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RESEARCH ARTICLE

Exploring Social Media Privacy Concerns: A Comprehensive Survey Study Across 16 Middle Eastern and North African Countries

ALI FAROOQ[1], (Senior Member, IEEE), JONI SALMINEN[2], JUSTIN D. MARTIN[3], KHOLOUD ALDOUS[4], SOON-GYO JUNG[4], AND BERNARD J. JANSEN[4], (Senior Member, IEEE)

[1]Department of Computer and Information Sciences, University of Strathclyde, Glasgow, U.K.
[2]School of Marketing and Communication, University of Vaasa, 65200 Vaasa, Finland
[3]Department of Journalism and Digital Communication, University of South Florida, St. Petersburg, FL 33701, USA
[4]Qatar Computing Research Institute, Hamad Bin Khalifa University, Doha, Qatar

Corresponding author: Bernard J. Jansen (jjansen@acm.org)

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ABSTRACT The wide use of social media raises numerous privacy concerns, with limited studies of the Middle East and North Africa (MENA) region. This study presents an in-depth analysis of social media privacy concerns in sixteen MENA countries, a timely and important topic in an under-studied region. A census-representative sample (N = 8140) was collected using an online panel survey from Algeria (n = 551), Bahrain (n = 453), Egypt (n = 522), Iraq (n = 526), Jordan (n = 580), Kuwait (n = 459), Lebanon (n = 485), Libya (n = 486), Morocco (n = 530), Oman (n = 471), Palestine (n = 486), Qatar (n = 489), Saudi Arabia (n = 521), Tunisia (n = 574), United Arab Emirates (n = 479), and Yemen (n = 528). Results show multi-level privacy differences in the Gulf, Levant, and North Africa regions, among countries in a region, and within a country based on gender, age, educational level, and resident status (expat vs. national). Results show the concerns and attitudes towards social media privacy in the MENA region, identifying factors contributing to these perceptions with implications for developing platforms and policies to address the unique privacy concerns of social media users in the MENA region.

INDEX TERMS Social media, privacy, Middle East, North Africa, MENA, privacy concerns, regulators, cross-country.

I. INTRODUCTION

Social media is an integral part of daily life globally, affecting how people communicate, share information, and connect. More than a billion users are active on social media like Facebook, YouTube, WhatsApp, Instagram, WeChat, and TikTok every month, and the number of social media users worldwide is expected to reach 5.85 billion by 2025, highlighting the increasing importance of social media globally [1], [2]. Social media sites enable people to communicate with others, discover like-minded people, and participate in discussions and debates about varied subjects [3]. Businesses increasingly use social media as a tool for marketing, consumer interaction, and sales [4], [5], [6]. Shopping on social media is anticipated to reach $1.2 USD trillion globally by 2025, underscoring social media's significance for businesses [7]. As such, using social media is an important and impactful area for research.

However, social media imposes privacy concerns [4], [8], [9]. Users generate massive amounts of data [10] through content sharing and provide personal information to be able to access social media [3], [8], [11]. Social media platforms glean much user data that is not directly provided by

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users, including browsing history, network data, and online activities [12]. Privacy and security concerns are raised by third-party businesses that exchange such data to deliver tailored services [12], [13]. Data breaches and privacy violations are rising, and incidents like the *Cambridge Analytica* case have highlighted the need for privacy protection [14]. Users have expressed privacy concerns about potential threats from *other* social media users [8], [15] as well as from *regulators* due to regulatory frameworks and government surveillance [16], [17].

Some studies have been conducted to better understand users' privacy concerns in social media [4], [8]. However, much research focuses on Western contexts [18], [19], [20]. Prior studies on social media have discovered that privacy concerns vary by country [21], [22], though findings are not sufficiently localized to address the needs and technology usage patterns of populations in the *Global South* [23], [24]. Repeated calls for inclusive security and privacy (for example, [18], [25]) have been responded to, and researchers have started to examine security and privacy issues in under-served populations and people from non-Western, developing countries in the Global South [19], [21], [26], [27].

One prominent region is the *Middle East and North Africa* (MENA), which has a unique cultural, political, and religious context and shows distinct online behaviors greatly influenced by family and cultural norms [20], [28], [29]. Though some studies have examined privacy concerns of social media users of a few countries from the MENA region, such as Saudi Arabia and Qatar [30], [31], a comprehensive understanding of the MENA population's *social media privacy* (SMP) attitudes is currently lacking. This research gap is significant, given the cultural, social, and regulatory diversity of the MENA region and the high penetration of social media in these countries. By addressing this gap, our study contributes to the broader understanding of social media privacy in the MENA region.

More precisely, we examine SMP concerns in 16 MENA countries: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Kingdom of Saudi Arabia (KSA), Tunisia, United Arab Emirates (UAE), and Yemen. These 16 countries share a similar language and are similar across multiple cultural dimensions [32]. They can broadly be divided into three regions: (1) *North Africa* (Algeria, Egypt, Libya, Tunisia, and Morocco); (2) *Levant* (Iraq, Jordan, Lebanon, and Palestine); and (3) *Gulf* (Bahrain, Kuwait, Oman, Qatar, KSA, UAE, and Yemen). As existing research suggests that demographic factors such as age, gender, and nationality affect digital privacy concerns [33], [34], such effects are likely present in MENA countries, too.

To our knowledge, the current study is the largest examination of SMP attitudes and concerns in the MENA as of the study date. Our research uniquely contributes to privacy research within the literature by providing the first census representative survey-based study to understand privacy concerns in these MENA countries. The work also contributes to the field's growing interest in understanding diverse populations [35], [36], [37], [38].

In the remainder of this paper, we present a literature review focusing on privacy research in non-Western contexts and privacy attitudes in the MENA. We then move to our research questions (RQs) and then the methods. We then present our results addressing each of our three RQs. Following this, we move to our discussion section, which contains key findings, implications, and limitations that need future work. We end the manuscript with our conclusion, references, and appendices.

II. REVIEW OF LITERATURE

A. PRIVACY RESEARCH IN NON-WESTERN CONTEXT

Much research on privacy emerges from Western-focused studies that often conceptualize privacy based on liberal philosophy grounded in the belief that individuals are the primary sources of values [39], [40]. However, scholars have also examined privacy regarding accessibility, inclusion, and equity by considering individual differences based on demographics and cultural diversity [41], [42]. Hofstede's cultural scale [43] suggests that the liberal mindset regarding privacy is inconsistent globally. As much SMP scholarship focuses on Western populations, resulting findings may not be appropriate for understanding privacy dynamics in other geographical spaces [35]. Studies [44], [45] show that privacy models originating from Western contexts cannot be applied wholesale for privacy conceptualization and dynamics in non-Western populations.

Studying tech workers in India, Kumaraguru and Cranor [46] found that participants reported reduced digital privacy concerns and less awareness of privacy threats than tech workers in the United States (US). Ashraf et al. [36] studied harms in online spaces in Pakistan, highlighting the need for social media platforms to better consider digital harms to individuals in countries with little to no legal reporting mechanisms for certain actions, like stalking, and also found that low social standing prevents socially vulnerable cyber-crime victims in Pakistan from coming forward to complain.

Naveed et al. [19] studied privacy perceptions and beliefs of mobile users and identified cultural, religious, and familial influences on privacy related attitudes that differ from those discussed in Western-centric research. Abokhodair et al. examined privacy beliefs and tensions in KSA [30], [31], reporting that Saudi transnationals who migrate from KSA to the US and back again forge a conceptualization of privacy based on cultural values and priorities in both countries, along with a strong impact of gender and social norms stemming from family and society. Martin et al. [47] found that predictors of digital privacy concerns in Western models were not associated with fear of digital surveillance by governments and companies among respondents in five Arab countries.

These studies highlight the impact of culture on privacy attitudes based on a contradiction with models and systems originating from Western organizations [35]. Findings depict

privacy as a contextual, temporal, and audience-dependent construct built socially and culturally. This conceptualization differs from the liberal philosophy prevalent in Western cultures. Outside of these and a few other studies, privacy is typically considered an individual concept in Western contexts, supporting further exploration in privacy studies in non-Western regions such as MENA.

B. PRIVACY ATTITUDES IN THE MENA REGION

The MENA region consists of countries stretching from the Arabian Sea to the Atlantic Ocean [48]. Some of these countries are wealthy and are among the world's leading energy exporters. According to the World Bank, the MENA region has about 500 million people and is home to 3.4 billion people by 2050 [49].

Statistics indicate a rising trend of social media use in the MENA region [50], and social media has positively impacted the region's economy [51]. Yet, privacy concerns have been identified as one of the major inhibitors of social media adoption, including in MENA countries [4]. In 2019, one in six nationals in seven Arab countries—KSA, Egypt, Tunisia, Lebanon, Jordan, Qatar, and UAE—said they had discontinued using one or more social media services due to privacy concerns. Sizable shares of respondents also said they had bolstered their digital privacy by altering their privacy settings (41%), posting less often (33%), posting less sensitive information/fewer opinions (33%), reducing their number of social media connections (30%), or changing a social media handle to a pseudonym (19%) [50]. Respondents in that study were asked to list the social media platform that affords the most privacy, and more respondents listed WhatsApp than any other platform (except in Tunisia, though only 13% of Tunisians were using WhatsApp when that question was asked in 2019, while the rate ranged from 64%-95% in the other six countries). Notably, in response to the question of which platform offers the most privacy, a sizable proportion of respondents said that no social media platform provides more privacy protections than others—from a low of 6% in Qatar to 34% in Tunisia.

