



Original article

Dating app users: Differences between middle-aged men and women

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ABSTRACT

The scientific literature generated as a result of the appearance and popularization of the use of dating apps still has some important limitations. Among them, the one that has focused particularly on some groups (men who have sex with men, university students) while ignoring others, stands out. Therefore, this study aimed to analyze the characteristics of dating app usage in middle-aged heterosexual people, paying special attention to the differences between men and women. A total of 298 heterosexual current dating app users (41.3 % women, 58.7 % men), aged between 25 and 50 years ($M = 37.67$, $SD = 6.99$), completed a battery of online questionnaires. Regular and intense use of dating apps was found in middle-aged people. Compared to women, men use more dating apps, have used them for a longer time, use them to a greater extent for casual sex, and for more time per day. It was also found that the time spent on dating apps and having a partner allowed for predicting some behaviors and relationships that arose in the apps. Knowing middle-aged people's dating app usage profiles and the differences between men and women will have relevant implications when designing and implementing preventive strategies and promoting these apps' recreational and responsible use from a gender perspective.

The appearance and rapid popularization of dating apps have revolutionized how people meet and interact with potential romantic and/or sexual partners worldwide in just a decade. It is estimated that there are currently around 350 million people who use an app to flirt (Curry, 2024), that more than ten million people use Tinder daily (Duncan & March, 2019), and that more than a quarter of the new romantic couples that are formed originate in these apps (Neyt et al., 2019). Thus, dating apps have implied a change in how we behave and relate to each other and, moreover, they pose different challenges from a psychosocial point of view (Castro & Barrada, 2020).

Nowadays, there is extensive literature on dating applications, their uses, the characteristics of their users, and their correlates. However, due to the recentness of the phenomenon, there are still many gaps in the published literature, in addition to many inconclusive results. For example, studies have focused particularly on certain groups while ignoring other groups. The most studied group concerning the use of dating apps is that of men who have sex with men (MSM) because they were the first to use these applications due to their high prevalence rates – much higher than those of the rest of the groups – and to different risks associated with problematic consumption and risky sexual behaviors (Badal et al., 2018; Castro et al., 2020; Hahn et al., 2018; He et al., 2024).

In recent years, and thanks to the popularization of Tinder, there

have been many more studies on the heterosexual population also including men and women, although mainly focused on young university students (see, for a review, Bonilla-Zorita et al., 2021; Castro & Barrada, 2020; Wu & Trotter, 2022), but many of these studies find higher levels of usage prevalence in people aged 25 and over (LeFebvre, 2018; Ranzini & Lutz, 2017). To date, only one study (Dwyer et al., 2020) was focused on middle-aged people, which shows that their dating app usage and motives may differ from those of young people because they have different life goals and more difficulty finding a partner at certain ages.

Studies carried out on young heterosexual men and women have found some differences in how men and women behave on dating apps. For example, although men continue to have a higher usage prevalence rate, as well as greater frequency and intensity of use (Castro et al., 2020; Sumter & Vandenbosch, 2019; Weiser et al., 2018) – although the differences are shrinking – women make more selective and effective use of these applications: they accumulate more matches much faster than men, which gives them a greater choice and also more control (Timmermans & Courtois, 2018). Similarly, it seems that men tend to use dating apps only to have casual sex to a greater extent than women (Bonilla-Zorita et al., 2021; Castro & Barrada, 2020).

In the rest of the variables related to behaviors on dating apps, either no differences between men and women were found or they were not

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sought directly. In general, it has been found that active users of these applications use them frequently, and that this use leads them to offline interactions with the people they contact on the apps. For example, [Sumter and Vandenbosch \(2019\)](#) found that 23 % of Tinder users entered the app daily, and [Chin et al. \(2019\)](#) stated that these users could spend up to 90 min daily on it. As for the results of the app use, most of the studies consulted found that between 50 and 70 % of dating app users have had an offline encounter with another person they met on an app ([Macapagal et al., 2019](#); [Sumter & Vandenbosch, 2019](#)). [Strugo and Muise \(2019\)](#) concluded that just over half of their participants had some sexual contact with people they met on Tinder, while a third had found a romantic partner on the app.

