Article

Wellbeing and (Mental) Health: A Quantitative Exploration of Portuguese Young Adults' Uses of M-Apps from a Gender Perspective

Eduardo Antunes [1,*], Rita Alcaire [2] and Inês Amaral [1,3]

1   Faculty of Arts and Humanities, University of Coimbra, 3004-530 Coimbra, Portugal
2   Centre for Social Studies, University of Coimbra, 3000-995 Coimbra, Portugal
3   Communication and Society Research Centre, University of Minho, 4710-057 Braga, Portugal
*   Correspondence: eduardo.antunes@fl.uc.pt

Abstract: Acknowledging the importance of technology in the mental health and wellbeing of individuals during the COVID-19 pandemic, this paper aims to analyse the uses of mobile health applications by young Portuguese adults focusing on the following research question: How do the uses of m-apps by young adults interact with health and wellbeing from a gender perspective? An online survey was conducted to a representative sample of young Portuguese adults (18–30 years), under the objectives of the MyGender project that studies the interconnections of young adults with m-apps, with their technicity and imaginaries. The approach followed in this paper is quantitative-extensive. Results reveal low usage of overall health and wellbeing apps, particularly among single respondents who do not have children. Health and self-tracking apps are among the 10 most frequently used apps. Only 6.20% of the sample considers mental health apps (mHapps) as one of the three most important types of apps. Having children is a factor for a bigger interconnectedness of the respondents with overall health and wellbeing apps and the general quality of care.

Keywords: knowledge management; mental health; mobile apps; digital technology; mhealth; gender

1. Introduction

'Mental health' and 'wellbeing' have become popular expressions in the public sphere. Mental health has become a matter of public interest for various reasons, such as the increasing appeal of the concept of wellbeing or a fascination for the complexity of the human experience. In recent years, mental health has been a priority area on government and research agendas, which seldom contrasts with the lived experience of populations and the lack of access to mental health care.

There is a tendency to look at mental health as an individual attribute, according to an orientation that prioritises proximal psychological factors and ignores or devalues the importance of other social and structural aspects (Quartilho 2020). Nevertheless, mental health should be faced as a public health matter, not only because of its importance for physical health and quality of life of populations but also because of the growing prevalence of mental disorders at a global level, with evident social and economic costs and this cannot be solved with strategies or interventions focused only on the individual. According to the WHO (2022), the concept of quality of life corresponds to the individual's perception of their position in the context of the culture and value system in which they live concerning their goals, expectations, standards, and personal concerns. Therefore, the idea of positive mental health appears to be closely associated with this concept, implying not only the satisfaction of basic and social needs but also the autonomy to enjoy life and participate actively as citizens, in a society where there is civic integration, social cohesion, interpersonal trust and other integrative norms, including justice and equity, in a physically and socially sustainable global environment.

Media and overall digital technologies have become an important resource for individuals, health services delivery, and public health: they are intelligent, personalised and improved as they glean data from their users. Evidence shows that an increasing proportion of the population is accessing health information and services through smartphones, and a vast array of mobile solutions, from SMS to complex mobile applications, have been developed to improve health access, knowledge and behaviour across a range of contexts and target groups (WHO 2022).

By assuming the importance of technology in individuals' mental health and wellbeing of individuals during the COVID-19 pandemic (Lemenager et al. 2021), this paper aims to analyse the uses of mobile health and wellbeing mobile apps by young Portuguese adults. Therefore, this paper aims to answer the following research question: How do the uses of m-apps by young adults interact with health and wellbeing, from a gender perspective? To put it forward, an online survey was conducted on a representative sample of young Portuguese adults (18–30 years).

The article draws from a gender perspective, examining how mobile-based technologies mediate mind-body duality, considering self-tracking and self-quantifying movements as well as the myriad of mental health apps and their uses and implications. The subsequent sections present a literature review, the quantitative-focused empirical study (which uses both descriptive and inferential statistical procedures), and a discussion of results and conclusions.