Prior research indicates that various factors, including social norms, individual characteristics, and community dynamics, play significant roles in attitudes toward privacy [52]. In Arab countries, researchers have found that gender, age, and progressive/conservative ideology—factors found to affect attitudes about digital privacy in some Western countries—were not significant predictors of concerns about digital surveillance among respondents in KSA, Qatar, UAE, Lebanon, and Tunisia. Despite presumptions about how respondents may fear digital surveillance in autocratic countries, nationals in the five Arab countries were more worried about companies than governments monitoring their online activity. Expatriates—an important population element in the MENA region—in the countries, however, were more concerned about *governments* monitoring their online behaviors [47].

In a study of nationals and expatriates in Qatar and the UAE, Qataris and Emiratis were less concerned about digital privacy threats than Indians and Pakistanis living in the two countries [53]. Research has found that the measures used to assess culture in cross-country studies are invariant across countries in many cases. At the same time, variables measuring culture affect attitudes about privacy-related constructs differently in many countries [54]. In the Arab region, though, the desire for increased cultural preservation consistently predicted support for internet regulation among national samples from KSA, Qatar, and the UAE [55]. Subsequent research has found that 'greater internet regulation' to respondents in the same and additional Arab countries means increased privacy protections for internet users [50], even though some of the measures of culture differed dramatically across the three Gulf countries; for example, just 6% of Qataris agreed that Hollywood films are good for morality, while 28% percent of Saudis and 13% of Emiratis agreed.

Religion, language, and norms are important in shaping MENA attitudes, especially about privacy [19], [31], [36]; While privacy is often regarded as an individual, rather than a communal, matter [56], in MENA countries, especially in the Arab Gulf, the concept of privacy differs due to religious and cultural distinctiveness. Culturally in the MENA, "the basic idea of the *self* and *the group* is conceptualized such that asserting one's individuality is viewed in a negative light" [31]. Most MENA countries are Muslim-majority, where the Quran and Sunnah, the examples of the Prophet Muhammad (PBUH), govern daily life. These sources acknowledge privacy in Muslim's daily lives, further connecting it to notions of modesty [57]. These distinctive features, in terms of culture and religion, require examining privacy conceptualizations and their connection with social media use, which is often a public-facing behavior. Understanding current SMP research in the MENA is important to developing regional social media designs and policies.

C. LIMITED CROSS-COUNTRY STUDIES IN PRIVACY

Researchers often initiate cross-country privacy perceptions and behaviors by acknowledging users' diversity. Trepte et al. [11] found significant differences in 'privacy calculus' between users from Germany, the Netherlands, the UK, the US, and China. Another comparative study [58] found higher smartphone privacy concerns among Germans and Japanese than American, Australian, British, Canadian, Dutch, and Italian users. Differences in privacy risks among social media users in Germany, Singapore, and the US [59] and privacy management were found among social media users in the US, Singapore, and South Korea [60].

A study involving Arab countries [61] found significant differences in privacy concerns and privacy behaviors among Emirati and British Facebook users. A study comparing privacy concerns of Saudi and Indian WhatsApp users found significantly higher concerns among Saudis [26]. Another study from the UK, the US, Canada, Malaysia, South Africa,

Turkey, and the UAE encouraged country-specific measures to address global cybersecurity issues such as cyberbullying [62]. While significant privacy-related differences are evident in cross-country studies due to cultural diversity, comparative studies involving countries with similar cultures, such as in the MENA countries, would further discern the role of culture in privacy research.

III. RESEARCH QUESTIONS

To examine SMP concerns of MENA social media users, we pose three RQs:

RQ1: *What are the privacy concerns of social media users in the MENA region?*

RQ2: *To what extent do social media privacy concerns differ among the MENA countries?*

RQ3: *To what extent do demographic factors such as gender, age, educational level, and nationality affect privacy concerns in the MENA region?*

To address these RQs, we conducted a census representative survey through a renowned survey service provider with a global randomized panel of online users.

Our work makes four unique contributions to literature.

First, we conducted a census representative survey in 16 countries with non-Western populations to study SMP concerns in the MENA region. *Second*, we expand insights into SMP concerns beyond those related to service providers and social interaction, two of the most often studied privacy concerns in the literatures [63], [64], [65], and [66], and examined privacy concerns related to regulators, such as governments. *Third*, we analyzed SMP concerns hierarchically at the subregion (North Africa, Levant, and Gulf) level, country level, and within each country. *Fourth*, we examined relationships between social media user factors like gender, age, and education and three privacy concerns dimensions: concerns related to social media service providers, social interactions, and regulatory privacy concerns.

IV. METHOD

A. DATA COLLECTION

We used an online survey to collect a census representative sample from 16 MENA countries: Algeria, Bahrain, Egypt, Iraq, Jordan, KSA, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Syria, Tunisia, UAE, and Yemen, to investigate users' SMP concerns and factors influencing such perceptions. To ensure the survey's robustness and generalizability, it was designed to be representative of populations in each country in terms of gender and age and, where possible, education. A survey firm, TGM[1] was engaged for the data collection.

It is crucial to consider the cultural and religious factors influencing attitudes toward online privacy [67], [68], as the diverse political [69], [70] and socio-economic [71] landscapes across these countries further contribute to the complexity of the topic. We selected 16 countries because, despite their differences, they share similar cultures and languages; no other region in the world, for example, has 16 countries with the same official language. Due to volatility in Syria, we could not secure a data collection partner. Iran and Israel were excluded due to the heterogeneity of their language, culture, and political landscapes.

The research team extensively piloted tested the instrument internally and to convenience samples. Then, a pilot test was done with a handful of MENA social media users. A soft launch pilot was conducted in one country of more than 100 users, allowing for statistical analysis, and then a soft launch pilot was conducted in each of the 16 countries to evaluate questionnaire items' clarity, comprehensibility, and relevance. The pretest involved a small sample of respondents from diverse backgrounds who provided feedback on potential issues or ambiguities. Necessary adjustments were made to enhance the questionnaire's efficiency, effectiveness, and appropriateness at each iteration. After this extensive piloting, we administered the survey on a full scale across all 16 counties. Data were collected from May to June 2023.

Participants were registered with TGM to take surveys, and they were financially compensated depending on the length and type of survey, with compensation above minimum wage in the US. No personal information about participants was asked. Overall, 75.7% of responses were completed in Arabic and 24.3% in the English version.

B. QUESTIONNAIRE DESIGN

A comprehensive questionnaire was developed to address the research objectives and gather relevant data on SMP concerns. The questionnaire was drafted in English and translated into Arabic, the primary language in the MENA region. To ensure accuracy and consistency, a rigorous back-translation method was adopted [72]. A few minor wording differences were identified and addressed during this process.

To establish the content and face validity of the questionnaire, we conducted a thorough literature review to identify key themes and items relevant to the region's specific context, including the incorporation of preexisting instruments, as discussed below. Additionally, we engaged a panel of subject matter experts, including scholars and practitioners in social media, privacy, and cultural studies, who reviewed and refined the instrument. The experts' feedback was incorporated into the final version of the questionnaire, ensuring they accurately reflect the cultural and social nuances of privacy concerns in the MENA. This expert review also established face validity for our survey, in conjunction with the extensive pretesting and pilot testing as discussed above.

The questionnaire started with information detailing the purpose of the study, the voluntary nature of participation, and the confidentiality of the responses. An informed consent prompt was then provided. Only participants who gave their consent were shown the questions. The questionnaire began with questions about the internet and social media use, followed by questions about privacy concerns. The

[1] https://tgmresearch.com

items measuring concerns were presented in random order to minimize order bias. We also inserted two attention-check questions to enhance response quality. TGM also applies quality checks to identify and remove participants.

C. MEASURES

We used single and multiple-item measures in this study.

1) INTERNET AND SOCIAL MEDIA USE

The *internet and social media use* were measured temporally, with the question: During a typical day, approximately how many hours do you spend using the internet? Respondents could select between less than 1 hour and up to 24 hours. Time spent on social media was measured by replacing 'using the internet' with 'on social media'.

2) PRIVACY CONCERNS

Privacy concerns were measured in terms of concerns due to service providers, social interaction, and regulators. The selection of service providers, social interaction, and regulators as dimensions for measuring privacy concerns is grounded in the unique sociocultural and political landscape of the MENA region. These dimensions were informed by literature from the MENA region; see Appendix A, which provides a comprehensive view of the multifaceted nature of privacy concerns in the MENA region, encompassing technological, social, and political aspects.

Service provider concerns are a critical dimension [73], [74], [75] due to their increasing role in data collection and management, raising concerns about data misuse, security, and commercial exploitation. Five items, adapted from [76], were used for measuring service provider concerns.