To date, different analyses and classifications have been carried out on the reasons for using dating apps ([Orosz et al., 2018](#); [Ranzini & Lutz, 2017](#); [Sumter & Vandenbosch, 2019](#); [Timmermans & DeCaluwé, 2017](#)), which usually include both adaptive reasons (e.g., curiosity, entertainment, socializing, relationship-seeking) and reasons with a negative nuance (e.g., social approval, peer pressure, ex-partner revenge). The conclusions of these studies often contradict the stereotype that apps are used only, or mostly, for casual sex. In fact, it seems that although having casual sex is a present motivation – more for men than for women – it is not one of the most reported. People, especially young university students, indicate other reasons for use, such as curiosity, entertainment, or meeting people of their own sexual orientation.

The present study

One of the main limitations in the existing literature on dating apps is that it has focused primarily on specific groups, either due to their high usage prevalence (MSM), or the easy access to samples (young university students). Thus, there are hardly any studies that analyze the use of dating apps in middle-aged heterosexual people, who may have different uses and motivations from those of young people because they are at a different stage and have different life needs. As there are no studies on this group, it is unknown whether there are differences between middle-aged men's and women's behavior on dating apps. Therefore, the main objective of this study was to analyze the characteristics of dating app usage in middle-aged people (25–50 years old), taking into account the differences between heterosexual men and women. This knowledge will allow us to better respond to the challenges and needs posed by technological development and its influence on how we behave and relate to each other at different life stages.

Method

Participants and procedure

The present study is part of a larger project that aims to analyze the characteristics of the use and the users of dating apps among middle-aged people. The initial sample of the project comprised 1004 participants of both sexes (50.7 % women, 49.3 % men), aged between 25 and 50 ($M = 36.61$, $SD = 7.16$). Of these 1004 participants, 39 % ($n = 392$) declared themselves to be current dating app users. The meaning of “current” is that they, at the time of answering the survey, were users and had also used a dating app in the three months before participating in this study. Based on this sample, and given the main objective of the present study, two inclusion criteria were used: (1) being a current dating app user (612 participants excluded) and (2) describing themselves as heterosexual (94 participants excluded). After applying these criteria, the final sample included 298 middle-aged heterosexual people (41.3 % women, 58.7 % men) aged between 25 and 50 ($M = 37.67$, $SD = 6.99$) and current dating app users. The mean age of the men was 38.72 years ($SD = 7.04$), and of the women, 36.19 years ($SD = 6.68$).

Concerning relationship status, 30.9 % ($n = 92$) had a romantic partner at the time of data collection, while 69.1 % ($n = 206$) did not. Regarding the level of education, 5.7 % ($n = 15$) of the participants had

basic education, 35.6 % ($n = 105$) had intermediate studies, and 59.7 % ($n = 178$) had higher studies. Differences in sociodemographic variables based on gender can be found in [Table 1](#).

Regarding the procedure, data were collected in January 2024 through the data collection company *Netquest*. The participants were recruited from the company's panelists' sample to maintain the national representativeness of middle-aged people in terms of sex and age. The survey remained open for 10 days. This procedure was approved by the Ethics Review Board for Clinical Research of the region (PI24/249).

Instruments

Sociodemographic questionnaire. We asked participants about their gender (men, woman), age, sexual orientation (heterosexual, homosexual, bisexual, others), relationship status (in a relationship or not), and education level (no formal education, basic, intermediate, high education).

Dating app use questionnaire. Participants were asked if they currently used any dating app. Those who answered yes had to answer two groups of questions. Firstly, about their behavior on the apps: how many apps and which ones they used (multiple choice: Tinder, Badoo, Bumble, Grindr, Meetic, Adopta un tío, OKCupid, Other), since when (months; hereafter, “app usage track”), how often (less than once a week, about once a week, between two and six times a week, about once a day, several times a day), average connection time (minutes), and the main motives for their use (multiple choice: entertainment, curiosity, socializing, belongingness, casual sex, romantic partner, ex-partner revenge, sexual orientation, other reasons). Secondly, they were asked about the results of using the apps. They were asked (1) with how many people they had met on the dating apps they had a face-to-face encounter; (2) they had sexual intercourse; (3) they had a romantic relationship; and (4) they had a friendship.