2. Literature Review

With the profusion of mobile phones, their mobility, ease of access to a myriad of apps, and the possibility of direct communication, mHealth has never been more widespread, surging unparalleled during the COVID-19 pandemic (Tarricone et al. 2021). In that respect, many interactive and psychoeducational apps are readily available to download concerning a wide range of health issues (Rathbone and Prescott 2017; Palos-Sanchez et al. 2021). Smartphone wellbeing apps help people manage and monitor their exercise, diet, and stress levels. Other types of apps repackage medical information already found online and offer information about symptoms and treatments. Others provide the possibility to book consultations with doctors. There is a growing range of apps through which users can talk directly to doctors and therapists. With potentially more far-reaching effects on the quality of care, there is an emerging breed of apps that monitor and diagnose patients with a variety of ailments, in some cases predicting and thus helping to avert health crises. Overall, research has shown that mHealth is increasingly being used for patient communication, monitoring, and education; to reduce the burden of diseases linked with poverty; to improve access to health services, clinical diagnosis, and treatment adherence; and for chronic disease management (Gurman et al. 2012; Nglazi et al. 2013; Devi et al. 2015; Agarwal et al. 2021). Empirical data also provided solid evidence of the effectiveness of physical and mental health interventions using mobile apps (Watts et al. 2013), including during the COVID-19 pandemic, when both physical and mental health was further compromised (Oliveira et al. 2021).

A growing body of scholarship on digital surveillance has been concerned with the impact of mobile apps, namely considering power relations, inequalities, and commodification by promoting voluntary records of individual quantitative data (van Dijck 2014; Lupton 2016a). In addition, critical research on digital surveillance technologies is concerned with datafication being a form of colonising the life-world (Gilbert 2018; Couldry and Mejias 2019) as it enables the transformation of individual and social behaviours into quantified data (Ruckenstein and Pantzar 2017). Mobile-based technologies mediate screen time (Lohmeier et al. 2020) and promote the digitisation of self-tracking (Lupton 2016b), which facilitates the quantifying of everyday life as they monitor, measure, and record behaviours, individual habits, or human body elements (Lupton 2016b).

The self-quantified movement promotes self-experimentation to generate data on overcoming a mind-body duality through tracking (Ruckenstein and Pantzar 2017). Self-

track and self-quantifying applications intertwine the idea of 'digital wellbeing' and are often presented as wellbeing tools. These apps monitor, measure, and record physical exercise, birth control, fertility, menstruation, and sexual intercourse. Likewise, these technologies promote individualisation but are also described as intrusive technology and digital surveillance (Gillespie 2014; van Dijck 2014; Mollen and Dhaenens 2018).

Data-driven technologies mediate time (Lohmeier et al. 2020) and promote the digitisation of self-tracking (Lupton 2016a), which facilitates the quantification of everyday life. Self-track and self-quantify apps intertwined with digital wellness tools by aiming for 'digital wellbeing.' Likewise, these technologies promote individualisation and self-responsibilisation, addressing the 'digital detox' metaphor.

'Digital wellbeing' concerns the psychological and social influence of digital technologies. As an interdisciplinary concept, it can be defined as "the impact that digital technologies, such as social media, smartphones, and AI, have had on our wellbeing and our self-understanding of what it means to live a life that is good for us in an increasingly digital society" (Burr and Floridi 2020, p. 3).

Digital wellbeing technologies motivate users towards individual and socially valuable behaviours (Sullivan and Reiner 2019), here promoting an orientation shift from 'being good' to 'feeling good' (Baker and Rojek 2020). In addition, digital wellbeing products aim to optimise digital health that arises as a response to 'technostress' (Lee et al. 2016).