Social interaction concerns as a dimension [16], [68], [77] reflects the cultural nuances of the MENA region, where social norms and community perceptions significantly influence individual behavior and concerns about personal information being shared within one's social network. We adapted five items from existing literature (for example, [76]) to measure social interaction concerns.

Regulators related concerns [16], [17] are included due to regulatory frameworks and government surveillance across MENA countries, which affect citizens' concerns about privacy, particularly how governments monitor and use their data. Due to the non-availability of a scale measuring *regulatory privacy concerns*, we self-developed the scale, which was informed by a literature review on privacy concerns in the MENA region (see Appendix A). We began with a focused review of the literature on regulatory privacy concern [16], [17], to define and conceptualize this construct in the context of the region's unique political landscape, including prior research on support for increased internet regulation among populations in Arab countries [55]. Regulatory privacy considerations are both a topic in extant scientific literature and a pervasive concern for respondents in several MENA countries. From this review, we developed a scale of four items reflecting concerns about data protection laws and government surveillance, ensuring the items were culturally and contextually relevant.

As with all measures, these 14 items were pilot-tested to ensure further clarity and reliability. We assessed these items, considering human-computer interaction [78], privacy [79], and MENA culture [80] research for validity and relevance before pilot testing with experts. Items for all three scales are shown in Figure 1 and were measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). We also provided open-ended questions to let respondents add any additional concerns. Only a handful of respondents used this, and we did not identify any new privacy concerns outside those already mentioned in the 14 items.

3) DEMOGRAPHICS

We asked *demographic* questions about gender, age, educational level, and nationality. The survey firm TGM automatically recorded the respondents' country.

D. SAMPLE

A multi-stage stratified sampling technique was employed to select participants from each of the 16 countries. TGM collaborated with local partners in each country to establish appropriate sampling frames that accurately represented the population in terms of gender and age group. Random sampling was employed at each stage. Each country's sample size was determined to represent the target population. A sample size of n = 500 per country afforded a reasonable margin of error for a percentage/proportion reported from a given country: approximately +/−4 percentage points, calculated $1/\sqrt{n}$ [81]. This sample size balances precision, resource constraints, and the need to represent demographic diversity, including gender, age, and expat status.

Among the usable sample of 8,140 respondents, 61.5% were males, 70% were local (i.e., nationals), and 69% had a university degree. The sample had a mean age of 32.74 years (SD = 10.67) with a minimum of 18 and a maximum of 64. As many MENA countries have large expat populations, including residents who have lived in the countries for generations, it is important to include these population segments. Overall, participants from MENA countries reported spending an average of 6.71 hours (SD = 3.86) online and 3.77 hours (SD = 3.05) on social media. The sample characteristics are provided in Table 1.

E. DATA ANALYSIS

Following data collection, comprehensive data cleaning was done to remove incomplete or inconsistent responses. We commenced analyses by running confirmatory factor analysis (CFA) to check the validity of privacy concerns measures in SmartPLS 4.09. We examined model fit indices, including RMSEA, SRMR, CFI, and TLI. We also examined item loadings, composite reliability, and AVE to confirm the validity and reliability of the privacy concerns measures. Model fit indices are provided in Table B1 in Appendix B.

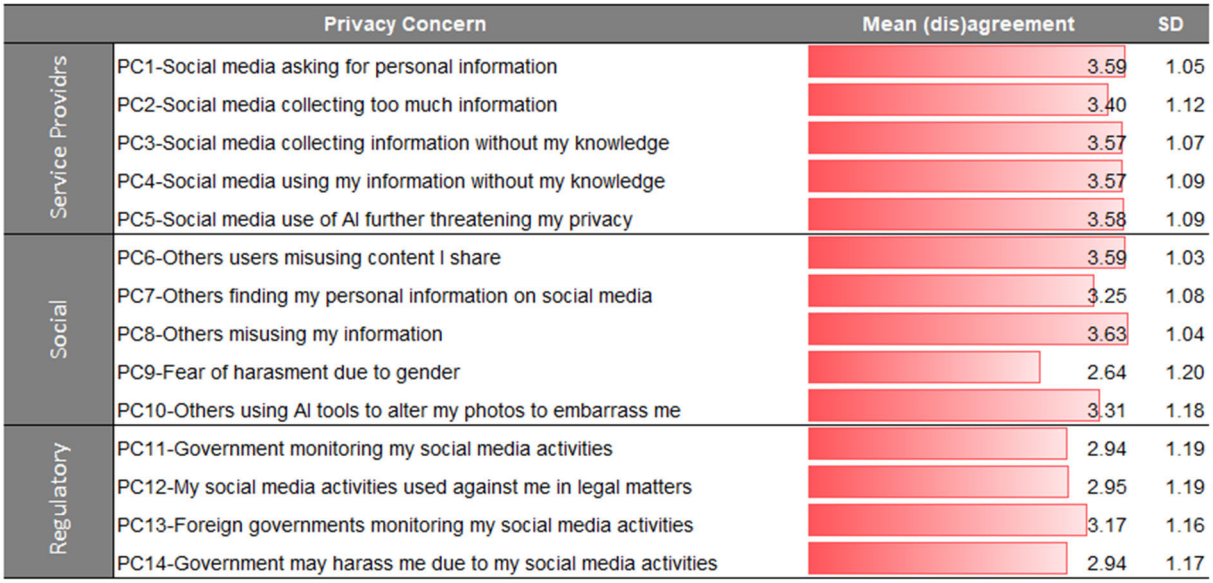

FIGURE 1. Mean (dis)agreement on 14 privacy concerns divided into three dimensions: service providers, social, and regulatory.

TABLE 1. Sub-samples, gender distribution, nationality, and educational level of respondents across 16 MENA countries (N = 8140).

Countries	Total	Male		Female		Age		Local		Expats		University Degree	
	n	n	%	n	%	M	SD	n	%	n	%	n	%
Algeria	551	289	52%	262	48%	37.27	12.15	522	95%	29	5%	423	77%
Egypt	522	277	53%	245	47%	30.11	8.87	500	96%	22	4%	453	87%
Libya[a]	486	351	72%	135	28%	36.38	12.51	375	77%	111	23%	252	52%
Morocco	530	280	53%	250	47%	26.84	8.24	487	92%	43	8%	337	64%
Tunisia	574	314	55%	260	45%	33.27	11.32	518	90%	56	10%	439	76%
Iraq[a]	526	344	65%	182	35%	31.15	8.99	415	79%	111	21%	314	60%
Jordan	580	316	54%	264	46%	33.41	11.00	502	87%	78	13%	440	76%
Lebanon	485	255	53%	230	47%	27.69	8.31	374	77%	111	23%	328	68%
Palestine[a]	486	322	66%	164	34%	36.77	12.35	428	88%	58	12%	339	70%
Bahrain	453	255	56%	198	44%	30.60	8.42	228	50%	225	50%	288	64%
Kuwait	459	269	59%	190	41%	32.65	8.34	187	41%	272	59%	320	70%
Oman	471	272	58%	199	42%	36.38	10.32	220	47%	251	53%	323	69%
Qatar	489	337	69%	152	31%	35.09	11.34	149	30%	340	70%	348	71%
Saudi Arabia	521	320	61%	201	39%	35.78	9.80	284	55%	237	45%	389	75%
UAE	479	344	72%	135	28%	29.75	8.27	53	11%	426	89%	373	78%
Yemen[a]	528	469	89%	59	11%	29.06	9.21	473	90%	55	10%	289	55%
Total	**8140**	**5014**	**61%**	**3126**	**39%**	**32.74**	**10.67**	**5715**	**70%**	**2425**	**30%**	**5655**	**69%**

[a] Note: Due to these countries' volatile situation, it was impossible to ascertain the true census data. This is also reflected in the gender distribution. However, we made all the efforts possible to collect equal samples in terms of gender.

Overall, the RMSEA, SRMR, CFI, and TLI were within acceptable thresholds [82]. We checked item loadings of all three dimensions in 16 countries and found their loading significantly on respective constructs. The items against each privacy concern dimension shown in Figure 1, significantly loaded ($p < 0.05$) on corresponding dimensions without any cross-loading [83]. The alpha, composite reliability (CR), and AVE values for all three dimensions across 16 countries are in Table B2 in Appendix B. Generally, alpha and CR of 0.6 and AVE of 0.5 or higher are desirable for confirming reliability and validity [84]. However, given AVE is a conservative measure of validity, an AVE value less than 0.5 with CR 0.6 is considered sufficient to establish the validity of constructs [85], [86]. In our case, alpha and CR were above the required thresholds, while in some cases, AVE was less than 0.5. Dropping items did not improve AVE either. Therefore, in line with the aforementioned suggestions [85], [86], we considered the reliability and validity of the constructs established. We also tested measurement invariance across the 16 countries, which is in line with [54].

After establishing construct reliability, validity, and invariance, we ran a bivariate analysis on the whole dataset to sense the relationships between user factors and privacy concerns. Table B3 in Appendix B shows significant relationships between most factors (gender, age, educational level, country, status in country, internet use, and social media use) with all three dimensions of privacy concerns (shaded grey). These results hinted at significant differences in privacy concerns in different groups, which we then explored using t-tests, ANOVA, and Pearson correlations. All statistical tests are described in the following section.