Data analysis

The analyses were carried out with the statistical analysis program JAMOVI v.2.3 ([The Jamovi Project, 2022](#)). First, the variables were compared according to the participants' gender, calculating the descriptive statistics of all the variables and the gender differences. Next, the associations between variables were calculated using Spearman's correlations, as not all variables followed a normal distribution. Next, regression analyses were performed to explain the variability in behavior on dating apps (number of apps used, app usage track, daily minutes spent on apps), as well as the number of encounters (face-to-face and sexual) and the number of relationships (romantic and friendship) participants have had through the apps. In these analyses, the interaction of gender with all the predictor variables was introduced in a second step to analyze the differences between men and women. As men were coded as 0 (variable dummy), positive values refer to women.

Results

[Table 1](#) shows the differences between men and women in the sociodemographic variables (age, relationship status, educational level), as well as in the main characteristics of dating app usage by middle-aged people (number of apps, app usage track, daily time of use, apps used, reasons for use) and in the results of that use (number of face-to-face encounters with people met on the apps, number of casual sexual relationships, number of romantic partners, and number of friends). Regarding the sociodemographic variables, it was found that men were slightly older than women ($T = 3.123$, $p = .002$), that there was a higher proportion of men than women with a partner ($\chi^2 = 10.90$, $p < .001$), and that there was a higher proportion of women than men with university studies ($\chi^2 = 10.50$, $p = .005$).

As can also be seen in [Table 1](#), there are some differences between men and women in different behavioral variables on dating apps, all of

Table 1
Descriptives and differences between men and women.

Variable	Levels	Male	Proportion	Female	χ^2	<i>p</i>	<i>V</i>
Education	Primary	14		6	10.50	.005	.188
	Secondary	70		30			
	University studies	91		87			
Relationship	No	108		98	10.90	< 0.001	.191
	Yes	67		25			
Motives for use apps	Meet people	102 (58.3 %)		69 (56.1 %)	0.141	.707	.022
	Stable relationship	92 (52.6 %)		74 (60.2 %)	1.69	.194	.075
	Entertainment	73 (41.7 %)		58 (47.2 %)	0.868	.352	.054
	Casual sex	100 (57.1 %)		29 (23.6 %)	33.1	< 0.001	.334
	Curiosity	48 (27.4 %)		38 (30.9 %)	0.423	.516	.038
	Find people with the same sexual orientation	34 (19.4 %)		10 (8.1 %)	7.33	.007	.157
	Sense of belonging	10 (5.7 %)		3 (2.4 %)	1.86	.173	.079
	Revenge towards a former partner	10 (5.7 %)		2 (1.6 %)	3.12	.078	.102
	Other reasons	5 (2.9 %)		6 (4.9 %)	0.830	.362	.053
	Apps used	Tinder	147 (84.0 %)		98 (79.7 %)	0.924	.336
Badoo		12 (6.9 %)		5 (4.1 %)	1.05	.306	.059
Bumble		45 (25.7 %)		31 (25.2 %)	0.009	.921	.006
Grindr		30 (17.15)		20 (16.3 %)	0.040	.841	.012
Meetic		76 (43.4 %)		26 (21.1 %)	15.900	< 0.001	.231
Adopta un tío		13 (7.4 %)		9 (7.3 %)	0.001	.971	.002
Okcupid		13 (7.4 %)		7 (5.7 %)	0.348	.555	.034
Others		23 (13.1 %)		9 (7.3 %)	2.560	.110	.093
Variable			Mean (standard deviation)	Test	<i>p</i>	<i>d</i>	
Age		38.72 (7.038)	36.19 (6.683)	3.123	.002	.367	
Apps	2.05 (1.16)	1.67 (1.128)	2.857	.005	.336		
App usage track		51.78 (48.549)	36.77 (35.151)	8870	.010	.176	
Daily time on apps	76.56 (132.758)	36.77 (59.847)	1.175	.007	.138		
Face to face	9.18 (15.444)	7.27 (8.215)	<i>10,090</i>	.356	.063		
Sexual	5.45 (11.363)	3.39 (5.815)	<i>10,277</i>	.502	.045		
Romantic	0.72 (0.975)	0.805 (1.053)	-0.072	.475	-0.084		
Friendship	2.36 (4.029)	1.85 (2.633)	1.242	.215	.146		

Note. Test = values in italics refers to nonparametric test (Mann-Whitney' *U*). Apps: number of dating apps used; Apps usage track: Length of time using apps, in months; Daily time on apps: Daily time spent on dating apps, in minutes. Face-to-face: number of face-to-face encounters; Sexual: number of sexual relationships; Romantic: number of romantic relationships; Friendship: number of friendships. Comparisons between genders in relationship status, motives for using apps, and apps used are based on dichotomic values (e.g., use Tinder or not).

them pointing to higher values in men. Thus, men use apps more than women to seek casual sex ($\chi^2 = 33.11, p < .001$), they use the Meetic portal more than women ($\chi^2 = 15.900, p < .001$), they use a greater number of apps ($T = 2.857, p = 005$), and they have a longer app usage track ($U = 8870, p = .010$).