Self-quantifying and self-tracking experiences enabled by m-apps may be defined within the logic of flow (Lomborg et al. 2018), which refers to the concept of temporality. These new time-space configurations promoted by smartphones and portable devices merged personal and professional life, dissolving the concept of time, and promoting "limitless accessibility and manic connectivity" (Agger 2011, p. 123). As the labour process has become increasingly mobile, time is now a commodity in postcapitalism (Agger 2011). Life on the screen blurs the boundaries between professional and personal spheres, transforming labour into "self-reproducing" (Agger 2011, p. 121). Agger describes this instant and permanent connectivity as "iTime". The author defines it as a "way of co-opting, coordinating and commodifying human activity, enmeshing people in what Foucault called the microphysics of power, a grid that binds them to an everyday life lived thoughtlessly" (Agger 2011, p. 122).

Several studies show that young adults use self-tracking apps for health monitoring (Kanstrup et al. 2018), tracking physical activity (O'Loughlin et al. 2021), weight management and dieting (Abril 2016). Regarding self-quantifying apps, studies report use for fitness (Fotopoulou and O'Riordan 2017), wellness tools (Buchs et al. 2020) and mental health (Marzano et al. 2015); track sexual encounters (Danaher et al. 2018); scrutinise menstrual periods (Kressbach 2021); measure fertility issues (Gambier-Ross et al. 2018; Hamper 2020); and record pregnancy and parenting related topics (Lupton and Pedersen 2016).

As "socio-cultural constructs of temporality" (Kaun and Stiernstedt 2014, p. 1156), digital technology affordances may enhance communicative practices (Bucher and Helmond 2017) through temporality dimensions: archive, flow, and narrative (Kaun and Stiernstedt 2014). Moreover, these notions shed light on temporal layers of structuration of time, forging "connections between individual and social time" (Kaun and Stiernstedt 2014, p. 1158) in digital platforms. From the 'swipe-up' practice, dating apps forge time, discarding people's knowledge, and emphasising a hook-up culture (Albury et al. 2017). In addition, m-apps increasingly extend to sexual, intimate, and loving relationships (Light 2014), promoting romantic and sexual partner-seeking practices (Albury et al. 2017), reinforcing heteronormative masculine and feminine roles (Albright and Carter 2019; Comunello et al. 2020).

The number of mHealth apps focused on mental health (mHapps) has also rapidly increased. In 2015, a World Health Organization survey of 15.000 mHealth apps revealed that 29% focus on mental health diagnosis, treatment, or support (Anthes 2016). This heightened popularity and the functionality of mHapps have several implications for the delivery of mental health services, namely the potential to increase access to evidence-based

care; better inform consumers of care and more actively engage them in treatment; increase the use of evidence-based practices, and enhance care after formal treatment has concluded (Price et al. 2014).

MHapps target a wide range of issues and vary in both design and functionality. The National Institute of Mental Health (NIMH) in the United States of America classifies mental health apps into six categories based on their functionality: self-management, cognition improvement, skills-training, social support, symptom tracking, and passive data collection (National Institute of Mental Health 2017). Mental health apps extend over all stages of clinical care provision, including immediate crisis intervention, prevention, diagnosis, primary treatment, supplement to in-person therapy, and post-treatment condition management (Chandrashekar 2018; Price et al. 2014), having the potential to improve people's lives in a general manner (Schomakers et al. 2022). Mobile apps are considered a good choice for psychological treatment delivery compared to other platforms. If partnered with the Internet and social media, they present opportunities to enhance disease prevention and management by extending health interventions beyond the reach of traditional care. Chandrashekar (2018) set out to understand whether and which mental health apps have proved effective and argues that mHealth apps are valuable in providing psychological treatment.

Existing data shows that mobile apps and other technology-based solutions play an essential part in the future of evidence-based mental health care (Simon and Ludman 2009; Amit et al. 2019) and represent privileged opportunities to expand the availability of mental health treatment (Bakker et al. 2016; Kenny et al. 2016). Namely, by making support geographically, socially, and financially more accessible and reducing personal barriers that might be in place towards seeking care.