V. RESULTS

In the following section, we describe results based on the RQs.

A. RQ1: WHAT ARE THE PRIVACY CONCERNS OF SOCIAL MEDIA USERS IN THE MENA REGION?

To answer the first RQ, we asked participants their degree of (dis)agreement on 14 privacy concerns. For analysis, we examined privacy concerns at three levels: (1) individual privacy concerns, (2) privacy concerns dimensions, and (3) overall privacy concerns at the country level.

The 14 privacy concerns reflect the multifaceted nature of online privacy in the MENA, as described in the Measures section of Methods. Figure 1 shows mean and standard deviations for (dis)agreement on individual privacy concerns. The greatest privacy concern related to social interaction (*PC8-Others misusing my information*), followed by a concern pertaining to service providers (*PC1-social media asking for personal information*). Respondents' greatest regulatory concern was worry about foreign governments monitoring their social media activities.

In terms of privacy concerns dimensions, the mean concern for service providers, social interaction, and regulators were 3.54 (SD = 0.84), 3.29 (SD = 0.72), and 2.93 (SD = 0.92), respectively, showing higher concerns related to service providers, followed by privacy concerns due to social interaction and the lowest for regulatory privacy concerns. We compared overall privacy concerns among all countries by computing a grand mean of all 14 concerns. The reliability coefficient for overall privacy concerns was 0.85. Respondents in Qatar showed the highest concern with a mean of 3.43 (SD = 0.60), followed by Tunisia (M = 3.39, SD = 0.64) and Oman (M = 3.38, SD = 0.65). Yemen (M = 3.10, SD = 0.74), Libya (M = 3.13, SD = 0.73), and Iraq (M = 3.16, SD = 074) showed the lowest concerns. Figure 2 shows overall social media privacy concerns, computed by averaging three dimensions of concerns for all countries.

B. RQ2: TO WHAT EXTENT DO SOCIAL MEDIA PRIVACY CONCERNS DIFFER AMONG THE MENA COUNTRIES?

To answer the second RQ, we examined the differences at two levels: (1) overall SMP concerns across the countries and (2) differences in SMP concerns dimensions (SM service providers, social, and regulatory) among the 16 countries. Additionally, we examined the differences in privacy concerns among North African, Levant, and Gulf region countries.

1) COUNTRY-LEVEL DIFFERENCES

We conducted a One-Way ANOVA to identify significant differences (at $p < 0.05$) between countries. As shown in Table 2, some patterns emerged. Across the 16 countries, Iraq, Libya, and Yemen showed significantly *lower* privacy concerns than others, whereas Egypt, Oman, Qatar, and Tunisia showed significantly *higher* privacy concerns than other nations. Certain countries showed *similar* privacy concerns patterns, for example (see Table 2), in North Africa, Egypt, and Tunisia (highlighted green); in the Levant, Jordan and Lebanon (orange). In contrast, in the Gulf, two groups emerged: Oman and Qatar (grey), and Bahrain, KSA, and Kuwait (yellow). Across the regions, Egypt, Oman, Qatar, and Tunisia showed the same privacy concerns patterns.

2) SMP CONCERNS DIMENSIONS DIFFERENCES

We conducted an ANOVA analysis to compare single privacy dimensions across 16 countries (see Figure 3a) and t-tests to compare privacy concerns dimensions within each country (see Figure 3b). There were significant differences among all three privacy concerns dimensions across 16 countries ($p < 0.001$).

The greatest service provider concerns were in Qatar (M = 3.71), whereas the lowest was in Yemen (M = 3.30). For social privacy, the greatest concerns were reported by respondents from Egypt (M = 3.44) and the lowest by those in Yemen (M = 3.11). The greatest regulatory concerns were in Oman (M = 3.14) and the lowest in Jordan (M = 2.79). Furthermore, in all 16 countries, significant differences between privacy concerns dimensions were found, with concerns about service providers the greatest and regulatory concerns the lowest ($p < 0.01$).

3) PRIVACY CONCERNS IN NORTH AFRICA

Regarding service providers' concerns, North African countries were ranked as: Tunisia (M = 3.67, SD = 0.81), Egypt (M = 3.62, SD = 0.89), Morocco (M = 3.54, SD = 0.87), Algeria (M = 3.50, SD = 0.83), and Libya (M = 3.34, SD = 0.93). One-way ANOVA indicated that Tunisians showed significantly *greater* service provider privacy concerns than Libyans ($p < 0.001$), Algerians ($p = 0.002$), and Moroccans ($p = 0.03$); Egyptians showed *greater* concern than Libyans ($p < 0.001$) and Algerian ($p = 0.004$); and Moroccans evinced *greater* concern than Libyan ($p < 0.001$). The remaining dyads were statistically insignificant.

Within social privacy concerns, countries ranked as follows: Egypt (M = 3.44, SD = 0.71), Tunisia (M = 3.39, SD = 0.67), Morocco (M = 3.35, SD = 0.70), Algeria (M = 3.26, SD = 0.71), and Libya (M = 3.18, SD = 0.75). The ANOVA found that respondents in Egypt reported *greater* social privacy concerns than those in Libya ($p < 0.001$),

FIGURE 2. Geographical map of MENA countries in the study showing their overall privacy concerns levels. Darker color depicts higher privacy concerns. Note: please read the endnote.

TABLE 2. Overall privacy concerns differences (I-J) among 16 MENA countries (N = 8140). ▼shows significantly lower concern, ▲shows significantly higher concern, empty cells indicate no difference between two countries (at $p < 0.05$).

Regions	Countries with mean privacy concerns		Algeria	Egypt	Libya	Morocco	Tunisia	Iraq	Jordan	Lebanon	Palestine	Bahrain	Kuwait	Oman	Qatar	KSA	UAE	Yemen
North Africa	Algeria	(3.22)	0	▼	▲		▼				▼			▼	▼		▼	▲
	Egypt	(3.38)	▲	0	▲	▲		▲	▲	▲		▲	▲			▲		▲
	Libya	(3.13)	▼	▼	0	▼	▼		▼	▼	▼	▼	▼	▼	▼	▼	▼	
	Morocco	(3.29)		▼	▲	0	▼	▲							▼			▲
	Tunisia	(3.39)	▲		▲	▲	0	▲	▲	▲		▲	▲			▲		▲
Levant	Iraq	(3.16)		▼		▼	▼	0		▼	▼	▼	▼	▼	▼	▼	▼	
	Jordan	(3.22)		▼	▲		▼		0		▼			▼	▼		▼	▲
	Lebanon	(3.27)		▼	▲		▼	▲		0				▼	▼			▲
	Palestine	(3.32)	▲		▲			▲	▲		0				▼			▲
Gulf	Bahrain	(3.26)		▼	▲		▼	▲				0		▼	▼			▲
	Kuwait	(3.26)		▼	▲		▼	▲					0	▼	▼		▼	▲
	Oman	(3.26)	▲		▲			▲	▲	▲		▲	▲	0		▲		▲
	Qatar	(3.43)	▲		▲	▲		▲	▲	▲	▲	▲	▲		0	▲		▲
	KSA	(3.26)		▼	▲		▼	▲						▼	▼	0		▲
	UAE	(3.35)	▲		▲			▲	▲				▲				0	▲
	Yemen	(3.10)	▼	▼		▼	▼		▼	▼	▼	▼	▼	▼	▼	▼	▼	0

and Algerians ($p < 0.001$); Tunisians showed *higher* than Libyans ($p < 0.001$) and Algerians ($p = 0.002$); and Moroccans were *more concerned* than Libyans ($p < 0.001$), and Algerians ($p = 0.03$). The rest of the combinations were statistically insignificant.

On regulatory privacy concerns, the North African countries ranked as follows: Tunisia ($M = 3.05$, $SD = 0.90$), Egypt ($M = 3.01$, $SD = 0.99$), Morocco ($M = 2.90$, $SD = 0.88$), Algeria ($M = 281$, $SD = 0.91$), and Libya ($M = 2.80$, $SD = 0.89$).

The ANOVA indicated that Tunisians showed significantly *higher* regulatory privacy concerns than Libyans ($p < 0.001$), Algerians ($p < 0.001$), and Moroccans ($p = 0.006$). Egypt's participants showed *greater* concerns than Libya's ($p < 0.001$), Algeria's ($p < 0.001$) and Morocco's ($p = 0.04$). In North Africa, the *greatest* service provider and regulatory concerns were among respondents in Tunisia, while respondents in Egypt showed the *greatest* social privacy concerns. Libya featured the *lowest* concern on all three dimensions.