The associations between the variables are presented in Table 2. In the case of men, being currently in a relationship was positively associated with all the variables of interest except for the number of face-to-face encounters ($|Mr| = 0.260$, range [-0.155, 404]). Variables related to app behavior were also positively related to each other for men ($Mr = 0.148$, range [.149, 192]), and the same was true for app results ($Mr = 0.591$, range [.425, 879]). The correlation between the number of face-to-face encounters and sexual encounters ($r = 0.879, p < .001$) was particularly noteworthy, suggesting a high overlap between these two

variables.

In the case of women, the variables behaved similarly, although currently being in a relationship was only related to the number of apps ($r = 0.376, p < .001$), the daily time spent on them ($r = 0.276, p = .002$) and the number of romantic relationships ($r = 0.427, p < .001$). Among the variables related to the use of apps, there was no association between the number of apps and their app usage track ($r = 0.157, p = .083$). As for the results of app usage, all of them were positively associated with each other, but less strongly than in the case of men ($Mr = 0.429$, range [.349, 692]). Again, the highest association was between the number of face-to-face encounters and sexual encounters ($r = 0.692, p < .001$).

Regression models were used to explain dating app behavior (Table 3) and dating app usage outcomes (Table 4). Table 3 shows that Step 2 of the regression was only significant for predicting the number of

Table 2
Associations between variables.

Variable	1	2	3	4	5	6	7	8	9
1. Age		-0.030	.065	.261**	.146	-0.021	-0.003	.028	.117
2. Relationship	-0.155*		.376***	.101	.276**	-0.005	.055	.427***	.148
3. Apps	.037	.147		.157	.182*	.039	-0.012	.304***	.156
4. App usage track	.147	.204**	.149*		.273**	.401***	.245**	.275**	.255**
5. Daily time on apps	-0.078	.404***	.153*	.192*		.309***	.183*	.314***	.281**
6. Face-to-face	.043	.143	.149*	.256***	.245**		.692***	.352***	.387***
7. Sexual	-0.027	.215**	.098	.257***	.316***	.879***		.386***	.349***
8. Romantic	-0.078	.383***	.331***	.298***	.350***	.482***	.456***		.409***
9. Friendship	-0.020	.199**	.145	.130	.351***	.425***	.444***	.429***	

Note. Relationship: 0 = no; 1 = yes; Apps: number of dating apps used; Apps usage track: Length of time using apps, in months; Daily time on apps: Daily time spent on dating apps, in minutes; Face-to-face: number of face-to-face relationships; Sexual: number of sexual encounters; Romantic: number of romantic relationships; Friendship: number of friendships. The data above the diagonal refers to females, whereas the data below the diagonal refers to males.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Multiple regression analysis of dating app behavior.

	Apps			Apps usage track			Daily time on apps		
	R ²	F	p	R ²	F	p	R ²	F	p
Step 1	.107			.063			.046		
Step 2	.130	3.83	.023	.067	.698	.499	.056	1.58	.208
Step 1	b	SE	p	b	SE	p	b	SE	p
Intercept	1.545	0.381	< 0.001	6.370	14.851	.668	99.770	37.004	.007
Gender	-0.239	0.135	.076	-10.530	5.246	.046	-9.720	13.070	.458
Age	0.006	0.009	.529	1.080	0.364	.003	-1.040	0.907	.254
Relationship	0.727	0.142	< 0.001	9.780	5.517	.077	44.310	13.746	.001
Step 2	b	SE	p	b	SE	p	b	SE	p
Intercept	1.581	0.482	.001	7.587	18.972	.690	149.964	47.130	.002
Gender	-0.191	0.730	.794	-15.698	28.754	.586	-132.054	71.430	.066
Age	0.008	0.012	.526	1.003	0.468	.033	-2.320	1.160	.047
Relationship	0.465	0.172	.007	13.957	6.757	.040	42.923	16.790	.011
Gender x Age	-0.007	0.019	.710	0.232	0.747	.757	3.284	1.860	.078
Gender x Relationship	0.807	0.299	.007	-13.051	11.766	.268	-0.033	29.230	.999

Note. Gender: 0 = male; 1 = female; Relationship: 0 = no; 1 = yes; Apps: number of dating apps used; Apps usage track: Length of time using apps, in months; Daily time on apps: Daily time spent on dating apps, in minutes.