Understanding patterns of real-world usage of mental health apps is key to maximising their potential to increase care self-management. Other studies emphasise a tendency for users of health-related technology-based solutions or mHealth apps being women, highly educated (Wang et al. 2021) and younger (Bol et al. 2018; Schomakers et al. 2022). This empirical study conceptualises mental health apps as part of a broader health and wellbeing app category. Thus, allowing a better perception of the interconnectedness of overall health and wellbeing issues with mobile apps to the Portuguese young adult population.

3. Materials and Methods

The approach followed in this paper is a quantitative-extensive methodological strategy—an online survey—done in the scope of the MyGender project. 'MyGender—Mediated young adults' practices: advancing gender justice in and across mobile apps' is the first-ever study in Portugal aimed to investigate how young adults engage with the technicity and imaginaries of mobile applications, incorporating them into their daily lives, embodying them in their everyday practices, and (re)negotiating from it their gender and sexual identities. Challenging research focused either on the risks and opportunities or on the uses and gratifications of digital practices, MyGender assumes an understanding of technology as producing meaning, subjectivity, and agency shaped by power relations. Adopting a critical perspective of contemporary digital media, the project is analysing mobile app affordances, grammars, platform politics, and content, as well as their uses, appropriations, and embodiment, to understand how they are shaping hegemonic normativity and changing young adulthood lives.

The COVID-19 pandemic situation reinforced the importance of the focus on health and wellbeing. In that sense, an emphasis on such contemporary problematic and corresponding patterns and contexts of usage is evident.

An online questionnaire was constructed and then conducted in October of 2021—during the COVID-19 pandemic—to a representative sample of Portuguese young adults (N = 1500) with ages ranging from 18 to 30 years old, regarding quotas of gender and region (which includes Mainland Portugal and islands). 49.8% of the respondents are between 18 and 24 years old, while 50.2% are between 25 and 30. The results were analysed with the

statistical program IBM SPSS, using both descriptive and inferential (bivariate) statistical analysis. The sample distribution can be consulted in Table 1.

Table 1. Sample distribution.

	Count N	Count %
Age		
18–24	747	49.80%
25–30	753	50.20%
Gender Identity		
Man	696	46.40%
Woman	796	53.07%
Non-binary	14	0.93%
Rather not answer	1	0.07%
Sexual Orientation		
Heterosexual	1253	83.5%
Graysexual	1	0.1%
Lesbian	29	1.9%
Gay	35	2.3%
Bisexual	128	8.5%
Pansexual	27	1.8%
Queer	11	0.7%
Asexual	12	0.8%
Demisexual	4	0.3%
Rather not answer	46	3.1%
Marital Status		
Single	1145	76.33%
Married or in Non-marital partnership	349	23.27%
Divorced or Separated	6	0.40%
Widowed	0	0.00%
Other	0	0.00%
Do you have children?		
Yes	247	16.5%
No	1253	83.5%
Education		
Basic education	48	3.20%
High school	655	43.67%
Bachelor's degree	516	34.40%
Master's degree	260	17.33%
PhD	21	1.40%
Occupation		
Student	425	28.33%
Self-employed	130	8.67%
Employee	759	50.60%
Liberal worker (Freelancer)	36	2.40%
Unemployed	150	10.00%

Source: Authors.

Tables 1 and 2 present descriptive results of such a representative sample. Tables 3 and 4 display data from inferential statistical analysis, which compares proportions through z-testes with a significance level of 0.05. Table 5 also presents descriptive results, while Table 6 presents data from such mentioned inferential statistical analysis procedures to compare proportions. In the case of Tables 3, 4 and 6, for each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion, thus representing a statistical significance.

Table 2. Types of apps and corresponding percentages of highly frequent usages.

Type OF App	%
Social Media	95.6%
Health	**36.5%**
Mindfulness/Meditation	**18.7%**
Fitness	**27.0%**
Mental Health	**19.1%**
Nutrition	**19.1%**
Self-tracking	**33.3%**
Dating	12.7%
Email	88.9%
Messaging apps/Videoconference	83.5%
Map/Navigation	48.9%
Home banking/Finances	60.7%
Productivity	32.3%
News	48.9%
Shopping	39.9%
Entertainment/Gaming	60.8%
Transportation/Travelling	27.9%
Utilities	41.5%
Other	31.2%

Source: Authors.