Country	Service Provider	Social	Regulators
Algeria	3.50	3.26	2.81
Egypt	3.62	3.44	3.01
Libya	3.34	3.18	2.80
Morocco	3.54	3.35	2.90
Tunisia	3.67	3.39	3.05
Iraq	3.34	3.15	2.96
Jordan	3.51	3.28	2.79
Lebanon	3.56	3.28	2.90
Palestine	3.61	3.33	2.96
Bahrain	3.58	3.23	2.90
Kuwait	3.53	3.24	2.94
Oman	3.63	3.36	3.07
Qatar	3.71	3.38	3.14
KSA	3.57	3.30	2.84
UAE	3.66	3.30	3.01
Yemen	3.30	3.11	2.83
F	*10.64*	*8.66*	*6.67*
p	*<0.001*	*<0.001*	*<0.001*

(a)

Country	Service Provider	Social	Regulators	*f*	*p*
Algeria	3.50	3.26	2.81	*103.49*	*<0.01*
Egypt	3.62	3.44	3.01	*65.79*	*<0.01*
Libya	3.34	3.18	2.80	*50.05*	*<0.01*
Morocco	3.55	3.35	2.90	*87.86*	*<0.01*
Tunisia	3.66	3.39	3.05	*86.89*	*<0.01*
Iraq	3.34	3.15	2.96	*25.09*	*<0.01*
Jordan	3.51	3.28	2.79	*105.81*	*<0.01*
Lebanon	3.56	3.28	2.90	*96.08*	*<0.01*
Palestine	3.61	3.33	2.96	*69.57*	*<0.01*
Bahrain	3.58	3.23	2.90	*84.03*	*<0.01*
Kuwait	3.53	3.24	2.94	*59.12*	*<0.01*
Oman	3.63	3.36	3.07	*59.47*	*<0.01*
Qatar	3.71	3.38	3.14	*77.75*	*<0.01*
KSA	3.57	3.30	2.84	*87.22*	*<0.01*
UAE	3.66	3.30	3.01	*99.81*	*<0.01*
Yemen	3.30	3.11	2.83	*37.16*	*<0.01*

(b)

FIGURE 3. Differences in privacy concern dimensions (a) between and (b) within countries.

4) PRIVACY CONCERNS IN LEVANT

In terms of service providers' privacy concerns, Levantine countries ranked as follows: Palestine (M = 3.61, SD = 0.87), Lebanon (M = 3.56, SD = 0.76), Jordan (M = 3.51, SD = 0.87), and Iraq (M = 3.34, SD = 0.88). One-Way ANOVA indicated that Palestinian participants reported *greater* service provider privacy concerns than those in Iraq ($p = <0.001$), and Lebanese and Jordanian participants had *greater* service provider-related privacy concerns than Iraqis ($p < 0.001$).

For social privacy concerns, Levantine countries ranked as follows: Palestine (M = 3.33, SD = 0.71), Lebanon (M = 3.28, SD = 0.64), Jordan (M = 3.28, SD = 0.73), and Iraq (M = 3.15, SD = 0.77). One-way ANOVA indicated that participants from Jordan, Lebanon, and Palestine held significantly *higher* social privacy concerns than those from Iraq ($p < 0.05$). The remaining comparisons were non-significant.

On regulatory privacy concerns, Levantine countries ranked as follows: Palestine (M = 2.96, SD = 0.95), Iraq (M = 2.96, SD = 0.95), Lebanon (M = 2.90, SD = 0.84), and Jordan (M = 2.79 SD = 0.93). One-Way ANOVA indicated that only participants from Iraq and Palestine reported significantly *greater* regulatory privacy concerns than those from Jordan ($p < 0.05$). The remaining comparisons were non-significant.

In the Levant, Palestinians showed the *greatest* privacy concerns for all three dimensions. Respondents in Iraq showed the *lowest* service provider and social privacy concerns; for regulatory privacy concerns, Jordan provided the *lowest* score.

5) PRIVACY CONCERNS IN THE GULF

On service providers privacy concerns, Gulf countries ranked as follows: Qatar (M = 3.71, SD = 0.68), UAE (M = 3.66, SD = 0.72), Oman (M = 3.63, SD = 0.76), Bahrain (M = 3.58, SD = 0.76), KSA (M = 3.57, SD = 0.84), Kuwait (M = 3.53, SD = 0.83), and Yemen (M = 3.30, SD = 0.94). One-way ANOVA indicated that participants from all Gulf countries showed significantly *greater* service provider concerns than those in Yemen ($p < 0.05$). In addition, respondents in Qatar showed significantly *greater* concerns than those in Bahrain and KSA ($p < 0.05$); and UAE-based respondents had *greater* concerns than those in Kuwait ($p < 0.05$).

On social privacy concerns, Gulf countries ranked as follows: Qatar (M = 3.38, SD = 0.61), Oman (M = 3.36, SD = 0.69), UAE (M = 3.30, SD = 0.62), KSA (M = 3.30, SD = 0.74), Kuwait (M = 3.24, SD = 0.74), Bahrain (M = 3.23, SD = 0.73), and Yemen (M = 3.11, SD = 0.74). The ANOVA indicated that participants from all Gulf countries reported significantly *greater* social privacy concerns than those in Yemen ($p < 0.05$). In addition, Qatar-based respondents reported significantly *greater* concerns than those from Bahrain, KSA, and Kuwait ($p < 0.05$); respondents in Oman registered *greater* concerns than those in Bahrain and Kuwait ($p < 0.05$).

Regarding regulatory privacy concerns, Gulf countries ranked as follows: Qatar (M = 3.14, SD = 0.84), Oman (M = 3.07, SD = 0.90), UAE (M = 3.01, SD = 0.85), Kuwait (M = 2.94, SD = 0.89), Bahrain (M = 2.90, SD = 0.84), KSA (M = 2.84, SD = 1.00), and Yemen (M = 2.83, SD =

0.92). The ANOVA indicated that participants from countries such as Oman, Qatar, and UAE held significantly *greater* regulatory privacy concerns than those in Yemen ($p < 0.05$). In addition, Qatar residents showed significantly *greater* concerns than those in Bahrain, KSA, Kuwait, and UAE ($p < 0.05$); Omanis showed *higher* concerns than Bahrainis, Kuwaitis, and Saudis ($p < 0.05$); and Emiratis *higher* than Saudis ($p < 0.05$).

C. RQ3: TO WHAT EXTENT DO DEMOGRAPHIC FACTORS SUCH AS GENDER, AGE, EDUCATIONAL LEVEL, AND NATIONALITY AFFECT PRIVACY CONCERNS IN THE MENA REGION?

The third RQ was to understand the extent to which demographic factors such as gender, age, educational level, and nationality affect privacy concerns in the MENA countries. The results are provided in the following sub-sections.

1) GENDER DIFFERENCES IN PRIVACY CONCERNS

A series of t-tests were conducted to examine gender differences. Figure 4 shows gender differences in privacy concerns related to (a) service providers, (b) social privacy concerns, and (c) regulatory privacy concerns. No significant difference between genders was found in North African countries. In the Levant, only women in Jordan reported *greater* privacy concerns than males. In the Gulf, women in Bahrain and Oman reported *greater* SM provider concerns than did men. Women in Egypt and Tunisia registered significantly *greater* concerns than their male counterparts. In all Levant countries, women reported *greater* concerns than men did. In the Gulf, only women in Bahrain and Oman showed significantly *greater* social privacy concerns than men.

Differences in regulatory privacy concerns were observed in 11 (68.8%) of 16 countries, but here men reported *greater* concerns than women. In North Africa, gender differences existed in all five countries. In the Levant, four of five countries showed a gender difference, and in the Gulf, gender differences were observed among participants in Qatar, KSA, and Yemen. Strikingly, unlike other female participants, women in Qatar held significantly *greater* regulatory privacy concerns than men.

2) AGE AND PRIVACY CONCERNS

We conducted a bivariate analysis using Pearson's correlation to examine the relationship between age and privacy concerns (see Table 3). In North Africa, age positively correlated with social privacy concerns in two countries and regulatory privacy concerns in one. In the Levant, age was positively correlated with all three dimensions of privacy concerns in Iraq and positively correlated with social and regulatory concerns in Jordan. Among Gulf countries, age was positively associated with service provider concerns, social privacy concerns in Bahrain, Kuwait, and UAE, and regulatory concerns in Kuwait and Yemen.

Table 3 indicates older participants from Bahrain, Iraq, Kuwait, and UAE had *higher* service provider concerns. In contrast, older participants from Algeria, Bahrain, Iraq, Jordan, Kuwait, Lebanon, Tunisia, and UAE showed *higher* social privacy concerns. Regarding regulatory concerns, older participants from Iraq, Jordan, Kuwait, Libya, and Yemen showed *higher* privacy concerns.

3) EDUCATIONAL LEVEL AND PRIVACY CONCERNS

We ran a bivariate analysis on education and privacy concerns (Table 4). In North Africa, education was positively correlated with service provider-related privacy concerns in Algeria and Morocco. A positive association of education on SMP concerns in Moroccan was also evident. In the Levant, participants from Jordan and Palestine with more education reported greater concerns about service providers.

