisor or myself on the details provided below.

*Genitourinary (GU) Clinic: 25457454/2545749*

*Psychological Support Service: Mental Health Helpline (available 24/7): 1579*

*For more information on sexual health kindly visit: <https://sexualhealth.gov.mt>*

Thank you.

Dr. Charmaine Cordina (Researcher)  
[charmaine.cordina.06@um.edu.mt](mailto:charmaine.cordina.06@um.edu.mt)

Dr. Joanne Farrugia (Supervisor)  
[joanne.farrugia.2@gov.mt](mailto:joanne.farrugia.2@gov.mt)



\* Required

## Confirmation of Participation

1. Please confirm your age (18+). \*

- I confirm that I am an adult (18+) and give my consent and wish to continue with the survey
- No, I would not like to participate

### General Information

2. Age: \*

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 50
- 50+

3. Gender \*

- Male
- Female
- Other

4. Sexual Orientation \*

- Heterosexual
- Homosexual
- Bisexual
- Other, please specify below

5. Sexual orientation (if not indicated above)

6. Educational Attainment \*

- Primary
- Secondary
- Tertiary
- Post-Graduate



7. Country of Birth \*

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda
- Argentina
- Armenia
- Australia
- Austria
- Azerbaijan
- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bhutan
- Bolivia
- Bosnia and Herzegovina
- Botswana
- Brazil
- Brunei
- Bulgaria
- Burkina Faso
- Burundi
- Cote d'Ivoire



- Cambodia
- Cameroon
- Canada
- Central African Republic
- Chad
- Chile
- China
- Colombia
- Comoros
- Congo (Congo Brazzaville)
- Costa Rica
- Croatia
- Cuba
- Cyprus
- Czechia (Czech Republic)
- Democratic Republic of the Congo
- Denmark
- Djibouti
- Dominica
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Equatorial Guinea
- Eritrea
- Estonia
- Eswatini (former 'Swaziland')
- Ethiopia
- Fiji

Finland

France

Gabon

- Gambia
- Georgia
- Germany
- Ghana
- Greece
- Grenada
- Guatemala
- Guinea
- Guinea-Bissau
- Guyana
- Haiti
- Holy See (Vatican City)
- Honduras
- Hungary
- Iceland
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Israel
- Italy
- Jamaica
- Japan
- Jordan
- Kazakhstan
- Kenya
- Kiribati
- Kuwait



Kyrgyzstan

Laos

- Latvia
- Lebanon
- Lesotho
- Liberia
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- Madagascar
- Malawi
- Malaysia
- Maldives
- Mali
- Malta
- Marshall Islands
- Mauritania
- Mauritius
- Mexico
- Micronesia
- Moldova
- Monaco
- Mongolia
- Montenegro
- Morocco
- Mozambique
- Myanmar (formerly Burma)
- Namibia
- Nauru
- Nepal

Netherlands

New Zealand

- Nicaragua
- Niger
- Nigeria
- North Korea
- North Macedonia
- Norway
- Oman
- Pakistan
- Palau
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russia
- Rwanda
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and the Grenadines
- Samoa
- San Marino
- São Tomé and Príncipe
- Saudi Arabia
- Senegal
- Serbia

Seychelles

Sierra Leone

Singapore

- Slovakia
- Slovenia
- Solomon Islands
- Somalia
- South Africa
- South Korea
- South Sudan
- Spain
- Sri Lanka
- Sudan
- Suriname
- Sweden
- Switzerland
- Syria
- Tajikistan
- Tanzania
- Thailand
- Timor-Leste
- Togo
- Tonga
- Trinidad and Tobago
- Tunisia
- Turkey
- Turkmenistan
- Tuvalu
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom

United States of America

Uruguay

- Uzbekistan
- Vanuatu
- Venezuela
- Vietnam
- Yemen
- Zambia
- Zimbabwe

8. Relationship Status: \*

- Single and not dating
- Casual dating
- Open relationship
- Exclusive relationship
- Other, please specify below

9. Relationship status (if not indicated above)

10. Did you have sexualities and relationships education? \*

- Yes - formal (school, church, institutions)
- Yes - informal (parents/guardians, peers)
- No
- Other, please specify below

11. Other forms of Sexual Education (if not indicated above)



## Dating App Use

12. Have you used dating app/s in the past? \*

Yes

No

13. Which dating app/s have you used in the last 12 months? \*

Tick as many that apply

Tinder

Bumble

Eharmony

OkCupid

Badoo

Grindr

Humper

Scruff

Other, please specify below

14. List any other dating app/s you use (if not indicated above).

15. How did you find out about the dating app/s you use? \*

Tick as many that apply.

Word of mouth

Social media

Advertisements

Blog posts or articles

Other, please specify below

16. List other sources of how you found out about the dating app/s you currently use (if not indicated above)

17. How frequently do you access dating app/s \*

- More than 10 times a day
- Between 5-9 times a day
- Between 1-4 times a day
- Few times per week
- Weekly
- On weekends
- Multiple times per month
- Monthly
- Once every couple of months
- Yearly
- Other, please specify below

18. Please indicate how often you access dating app/s (if not indicated above).

19. How many times has dating app use led to the offline development of the following? \*

	Never	Rarely	Sometimes	Frequently	Always
Meeting/s (Dates)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Romantic relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify below	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Kindly indicate other offline developments from the use of dating apps (not indicated above)

List as many that apply. Kindly also indicate frequency of occurrence.

21. How much do the following motivate your dating app use? \*

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
Social Approval	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To seek a relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For sexual experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To improve flirting/social skills (it's harder to talk to people offline)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use when travelling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get over an ex-partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To have a sense of belonging (everyone uses dating apps)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To meet new people and make new friends (socialising)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To connect and meet new people and singles of the same sexual orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To pass time (entertainment)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distraction (as a break from work/study)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Curiosity (to see what it is about)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. What is your perception of the following statements? \*

Dating apps:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Dating apps have an impact on my body image	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dating apps have an impact on my self-esteem and self-worth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I compare myself to other dating app users	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using dating apps has been a positive experience overall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using dating apps has taught me new sexual skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using dating apps has taught me skills when dealing feelings of rejection, when 'ghosted'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good about myself when I match or am contacted multiple times	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix G: FREC Ethical Approval



**L-Università  
ta' Malta**

**Faculty of  
Medicine & Surgery**

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[www.um.edu.mt/ms](http://www.um.edu.mt/ms)

Ref No: MED-2022-00421

20 March 2023

Dr Charmaine Cordina



With reference to your application submitted to the Faculty Research Ethics Committee in connection with your research entitled:

**Geosocial Networking Dating Apps: An Exploratory Study on the Knowledge, Attitudes and Practices of the Maltese Population.**

The Faculty Research Ethics Committee is granting ethical approval for the above-mentioned application.

A handwritten signature in blue ink, appearing to read 'A. Serracino Inglott'.

Professor Anthony Serracino Inglott  
Chair  
Faculty Research Ethics Committee