Table 4
Multiple regression analysis of outcomes of the use of dating apps.

	Face-to-face			Sexual			Romantic			Friendship		
	R ²	F	p	R ²	F	p	R ²	F	p	R ²	F	p
Step 1	.133			.090			.242			.061		
Step 2	.151	1.25	.286	.080	1.54	.178	.263	1.65	.146	.068	0.443	.818
Step 1	b	SE	p	B	SE	p	b	SE	p	b	SE	p
Intercept	535.964	438.726	.223	37.621	329.649	.255	0.001	0.318	.999	-0.803	124.041	.518
Gender	-0.389	151.106	.797	-11.636	113.538	.306	0.335	0.110	.002	-0.088	0.4272	.837
Age	-0.054	0.106	.608	-0.044	0.07933	.576	-0.007	0.008	.381	0.041	0.030	.176
Relationship	-0.212	166.655	.899	0.418	125.221	.739	0.531	0.121	< .001	-0.242	0.471	.608
Apps	0.252	0.648	.698	0.022	0.48656	.964	0.229	0.047	< .001	0.509	0.183	.006
Apps usage track	0.108	0.017	< .001	0.061	0.01255	< .001	0.005	0.001	< .001	0.009	0.005	.050
Daily time on apps	-0.001	0.007	.848	0.001	0.00504	.947	0.001	0.001	.157	0.002	0.002	.261
Step 2	b	SE	p	B	SE	p	b	SE	p	b	SE	p
Intercept	215.078	563.126	.703	167.018	422.079	.693	0.187	0.407	.647	-115.647	160.321	.471
Gender	727.380	847.137	.391	373.010	634.954	.557	0.026	0.613	.966	0.693	241.179	.774
Age	-0.023	0.136	.868	-0.032	0.102	.753	-0.012	0.010	.208	0.043	0.039	.269
Relationship	-0.820	199.049	.681	-0.477	149.193	.750	0.441	0.144	.002	-0.107	0.567	.851
Apps	0.912	0.815	.264	0.528	0.611	.388	0.290	0.059	< .001	0.594	0.232	.011
Apps usage track	0.126	0.020	< .001	0.078	0.015	< .001	0.004	0.001	.005	0.011	0.006	.045
Daily time on apps	-0.003	0.007	.709	0.001	0.005	.873	0.001	0.001	.301	0.001	0.002	.495
Gender x Age	-0.078	0.218	.722	-0.012	0.163	.944	0.009	0.016	.563	-0.009	0.062	.883
Gender x Relationship	208.794	371.180	.574	316.064	278.210	.257	0.368	0.268	.171	-0.520	105.675	.623
Gender x Apps	-197.667	137.908	.153	-147.090	103.366	.156	-0.206	0.100	.040	-0.235	0.393	.550
Gender x Apps usage track	-0.068	0.038	.073	-0.060	0.028	.035	0.004	0.003	.161	-0.008	0.011	.472
Gender x Daily time on apps	0.0164	0.020	.434	-0.002	0.016	.896	0.001	0.002	.377	0.007	0.006	.261

Note. Face-to-face: number of face-to-face encounters; Sexual: number of sexual encounters; Romantic: number of romantic relationships; Friendship: number of friendships; Gender: 0 = male; 1 = female; Relationship: 0 = no; 1 = yes; Apps: number of dating apps used; Apps usage track: Length of time using apps, in months; Daily time on apps: Daily time spent on dating apps, in minutes.

apps used, such that gender only had an indirect relationship in this criterion variable. Specifically, about the number of apps used, 13 % of the variance was explained by the fact of being currently in a relationship ($b = 0.465, p = .007$), an effect that was higher in the case of women ($b = 0.807, p = .007$). Concerning the app usage track, 6.3 % of the variance was explained by being male ($b = -10.530, p = .046$) and older ($b = 0.364, p = .003$). The third variable related to app usage is the daily time spent on them, where 4.6 % of the variance was explained by the fact of being currently in a relationship ($b = 44.310, p = .001$).