Education predicted regulatory privacy concerns in Jordan and social and regulatory privacy concerns in Iraq. Participants with more formal education in all Gulf countries, except Qatar, reported *greater* service provider concerns and social privacy concerns. Education was also positively associated with regulatory privacy concerns in KSA and Yemen. In North Africa, age positively predicted social privacy concerns in Algeria and Tunisia and predicted regulatory privacy concerns in Libya. In the Levant, age was positively correlated with all three dimensions of privacy concerns in Iraq and positively correlated with social and regulatory concerns in Jordan. Older respondents in Lebanon reported *greater* concern for social privacy concerns. Among Gulf countries, age was positively associated with service provider concerns and s ocial privacy concerns in Bahrain, Kuwait, and UAE, as well as regulatory concerns in Kuwait and Yemen.

4) NATIONALITY AND PRIVACY CONCERNS

We considered expatriate segments to be important components of populations in many MENA countries, and to investigate SMP concerns adequately, these population subgroups were considered.

We conducted independent-sample t-tests for nationals and expats in countries with proportions of non-nationals $>10\%$ of the sample size (all but Morocco, Egypt, and Algeria). Means and p-values are in Table 5.

In North Africa, no significant difference was found between nationals and expats on any of the privacy concerns dimensions in Libya and Tunisia.

In the Levant, only in Iraq did nationals and expats differ; nationals reported *greater* social privacy concerns. In the Gulf, where the proportion of expats is high, non-nationals in Kuwait reported *greater* service provider and regulatory concerns. Oman also exhibited significant differences on all dimensions, though nationals reported *greater* concerns than expatriates on all three. In Qatar, expats had significantly *greater* service provider-related concerns than citizens. In KSA, a similar result was found for regulatory privacy concerns.

Country	Male	Female	p
Algeria	3.53	3.47	0.22
Egypt	3.61	3.63	0.38
Libya	3.34	3.35	0.47
Morocco	3.52	3.58	0.20
Tunisia	3.62	3.72	0.07
Iraq	3.31	3.42	0.09
Jordan	**3.44**	**3.59**	**0.02**
Lebanon	3.53	3.59	0.19
Palestine	3.57	3.67	0.11
Bahrain	**3.45**	**3.74**	**<.001**
Kuwait	3.49	3.59	0.10
Oman	**3.55**	**3.74**	**<0.01**
Qatar	**3.72**	3.68	0.22
KSA	3.55	3.60	0.24
UAE	**3.65**	**3.69**	0.32
Yemen	3.30	3.26	0.37

(a) Service Providers

Country	Male	Female	p
Algeria	3.24	3.29	0.20
Egypt	**3.37**	**3.52**	**0.01**
Libya	3.17	3.19	0.41
Morocco	3.31	3.40	0.07
Tunisia	**3.34**	**3.47**	**0.01**
Iraq	**3.09**	**3.27**	**0.01**
Jordan	**3.22**	**3.35**	**0.02**
Lebanon	**3.21**	**3.35**	**0.01**
Palestine	**3.28**	**3.43**	**0.02**
Bahrain	**3.08**	**3.42**	**<.001**
Kuwait	3.22	3.26	0.32
Oman	**3.28**	**3.47**	**<0.01**
Qatar	**3.40**	3.36	0.25
KSA	3.30	3.30	0.48
UAE	3.29	3.31	0.42
Yemen	3.10	3.14	0.36

(b) Social

Country	Male	Female	p
Algeria	**2.98**	**2.62**	**<.001**
Egypt	**3.09**	**2.93**	**0.03**
Libya	**2.85**	**2.67**	**0.02**
Morocco	**2.96**	**2.82**	**0.03**
Tunisia	**3.19**	**2.88**	**<.001**
Iraq	**3.02**	**2.83**	**0.01**
Jordan	**2.85**	**2.72**	**0.04**
Lebanon	**3.00**	**2.79**	**0.01**
Palestine	3.01	2.86	0.05
Bahrain	2.91	2.88	0.36
Kuwait	**3.00**	2.86	0.06
Oman	3.08	3.06	0.39
Qatar	**3.20**	**3.00**	**0.01**
KSA	**2.96**	**2.66**	**<.001**
UAE	3.03	2.94	0.15
Yemen	**2.88**	**2.47**	**<.001**

(c) Regulatory

FIGURE 4. Gender differences in privacy concern dimensions in 16 countries. Significant differences are bolded.

TABLE 3. Age and privacy concerns. Significant differences are bold/grey.

Countries	Service Providers	Social	Regulatory
Algeria	0.06	**0.11****	0.07
Egypt	0.03	-0.06	0.04
Libya	0.05	0.07	**.091***
Morocco	0.03	0.05	-0.02
Tunisia	0.06	**0.11****	0.06
Iraq	**0.09***	**0.11***	**0.11***
Jordan	0.05	**0.10***	**0.10***
Lebanon	0.06	**0.16****	0.06
Palestine	0.06	0.06	0.07
Bahrain	**0.10***	**0.11***	0.02
Kuwait	**0.16****	**0.18****	**0.12****
Oman	0.07	0.09	0.04
Qatar	0.03	0.06	0.06
KSA	0.00	0.01	0.01
UAE	**0.13****	**0.12****	-0.03
Yemen	0.07	0.08	**0.10***

Note: * significant at p <0.05, ** significant at p <0.01

TABLE 4. Educational level and privacy concerns. Significant differences are bold/grey.

Countries	Service Providers	Social	Regulatory
Algeria	**0.13****	0.05	0.06
Egypt	0.00	-0.01	-0.01
Libya	0.05	0.06	0.04
Morocco	**0.22****	**0.17****	0.05
Tunisia	0.02	0.01	0.00
Iraq	0.06	**0.11****	**0.10***
Jordan	**0.11****	0.06	**0.09***
Lebanon	0.07	0.08	0.08
Palestine	**0.17****	-0.01	-0.05
Bahrain	**0.11***	**0.14****	0.04
Kuwait	0.01	0.02	0.00
Oman	**0.12****	**0.13****	0.06
Qatar	0.08	0.05	0.00
KSA	**0.14****	**0.17****	**0.11***
UAE	**0.16****	**0.16****	0.03
Yemen	**0.14****	**0.10***	**0.10***

VI. DISCUSSION

A. RQ1: WHAT ARE THE PRIVACY CONCERNS OF SOCIAL MEDIA USERS IN THE MENA REGION?

Despite most social media service providers related concerns were rated the highest, two social privacy concerns were rated the highest among the top three privacy concerns. The top three privacy concerns were: *others misusing personal information* (PC-8), *other users misusing the content I share* (PC-6), and *social media asking for personal information* (PC-1). This finding shows that MENA social media users place more weight on social privacy concerns, as noted in earlier regional inquiries (see Table A1 in Appendix A for references).

B. RQ2: TO WHAT EXTENT DO SOCIAL MEDIA PRIVACY CONCERNS DIFFER AMONG THE MENA COUNTRIES?

The observed differences in privacy concerns among the 16 MENA countries invite further exploration into how cultural, socio-political, and regulatory environments shape people's social media perceptions and behaviors, which is

TABLE 5. Educational level and privacy concerns. Significant differences are bold/grey.

Countries	Service Providers			Social			Regulatory		
	National	Expat	p	National	Expat	p	National	Expat	p
Algeria	3.51	3.23	NA	3.28	2.89	NA	2.82	2.59	NA
Egypt	3.61	3.66	NA	3.45	3.33	NA	3.01	3.02	NA
Libya	3.34	3.35	0.48	3.18	3.17	0.49	2.80	2.82	0.42
Morocco	3.56	3.41	NA	3.37	3.16	NA	2.89	2.95	NA
Tunisia	3.68	3.46	0.07	3.41	3.28	0.14	3.04	3.08	0.38
Iraq	3.37	3.25	0.11	**3.20**	**2.98**	**<0.01**	2.97	2.92	0.33
Jordan	3.51	3.49	0.45	3.27	3.31	0.35	2.77	2.92	0.10
Lebanon	3.58	3.49	0.14	3.27	3.30	0.37	2.88	2.96	0.21
Palestine	3.64	3.33	0.01	3.35	3.21	0.08	2.98	2.81	0.10
Bahrain	3.58	3.58	0.46	3.20	3.26	0.20	2.86	2.94	0.15
Kuwait	**3.42**	**3.60**	**0.01**	**3.16**	**3.29**	**0.04**	**2.81**	**3.03**	**0.01**
Oman	**3.72**	**3.55**	**0.01**	**3.51**	**3.24**	**<0.001**	**3.21**	**2.94**	**<.001**
Qatar	**3.60**	**3.76**	**0.01**	3.43	3.37	0.16	3.05	3.17	0.05
KSA	3.52	3.61	0.11	3.26	3.34	0.14	**2.75**	**2.96**	**0.01**
UAE	3.68	3.66	0.42	**3.48**	**3.28**	**0.01**	**3.24**	**2.98**	**0.02**
Yemen	3.31	3.17	0.14	3.11	3.04	0.23	2.83	2.87	0.36

beyond the scope of this study. For example, given social privacy concerns exceed the other two dimensions, digital media literacy programs could better instruct social media users in Arab countries on how to better protect their information from other users, like using pseudonyms, removing geo-tags from posts, and having posts to be seen only by curated and designated groups. Also, research into the social situations of these countries would be interesting. For example, some of the high privacy concerns were among the region's most stable countries. Some of the lower privacy concerns were among countries experiencing turmoil. However, this would need to be further investigated.