Table 3. Health and wellbeing apps mean perception of usage (1–5).

	Gender		Marital Status		Do You Have Children	
	Man (A)	Woman (B)	Single (C)	Married or in Non-Marital Partnership (D)	Yes (E)	No (F)
Type of app						
Health	3.05	2.98	3.08 D	2.79	2.75	3.07 E
Mindfulness/Meditation	3.81	3.84	3.85	3.76	3.49	3.90 E
Fitness	3.38	3.53	3.49	3.38	3.32	3.49
Mental Health	3.76	3.83	3.81	3.76	3.51	3.86 E
Nutrition	3.70	3.81	3.80	3.65	3.40	3.84 E
Self-tracking	3.59 B	3.07	3.36 D	3.13	3.17	3.34

Source: Authors.

Table 4. Mean level of importance of health and wellbeing apps to Portuguese young adults (1–5).

	Gender		Marital Status		Do You Have Children	
	Man (A)	Woman (B)	Single (C)	Married or in Non-Marital Partnership (D)	Yes (E)	No (F)
Type of app						
Health	3.12	3.27	3.19	3.22	3.32	3.17
Mindfulness/Meditation	2.76	2.82	2.78	2.84	2.97 F	2.76
Fitness	2.97	2.99	2.97	3.01	3.06	2.96
Mental Health	2.99	3.04	3.00	3.05	3.20 F	2.98
Nutrition	2.93	2.94	2.91	2.99	3.13 F	2.89
Self-tracking	2.92	3.16 A	3.04	3.07	3.11	3.03

Source: Authors.

Table 5. Ranking of the three most used types of apps (%).

	Most Used Types of Apps			
	1st	2nd	3rd	Total
Type of app				
Health	3.93%	5.27%	3.47%	12.67%
Mindfulness/Meditation	1.20%	2.13%	1.73%	5.07%
Fitness	1.00%	4.40%	3.93%	9.33%
Mental Health	1.00%	2.60%	2.60%	6.20%
Nutrition	0.33%	1.53%	2.73%	4.60%
Self-tracking	0.67%	2.60%	2.60%	5.87%

Source: Authors.

Table 6. Mean level of agreement of different personal experiences of Portuguese young adults (1–5).

	Gender		Marital Status		Do You Have Children	
	Man (A)	**Woman (B)**	**Single (C)**	**Married or in Non-Marital Partnership (D)**	**Yes (E)**	**No (F)**
Using m-apps to inform myself about health	3.27	3.42	3.36	3.32	3.52 F	3.32
Controlling my health data using m-apps	2.92	3.16 A	3.02	3.11	3.19 F	3.01
Planning my physical training in m-apps	2.93	2.77	2.83	2.84	3.06 F	2.79
Analysing my physical performance/exercise through m-apps	3.03	2.97	2.97	3.04	3.12	2.96
Getting anxious when I do not have my phone	2.73	2.98 A	2.81	3.05 C	3.15 F	2.81
Seeing what i get written on commentary causes me anguish	2.51	2.36	2.39	2.56	2.68 F	2.38
Feeling pressure to have n account on social media	2.54	2.53	2.52	2.54	2.73 F	2.49

Source: Authors.

As Table 1 shows, the representative sample reveals a relatively balanced distribution between variables such as the two age sub-groups and between two gender variables: men and women. We highlight that 14 people actively identify beyond the binary. However, due to the size of the sample, it does not produce significant statistical data.

Despite the broad sociodemographic variables described in Table 1, this study focuses on the comparisons of proportions in the intersections with gender ("man" or "woman" as response options), marital status ("single" or "married or in non-marital partnership" as options, since the remaining options do not constitute a significant sample for statistical analysis) and also whether people have children ("yes" or "no"). Among the various sociodemographic options, these three intersections were chosen for the analyses in Tables 3, 4 and 6 since they are the ones that produce more statistically significant results, according to the performed inferential analysis procedures.