Table 4 presents predictive models for four types of app usage outcomes: number of face-to-face, sexual, romantic, and friendship encounters. In all cases, the second step was not significant, so the interaction of gender with the other variables was irrelevant to the predictive model. In the case of face-to-face encounters, 13.3 % of the variance was explained exclusively by app usage track ($b = 0.108, p < .001$), and the same occurred with the number of sexual encounters (9.0 % of the variance, $b = 0.061, p < .001$). 26.3 % of the variability of the

number of romantic relationships was explained by being a woman ($b = 0.335, p = .002$), being in a relationship ($b = 0.531, p < .001$), the number of apps used ($b = 0.229, p < .001$), and app usage track ($b = 0.005, p < .001$). Finally, 6.1 % of the variability of the number of friendships through apps was explained by the number of apps used ($b = 0.509, p = .006$).

Discussion

The emergence and popularization of the use of dating apps in the last decade has led to researchers' increased interest in this topic. There is already extensive literature on dating apps' uses, users, and correlates. However, this literature has some limitations. The most relevant is perhaps that it has focused on some specific groups (e.g., MSM, university students) while neglecting other groups that have a significant usage prevalence of these applications. Therefore, this study aimed to analyze the use and user profiles of dating apps in middle-aged

heterosexual people, paying special attention to the differences between men and women.

Once this usage profile has been drawn up and the differences between men and women in the use of dating apps have been analyzed, some conclusions can be drawn, and several issues can be raised for the future. First of all, in terms of the characteristics of dating app usage, the study participants use one or two apps at a time, keep them active for at least the three previous years, use them actively and intensively (around 45 min a day), and the most used apps are Tinder, Bumble, and Meetic. So far, these results are similar to those found in studies carried out with young university students (see, for a review, Bonilla-Zorita et al., 2021; Castro & Barrada, 2020; Wu & Trottier, 2022).

Differences are observed in the reasons for use and the results of using apps. Middle-aged people indicate they use them to meet people or to seek stable relationships as their main reasons, with entertainment being the fourth most indicated reason. Previous studies carried out mainly with young people concluded that the main reasons for using apps were curiosity or entertainment (Orosz et al., 2018; Ranzini & Lutz, 2017; Sumter & Vandenbosch, 2019; Timmermans & DeCaluwé, 2017). Therefore, it can be seen that middle-aged people who use dating apps clearly want to meet people and establish a relationship. These people are at another life stage and probably find it more difficult to meet and relate to people their age than young people. As a result of this age difference with young people from previous studies, a greater number of encounters with people they met on the apps was also found in middle-aged participants.

As in the previous literature, more frequent and intense use of dating apps by men was found (Castro et al., 2020; Sumter & Vandenbosch, 2019; Weiser et al., 2018). Specifically, they used more different apps than women, had a longer app usage track (more than four years on average compared to three years), and used them for twice as much time per day as women (76 vs. 37 min). In addition, men used apps to a much greater extent than women to engage in casual sex (57.1% vs. 23.6 %). This result is consistent with those of previous studies (Sumter & Vandenbosch, 2019; Timmermans & DeCaluwé, 2017) and has been highlighted in several reviews (see, for example, Bonilla-Zorita et al., 2021). However, it should be noted that men show greater interest in and willingness to engage in casual sex than women, regardless of the use of dating apps (Castro & Correa, 2023; Correa et al., 2017). Therefore, this may explain the differences observed, at least in part. Finally, the fact that there were no significant differences between men and women in the number of encounters and interactions with other people they met through apps seems to confirm that women make more efficient use of apps than men: they use them less but get similar results (Timmermans & Courtois, 2018).

Lastly, concerning the variables that allowed predicting both the behavior on the apps and the results of their use (encounters and relationships), some results that seem logical, and other novel results were obtained. Among the former, it should be noted that the app usage track allowed predicting the number of face-to-face encounters, sexual encounters, and the number of romantic relationships; that being older predicted the app usage track, and that the number of apps used predicted the number of romantic partners and friendships. In all these cases, it was found that the more time spent on apps (vital and/or app use), the more likely people are to meet and interact with other individuals.