Second, the study identified the highest and lowest privacy-conscious social media users in 16 MENA countries. **Qatar, Tunis, and Oman were the top three with the highest privacy concerns. In contrast, the lowest concerns were shown by Yemenis, Libyans, and Iraqis.** Service provider concerns were greatest among respondents in Qatar, Tunisia, and the UAE. Egypt, Tunisia, and Qatar participants held the greatest social privacy concerns. While regulatory privacy concerns were lower than those of service providers and social privacy concerns in all countries, Qatar, Oman, and Tunisia respondents expressed greater regulatory concerns than respondents elsewhere.

Given high levels of social media surveillance by MENA governments and frequent arrests of SM users in KSA, UAE, Egypt, and elsewhere, social media users in MENA countries may not be concerned enough.

VPNs, end-to-end encryption, pseudonymous accounts, and multi-factor authentication should be more widely encouraged. **The differences in privacy concerns within countries having shared language, culture, and social values point towards the fact that privacy may not be a national culturally specific phenomenon even in MENA countries.**

This finding matches with investigations in non-MENA contexts, for example, [54] and [87]. This also suggests future inquiries in MENA countries be based on privacy as an individual-level construct or a more nuanced measurement of horizontal and vertical individualism and collectivism [88].

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C. RQ3: TO WHAT EXTENT DO DEMOGRAPHIC FACTORS SUCH AS GENDER, AGE, EDUCATIONAL LEVEL, AND NATIONALITY AFFECT PRIVACY CONCERNS IN THE MENA REGION?

Third, the study highlights the gender differences in social media users in 16 countries. **Women reported greater privacy concerns in two out of three privacy concerns dimensions.** While women showed greater privacy concerns about service providers than men did, significant differences were only in three countries: Bahrain, Oman, and Jordan. On the other hand, on social privacy concerns, in half of the countries, women showed significantly greater concern than did men. Gender-based differences in privacy concerns, particularly pronounced in Bahrain, Oman, and Jordan, highlight

the need for gender-sensitive approaches in the MENA for understanding and addressing social media privacy. Moreover, women reported significantly lower regulatory concerns in 11 of the 16 countries. Women in MENA countries are more concerned about social privacy matters than about other privacy dimensions. Many MENA countries have conservative cultural norms and values [89], so the reason for this heightened concern may be that sharing personal information on social media can be considered a breach of modesty or family values [30], [90], [91]. Another explanation could be cyber harassment commonly experienced by women on social media [92]. The findings underscore the necessity of culturally contextualized, gender-considerate strategies in MENA social media governance to address unique challenges MENA women may face, including cyber harassment, doxxing, and stalking, and to promote safer, more respectful social media environments.

Fourth, **there were significant differences in privacy concerns among nationals and expatriates, mostly in the Gulf countries like Kuwait, Oman, Qatar, KSA, and UAE.** However, the differences were not consistent. For example, in Kuwait, expats showed significantly higher concerns than citizens in all three dimensions of privacy concerns. Similar findings were found in Qatar, where expats reported greater concerns about service providers, and in KSA, where expats had significantly greater regulatory privacy concerns than nationals. However, in Oman, nationals registered greater concerns on all three privacy dimensions. Emiratis reported significantly greater privacy scores than expats due to social interaction and regulatory concerns. The significant differences in privacy concerns between citizens and expatriates, especially in Gulf countries, with varying patterns across nations like Kuwait, Qatar, KSA, Oman, and UAE, highlight the complex interplay of cultural, legal, and social factors influencing digital privacy perceptions in some countries where expats outnumber citizens and, while many such non-nationals have resided in the countries their entire lives, they may still worry more than nationals that the government, social media platforms, or other internet users may violate their privacy.

D. IMPLICATIONS

Our findings provide detailed information about the privacy concerns of an under-researched region in the world. Given the findings, designers working on social media platforms catering to the MENA region could consider the following strategies:

1) FEEDBACK MECHANISMS

Designers should incorporate regular feedback mechanisms. This will allow them to understand evolving user needs, adapt to them, and continually refine privacy settings. These can include monitoring the ''health'' of the platform in terms of privacy concerns, as well as conducting periodic reviews (e.g., user studies or surveys). Incorporating regular feedback mechanisms allows social media platforms to stay attuned to users' evolving privacy needs and concerns, fostering continuous improvement in privacy features and user trust. For MENA social media users, this means a platform that is more responsive to their concerns, offering a safer and more personalized online experience.

2) LOCALIZED PRIVACY SETTINGS

Recognize the diverse privacy concerns across different countries. Implement settings and features that cater to specific regional preferences, ensuring that users in places like Qatar, Tunisia, and Oman have robust privacy controls reflecting their heightened concerns. Localized privacy settings catering to users' specific concerns in different MENA countries can significantly enhance user trust and comfort, ensuring that their unique cultural and regional privacy needs are respected and addressed. For social media platforms, this tailored approach can increase user engagement and loyalty by demonstrating sensitivity to and respect for the diverse privacy expectations of their MENA user base.

3) EXPATRIATE-FRIENDLY INTERFACES

Given the differences between locals and expatriates regarding privacy concerns in numerous Gulf countries, designers could consider creating expatriate-friendly interfaces. Developing expatriate-friendly interfaces that respect diverse cultural nuances can significantly enhance the user experience for expatriates in the Gulf region, making them feel more understood and secure in their online interactions. This inclusive approach can lead to broader user engagement and loyalty, as it demonstrates a commitment to catering to the diverse needs of their multicultural user base in the MENA.

4) GENDER-SENSITIVE FEATURES

Given pronounced gender disparities in privacy concerns, designers should consider introducing gender-sensitive privacy tools. This might include more granular controls for sharing content or enhanced security features to safeguard against cyber harassment. Introducing gender-sensitive privacy tools can significantly enhance the safety and comfort of female users in the MENA region by providing them with more control and protection against issues like cyber harassment. In essence, designers need to take a localized, nuanced approach that respects regional, gender, educational, and expatriate-citizen differences in privacy perceptions and concerns.

E. LIMITATIONS AND FUTURE WORK

The study has limitations, as does all research. The survey sample overrepresented respondents of higher education. This overrepresentation is obvious where data is collected through online surveys. Also, the study does not measure individual culture through self-reported measures and depends on country-level cultural metrics available from a third-party source [32]. Stemming from these limitations and the general ''room'' for expansion when understanding the

topic better, we envisage the following directions for future work. While the study relies on quantitative data, integrating qualitative methods, such as interviews or focus groups, could provide more depth. Personal anecdotes, experiences, and detailed perspectives could enrich the understanding of privacy concerns. Integrating questions about users' knowledge of their privacy settings, privacy tools, rights, and potential threats can provide insights into whether concerns stem from informed perspectives or potential misconceptions. Future work could also focus on a more detailed analysis of social media usage patterns on specific platforms, as well as exploring how different platforms may impact privacy concerns across various gender, nationality, and education groups. These should be scrutinized further in other work.

VII. CONCLUSION

The study comprehensively examines SMP concerns across 16 MENA countries, revealing distinct variations based on nationality, gender, age, and education. Significant multi-level privacy differences exist across the Gulf, Levant, and North Africa regions and among countries within these regions and individual countries based on gender, age, educational level, and expat versus national status. These results highlight the concerns and attitudes towards SMP in the MENA region and the key factors that shape these perceptions. While shared cultural and linguistic factors unify the region, nuanced differences in privacy perceptions underscore the need for tailored platform designs and user awareness initiatives. The findings align with privacy theories that emphasize privacy concerns' contextual and culturally dependent nature, highlighting the importance of localized privacy frameworks. The implications of this research can impact the development of social media platforms and policies tailored to the unique privacy concerns of MENA users. Notably, social media platforms operating in the MENA region should adopt a localized sensitive approach to address user needs and concerns comprehensively.

APPENDIX A
PREVIOUS LITERATURE ON SOCIAL MEDIA PRIVACY CONCERNS AMONG MENA COUNTRIES

To identify the social media privacy concerns in the MENA region, we examined the literature involving privacy concerns from the said region. We found a handful of studies

TABLE A1. Previous literature on social media privacy concerns among mena countries.