4. Results

More than 90% of the Portuguese young adults between 18 and 30 who responded to the survey affirm they use m-apps every day. Thus, 19 different types of apps were identified, as shown in Table 2. Respondents were questioned about their level of frequent use of each type of app. Table 2 shows the overall percentage of Portuguese young adults who use those apps widely (ranging between using such apps several times a week or even every day). The results show that social media (95.6%), email (88.9%) and messaging/videoconference apps (83.5%) stand out as the three most used types of apps among the 19 identified. Also, six types of apps are highlighted for belonging to a broader health and well-being category. Those apps are health apps (36.5%), mindfulness/meditation apps (18.7%), fitness apps (27.0%), mental health apps (19.1%), nutrition apps (19.1%) and self-tracking apps (33.5%). It should be stressed that health and self-tracking apps are among the 10 most frequently used apps.

Respondents were asked about the frequency of usage of different types of m-apps through a Likert scale of five possible answers ranging from "Everyday" to "Never". Afterwards, such answers were transformed into numbers from 1 to 5. Meaning 1: "Everyday". 2: "Several times a week". 3: "Once a week". 4: "Rarely" and 5: "Never". Mean responses were calculated, with lower numbers representing higher frequencies and numbers closer to 5 representing low frequencies of usage. Table 3 concerns inferential statistical procedures that compare different proportions, implying z-tests with a significance level of 0.05 to identify statistically significant differences. Results show that the average usage of health and wellbeing apps tends not to be made daily or even several times a week when the answers are analysed in terms of gender, marital status, and according to whether they have children or not. However, the answers reveal average usages between 2.75 and 3.90, which represents a range of average usages in the middle of the answers "Several times a week", "Once a week" and "Rarely". Between the results shown in Table 3, Portuguese young adults with children have a bigger average tendency to use health apps more frequently (2.75). On the other side of the spectrum, young people who do not have children reveal a perceived average tendency to less frequently use mindfulness/meditation apps (3.90). That type of app, mental health (also referred to as mHapps), and nutrition apps seem to reveal a generally less frequent usage.

Women's average usage of self-tracking apps (3.07) is statistically significantly more frequent than men's (3.59). Furthermore, regarding marital status, respondents that are married or in a non-marital partnership reveal statistically significantly more frequent average usages of health apps (2.79) and self-tracking apps (3.13) than the average answers of single Portuguese young adults (3.08 and 3.36, respectively). Finally, people who have children reveal a general tendency for more frequent average usage than a respondent who does not. In fact, the statistical differences are not significant only with fitness and self-tracking apps.

In general terms, single people and respondents who do not have children tend to lower average answered levels of usage of all types of health and wellbeing apps.

Portuguese young adults were surveyed about the importance of such types of apps to their lives. Answers ranged from 1 to 5, according to a Likert scale which represents the following answers: 1: "Completely disagree"; 2: "Disagree"; 3: "Neither disagree nor agree"; 4: "Agree"; 5: "Completely agree". Mean responses were calculated again. This time, a lower mean represents average disagreement towards that type of app being essential to the respondents' lives. In comparison, a higher mean may be interpreted as average agreement with such types of apps being essential to their lives. Table 4 indicates that the average level of importance answered ranges between 2.76 and 3.32. Mindfulness/meditation apps are averagely perceived as the least important type of app for men and respondents who do not have children (2.76). On the other hand, health apps are the ones that reunite the highest mean level of perceived importance, achieved with respondents who have children (3.32). In fact, health apps are the type of apps more averagely perceived as essential in a general sense, across demographic variables, compared to the remaining types of apps.