The most striking results of this study probably have to do with having a partner. First, it was found that 30 % of the participants—all dating app users—had a partner. This is a slightly higher percentage than that found in previous studies (Alexopoulos et al., 2020; Timmermans & Courtois, 2018) and may be due to several reasons, such as the fact that a relevant percentage of middle-aged people are in open and/or non-monogamous relationships, or that some people on apps are open to committing infidelity (Alexopoulos et al., 2020; Weiser et al., 2018). Second, significant differences were found between the participants in the proportion of men and women with a partner (38.3% vs. 20.3 %).

Third, having a partner was directly associated with the number of apps used, the daily time spent on the apps, and the number of romantic partners met through the apps. The clearest explanation for this result is the sample imbalance between men and women with a partner. The fact that there are almost twice the proportion of men than women with a partner and that they make more frequent and intense use of apps can decisively influence these findings. However, further research into this variable must be carried out in future studies to find out why middle-aged people with a partner continue to use dating apps.

Limitations and future directions

The conclusions of this study should be taken with some caution due to some limitations that should be noted, mainly regarding the study's methodology. The first limitation concerns the sample: is not very large (298 participants, although they are all dating app users) and, above all, it includes people from a very wide age range (25–50 years). Participants are at different life stages, with different lifestyles, skills and needs, making it difficult to draw general conclusions from such a large and varied group of people. The study's main objective was to provide an overview of dating app use in middle age while acknowledging this limitation. Regarding the sample, other minor limitations can be highlighted, but these affect the results, such as the fact that there are more men than women with a partner or that men are slightly older than women (2.5 years on average).

Second, the instrument used has not been validated. This questionnaire was developed *ad-hoc* by the manuscript's authors based on the study's objective. Questions on different topics and with varied formats were included, which made validation difficult. Some questions could have been added to the questionnaire that would have been quick to answer (e.g., "Since when do you have a partner?") and would have provided relevant information. Furthermore, asking about different topics and using different time frames (e.g., how long they have been using dating apps or whether they had a partner), can make it difficult to analyze and interpret the results. Third, and like most existing literature on sexuality, this is basically a descriptive and cross-sectional study, which only allows knowing the reality at a given time.

In future studies, this issue should be approached from a longitudinal point of view to analyze the participants' evolution regarding the uses of dating apps and their motivations. In addition, it is considered that all the variables evaluated in this study should be examined: (1) more studies of middle-aged people are needed, but with smaller age ranges and including people of all sexual orientations; (2) the differences between men and women should continue to be analyzed, in all age groups; and (3) more research is needed on the role of some variables, such as having a partner.

Conclusions

Dating apps have opened up a new context in how we get to know each other and relate to each other, totally influenced by technological advances, which change suddenly and quickly. Therefore, these challenges must be responded to quickly and based on knowledge of how apps are used and the characteristics and differences among the users. Therefore, it is considered that the present study makes some relevant contributions. First, an important gap in the existing literature has been filled, which is the absence of studies analyzing how middle-aged heterosexual people use dating apps. Second, the usage differences between men and women have been analyzed, finding that both genders participate in the phenomenon of dating apps, regardless of their age. And third, some topics have been raised for discussion, such as the use of dating apps by people with a partner, which will surely give rise to future studies.

Developing a user profile and a dating app usage profile for middle-aged people is important for designing strategies to promote the recreational consumption of these applications and to avoid problematic

consumption, as some reviews point out (Bonilla-Zorita et al., 2021; Cruz et al., 2024; Gori et al., 2024). This knowledge can also be used to design more specific intervention and treatment programs for those people who are beginning to develop an uncontrolled, compulsive behavior that may point to an addictive profile on these platforms. In addition, knowing the possible differences between men's and women's use of dating apps and the variables involved can favor all these preventive strategies, promote a gender perspective of their recreational use, and attend to the usage particularities of both sexes.

Ethics approval and consent to participate

The procedure of this study complies with the ethical standards of the Helsinki Declaration of 1975, as revised in 2008. This procedure was approved by the Ethics Review Board for Clinical Research of Aragon (Spain), with the reference number PI24/249. All participants were informed about the nature of the study and all provided informed consent.

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Declaration of competing interest

The authors declare that they have no competing interests.

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