Source	Country	Privacy Concerns		
		Service Provider	Social	Regulatory
Aladari and Joy [96]	Bahrain		X	
Alammary [97]	Bahrain	X	X	
Khairy et al. [98]	Egypt		X	
Abdelghaffar and Samer [99]	Egypt	X		
Faisal and Alsumait [100]	Kuwait		X	
Al-Saggaf [101]	KSA	X	X	X
Mutambik et al. [102]	KSA			X
Dev et al. [26]	KSA and India	X		
Abokhodair and Hodges [93]	KSA		X	X
Alshehri [103]	KSA	X		
Almalki [104]	KSA	X		
Mutambik et al. [105]	KSA		X	
Guta and Karolak [106]	KSA		X	
Abokhobair et al., [107]	KSA and Qatar		X	
Alnsour et al, [108]	KSA		X	
AlZamel and Al-Jabri [109]	KSA		X	X
Krasnova et al. [110]	Morocco		X	
Abokhodair et al. [111]	Qatar	X	X	X
Alshare et al. [112]	Qatar		X	
Cengiz et al. [113]	Turkey and Iraq	X		
Vorakulpipat et al. [114]	UAE	X		
Barry and Bouvier [62]	UAE	X		
Semary [115]	UAE		X	
Ghandour et al. [63]	Multiple			X
Moreno-Almeida and Banaji [116]	Jordan, Morocco, Tunisia, and UAE	X	X	X
Hooda et al. [117]	Multiple MENA			X

examining privacy concerns. We analyzed these studies and found that the concerns can broadly be categorized into three dimensions.

APPENDIX B
FURTHER ANALYSIS

See Tables B1–B3.

TABLE B1. Table showing model fit indices with suggested thresholds.

Country	X2	df	P value	X^2/df	RMSEA	RMSEA LOW 90% CI	RMSEA HIGH 90% CI	SRMR	TLI	CFI
Algeria	255.656	74	0	3.455	0.07	0.06	0.08	0.05	0.91	0.93
Bahrain	230.446	74	0	3.114	0.07	0.06	0.08	0.06	0.91	0.92
Egypt	239.773	74	0	3.24	0.07	0.06	0.08	0.05	0.94	0.95
Iraq	183.87	74	0	2.485	0.05	0.04	0.06	0.05	0.94	0.96
Jordan	274.195	74	0	3.705	0.07	0.06	0.08	0.05	0.92	0.94
Kuwait	235.625	74	0	3.184	0.07	0.06	0.08	0.06	0.91	0.93
Lebanon	295.464	74	0	3.993	0.08	0.07	0.09	0.07	*0.89*	0.91
Libya	217.795	74	0	2.943	0.06	0.05	0.07	0.06	0.92	0.93
Morocco	303.413	74	0	4.1	0.08	0.07	0.09	0.06	0.91	0.92
Oman	266.281	74	0	3.598	0.07	0.07	0.08	0.06	0.90	0.91
Palestine	202.98	74	0	2.743	0.06	0.05	0.07	0.06	0.94	0.95
Qatar	272.601	74	0	3.684	0.07	0.07	0.08	0.07	0.91	0.92
Saudi Arabia	327.312	74	0	4.423	0.08	0.07	0.09	0.07	0.91	0.92
Tunisia	180.863	74	0	2.444	0.05	0.04	0.06	0.05	0.95	0.96
UAE	283.333	74	0	3.829	0.08	0.07	0.09	0.07	0.89	0.91
Thresholds			>0.05	3 or less	.05-.10			<0.09	>0.90	>0.90
Thresholds Sources			[85]	[85]	[85]			[85]	[85]	[85]

Note: Usually a non-significant chi-square (X^2) is desired, however, in practice, this hardly happens. Therefore, it is suggested to look at measures such as RMSEA, SRMR, TLI, and CFI.

TABLE B2. Table showing model fit indices with suggested thresholds.

Country	Service Provider			Social Interaction			Regulatory		
	α	CR	AVE	α	CR	AVE	α	CR	AVE
Algeria	0.8	0.8	0.5	0.7	0.7	*0.3*	0.8	0.8	0.5
Bahrain	0.8	0.8	0.5	0.7	0.7	*0.3*	0.7	0.8	*0.4*
Egypt	0.9	0.9	0.6	0.7	0.7	*0.3*	0.8	0.8	0.6
Iraq	0.8	0.8	0.5	0.7	0.7	*0.3*	0.8	0.8	0.5
Jordan	0.9	0.9	0.5	0.7	0.7	*0.3*	0.8	0.8	0.5
Kuwait	0.8	0.8	0.5	0.7	0.7	*0.3*	0.8	0.8	*0.4*
Lebanon	0.8	0.8	0.5	0.6	0.6	*0.3*	0.8	0.8	0.5
Libya	0.8	0.8	0.5	0.6	0.7	*0.3*	0.7	0.7	0.4
Morocco	0.9	0.9	0.6	0.7	0.7	*0.3*	0.8	0.8	0.5
Oman	0.8	0.8	0.5	0.7	0.7	*0.3*	0.8	0.8	0.5
Palestine	0.8	0.9	0.5	0.6	0.6	*0.3*	0.8	0.8	0.5
Qatar	0.8	0.8	0.4	0.6	0.6	*0.3*	0.8	0.8	0.5
Saudi Arabia	0.8	0.8	0.5	0.7	0.7	*0.3*	0.8	0.8	0.6
Tunisia	0.8	0.8	0.5	0.6	0.6	*0.3*	0.8	0.8	0.5
UAE	0.8	0.8	0.5	0.6	0.6	*0.3*	0.8	0.8	0.5
Yemen	0.8	0.9	0.5	0.6	0.6	*0.3*	0.7	0.8	*0.4*
Threshold	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.5

Note: α: Cronbach alpha, CR: Composite Reliability, AVE: Average Variance Extracted. If AVE is less than 0.5,but composite reliability is higher than 0.6, the convergent validity of the construct can be adequate [88], [89]

TABLE B3. Sense-making through bivariate analysis of variables (N = 8140).

	1	2	3	4	5	6	7	8	9	10
1) Gender	1.00									
2) Age	-.09**	1.00								
3) Educational Level	.10**	.18**	1.00							
4) Country of Residence	-.12**	.01	-.01	1.00						
5) Status in the Country	-.04**	.02	-.03**	.16**	1.00					
6) Internet Use	.09**	-.09**	.03**	-.02*	.02*	1.00				
7) Social Media Use	.14**	-.13**	.01	-.02	.01	.70**	1.00			
8) Privacy Concerns - Service Providers	.05**	.08**	.12**	.02*	.02	.05**	0.01	1.00		
9) Privacy Concerns - Social	.08**	.10**	.10**	.01	-.02*	.07**	.06**	.66**	1.00	
10) Privacy Concerns - Regulators	-.09**	.05**	.05**	.03**	.03**	.06**	.02	.48**	.55**	1.00

Note: * p<0.05, ** p<0.01

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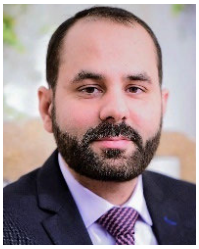
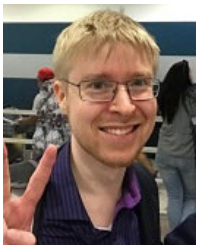


ALI FAROOQ (Senior Member, IEEE) received the D.Sc. (Tech.) degree and the M.Sc. (Tech.) degree in cybersecurity. He is currently a Lecturer with the University of Strathclyde, Scotland, and a Senior Research Fellow with Qatar Computing Research Institute, Doha, Qatar. He is a Commonwealth Executive MBA. His research interests include the intricate intersection between humans and technology, particularly in the realm of security and privacy behaviors and their effects on users' well-being. Additionally, he is passionate about exploring the potential dark side of technology and identifying ways to improve learning and engagement among current and future workforce.



JONI SALMINEN is currently a Faculty Member with the School of Marketing and Communication, University of Vaasa, Finland. He is also affiliated with Turku School of Economics, University of Turku. Previously, he was a Scientist with Qatar Computing Research Institute. His research interests include personas, human–computer interaction, online hate, user and customer segmentation, and social media platforms.

JUSTIN D. MARTIN, Ph.D., is the Eleanor Poynter Jamison Chair in Media Ethics and Press Policy and Associate Professor in the Department of Journalism and Digital Communication at the University of South Florida. He studies relationships between media use and sociopolitical attitudes. His research examines attitudes about censorship, freedom of expression, and digital surveillance. A Fulbright Scholar, Martin has lived in Jordan, Tunisia, Egypt, and Qatar, and speaks multiple dialects of Arabic.

KHOLOUD ALDOUS received the bachelor's and master's degrees in computer science from Qatar University and the Ph.D. degree in computer science and engineering from Hamad Bin Khalifa University. She is currently a Postdoctoral Researcher with Qatar Computing Research Institute. Her research interests include social media engagement and social computing.

SOON-GYO JUNG received the Bachelor of Engineering degree in computer software from Kwangwoon University, Seoul, South Korea, in 2014, and the Master of Science degree in electrical and computer engineering from Sungkyunkwan University, Suwon, South Korea, in 2016. He is currently an accomplished Software Engineer with Qatar Computing Research Institute, Doha, Qatar. With a solid background in computer science, data science, and analytics, he specializes in developing data-driven and data-intensive systems using research-oriented software engineering techniques. In addition to software engineering, he also possesses expertise in a range of roles, including software architecture, full-stack web development, data architecture, data engineering, and prototyping. This diverse skill set allows him to deliver holistic solutions that effectively address complex problems.

BERNARD J. JANSEN (Senior Member, IEEE) received the Ph.D. degree in computer science from Texas A&M University. He is currently a Principal Scientist with Qatar Computing Research Institute, Doha, Qatar. He is a West Point Graduate with Texas A&M University.