Women's average level of considered importance of self-tracking apps (3.16) is statistically significantly higher than men's (2.92). No other statistically significant differences were identified regarding gender. On that note, there are also no statistically significant differences regarding marital status. Regarding having children or not, participants who do have children reveal several statistically significantly higher average differences compared to those who do not have children. Specifically, Table 4 shows that people who have children have significantly higher average levels of perceived importance of mindfulness/meditation (2.97), mental health (3.20), and nutrition apps (3.13) in comparison to the average answered level of perceived importance between Portuguese young adults who do not have children (2.76 for mindfulness/meditation, 2.98 for mental health and 2.89 for nutrition apps).

In fact, among all the six types of apps, there is a tendency for a higher average perceived level of importance for women, people who are married or in a non-marital partnership, and respondents who have children.

Portuguese young adults were asked to specify, in ranked order, the three types of apps they use more. Health and wellbeing apps are not among the three most used types of apps by most respondents. However, a relevant preferable usage of health apps, in particular, exists, with 12.67% of respondents answering that such apps are among their three most used ones. Fitness apps were answered as one of the three most-used apps by 9.33% at that time. To both these results contributed, mainly, people answering health apps were their second most used type of apps (5.27%) and the ones who answered fitness apps were their second most used type (4.40%). Mental Health apps (mHapps) reached 6.20% of answers. Among the assemblage regarding health and wellbeing, the type of app that gathered the least percentage of answers of the top three most used type of apps was nutrition apps with 4.60% (Table 5).

Portuguese young adults answered several questions about their personal experiences online regarding their usage of such media and subsequent connection with their mental health and wellbeing. Answers ranged from 1 to 5, according to a Likert scale which represents the following answers: 1: "Completely disagree"; 2: "Disagree"; 3: "Neither disagree nor agree"; 4: "Agree"; 5: "Completely agree". Mean responses were again calculated. A lower mean represents a tendency for average disagreement towards such experience. In comparison, a higher mean may be interpreted as average agreement with such personal experience in the respondents' lives. Table 6 shows a range of means of answers from 2.36 (women's average agreement with the idea that is seeing what they get written on commentaries causes them anguish, which is, overall, a less agreed-with experience) to 3.52 (mean agreement of people who have children with using m-apps to inform themselves about health). In fact, Table 6 indicates a particular relevance of an agreement with the idea that Portuguese young adults use mobile applications to inform themselves about health. Higher statistically significant levels of the average agreement, specifically with the young adults who have children (3.52) compared to those who do not have children (3.32).

Gender and marital status seem to be a factor of few statistically significant differences. On the other hand, having children appears to be a constituent for differences in the level of agreement around personal experiences concerning young adults' uses of m-apps intertwined with their health and wellbeing. Six out of the seven personal experiences surveyed reveal a tendency for statistically significantly higher average agreement between young adults who have children compared to those who do not. Furthermore, it should be noted that the exception concerns analysing their physical performance/exercise through m-apps. In that case, people with children have a mean level of agreement of 3.12, while people who do not have children have a mean level of agreement of 2.96. Again, there is a higher average agreement between the respondents with children, but the difference is not statistically significant.

5. Discussion

Both descriptive and inferential statistical procedures were applied to describe the sample and corresponding preferred types of apps while establishing appropriate comparisons between proportions, indicating statistically significant differences through z-tests with a significance level of 0.05.

Data generated insights into the role of apps' overall health and wellbeing category in the lives of Portuguese young adults, which may be presented as a broader sense of digital wellbeing (Burr and Floridi 2020). The results indicate lower importance of these types of apps connected with the quality of self-care, stereotypically perceived as a feminine idea and interest. Findings—particularly the ones in Tables 3, 4 and 6—reinforce the hegemonic gender roles, which associate women with (self)care and reproduction. Such traditional gender roles are embedded in cultural models and images of "appropriate" masculine

and feminine roles constrained to the heteronormative model (Albright and Carter 2019; Comunello et al. 2020).

Portuguese young adults reveal low usage of health and wellbeing apps. In particular, a tendency for lower average usage of some of those m-apps between single people is noted and, more generally, between respondents who do not have children. Mindfulness/meditation, mental health and nutrition apps are generally less frequently used by Portuguese young adults. Concerning self-tracking apps, the perceived usage is more spread out in terms of regularity than the previously mentioned types of apps. However, women's average usage of self-tracking apps (3.07) is more frequent, with a statistically significant difference from men's (3.59). There are no significant statistical differences in terms of health and fitness apps. Similarly, those two types of apps reveal no significant statistical differences regarding the importance of health and wellbeing apps for the surveyed young adults. Furthermore, among all the six types of apps, there is a higher average perceived significance for women, married people or in a non-marital partnership, and respondents who have children. Nonetheless, those differences are not always statistically significant, which implies that a generalisation cannot be made regarding an average perceived importance of apps for women, married people or in a non-marital partnership and respondents who have children, compared with respondents who are men, single and do not have children. However, in particular, gender has been studied as a determining factor that influences the intention to use mHealth apps (Palos-Sanchez et al. 2021).

Even though this survey was implemented during the COVID-19 pandemic, a particular time with studied impacts on people's mental health (Oliveira et al. 2021; Lemenager et al. 2021), apps developed for mental health are not among the most frequently used types of apps for most of the respondents, as Table 2 reveals. Instead, mental health apps (mHapps) are more used and perceived as highly important among Portuguese young adults with children. Nevertheless, results do not follow the documented international increase in the popularity of mHealth apps focused on mental health. In fact, Rathbone and Prescott (2017) report a substantial number of apps for a wide range of health and wellbeing issues. In that sense, both health apps (36.5%) and self-tracking apps (33.5%) were ranked among the top 10 most frequently used types of apps. Such robust percentages of widespread usage may be connected to increased relevancy of any health and wellbeing matters of the COVID-19 era, which expanded the importance of the quality of care. However, the frequent usage of Portuguese young adults' mental health apps does not follow such reported increase in other countries considering the use of this type of app in the context of the COVID-19 pandemic. Nonetheless, registered increased overall media consumption during the COVID-19 pandemic may be interpreted as a factor of increased risk for wellbeing and mental issues, or at least as a coping strategy to deal with such traumatic issues (Lemenager et al. 2021).

Using m-apps to stay informed about health is widespread in the sample, especially among Portuguese young adults who have children (3.52). More than gender, having children is a factor for statistically significantly higher frequencies of six of the seven surveyed personal experiences regarding health and wellbeing through the digital. Likewise, respondents who have children are the ones who more frequently use and consider such apps to be of higher importance. It occurs with statistically significant differences for three out of the six types of apps between the broader health and wellbeing category of apps. Therefore, the results of this paper may be in some form aligned with other works that state that substantial general uses of health-focused technologies, like mHealth apps, are usually linked with women, highly educated (Wang et al. 2021), and younger people (Bol et al. 2018; Schomakers et al. 2022).

6. Conclusions

The research presented in this article is part of a more extensive study that aims to understand how young adults engage with mobile applications, incorporating them into their everyday lives, practices, mediated interactions, also (re)negotiating their gender and sexual identities. In this paper, we analysed the uses of mobile health applications by young Portuguese adults focusing on the following research question: How do the uses of m-apps by young adults interact with health and wellbeing from a gender perspective?

The literature revealed that mHealth apps are increasingly being used and have played an important role during the pandemic. Nevertheless, our data analysis showed low usage of health and wellbeing apps by Portuguese young adults. Furthermore, the results highlight a reinforcement of hegemonic gender roles, which associate women with (self)care and reproduction.

Considering the data collected in this online survey, we ultimately call for research that further explores the intersection of parenting and gender variables. This would prove essential to understanding if highlighted results regarding people who have children compared to those who do not are statistically significantly different because such respondents have children, as well as women who have children. Nonetheless, this study points to a continuation of traditional societal rules and norms by a younger generation of Portuguese adults (from 18 to 30 years old), in which being a woman, being in a heterosexual marriage (or similar partnership) and having children are determinant in seeking information on health and wellbeing topics, as well as in attributing higher importance to the quality of care and, therefore, translates into their higher use of digital technologies like mobile applications.

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