Willingness and determinants of participation in public health research: a cross-sectional study in Saudi Arabia

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Abstract

**Background:** Active participation in health research plays an integral role in the development and implementation of evidence-based health interventions and policies.

**Aims:** To assess public willingness and determinants of participation in public health research.

**Methods:** A cross-sectional survey targeting Saudi residents aged > 16 years from the 13 regions of Saudi Arabia, using computer-assisted telephone interviews. We assessed the sociodemographic of participants, participants' involvement in research, their acceptance to participate, barriers hindering their participation, and their willingness to be involved in future health research. Pearson's $\chi^2$ and logistic regression analyses were used to explore determinants.

**Results:** There were 2512 participants in this study. Three hundred and seventy one (14.8%) confirmed that they had been invited previously to participate in research studies and 271 (73%) accepted the invitation. The majority (92%, $n = 2319$) of participants were willing to participate in future research. Being a young adult, male, college-educated, and employed were the main factors associated with willingness to participate in health research. Those who had previous experience of participation in health research were 3 times more willing to participate in future health research compared with participants with no prior experience ($P < 0.001$).

**Conclusions:** This study highlighted the key determinants of willingness to participate in health research. Most participants had never been invited to participate in health research, but the majority reported a positive attitude towards participation. With rapid health system development nationally and regionally, Saudi participation levels in health research still need improvement.

Keywords: community involvement; medical research; public health; research awareness; research participation

Introduction

Active community participation in research has a positive impact on public health. Engaging community members in the research process empowers them to improve their community health (1,2). The active participation of diverse members of society in research studies ensures that the study sample is representative and the research is relevant to the needs of its target population (3). Community participation is also important for the development and implementation of evidence-based interventions and public health policy that target the community's needs (4). Moreover, public involvement in health research affects community awareness and support for science and research (5,6).

Community participation makes a valuable contribution to health research by fostering the research process and improving the generalization and enhancing the credibility of the results. Insufficient and low recruitment rates of research participants is costly because they delay study completion and increase its expense (7,8). Low research participation can lead to ineffective translation of study findings to meet the target group's needs (3). Likewise, low enrolment in research studies can lead to potential sampling bias and affect the validity of the study and generalization of the results (9,10). However, the public is still not fully aware of the value their participation in research has on enriching and improving health (9).

In Saudi Arabia, there are several challenges associated with conducting health research. One of these is associated with recruiting the target number of research participants. Most studies that investigate health issues in Saudi Arabia are small and target metropolitan cities, such as Riyadh, Jeddah and Dammam (11–15). In a Saudi national survey conducted through telephone interviews, female sample quotas in some regions were difficult to reach (16). Health and clinical studies face challenges in recruiting participants, which is due to research infrastructure, accessibility issues, and the limited number of research data resources (7,17,18).

Rapid development of the health sector and expansion of the population have increased the demand for health research (9,19). Increasing community participation and engagement in research is an integral part of the research process that contributes to health advances and improves quality of life (6,19). This study was conducted...
to assess public willingness for and sociodemographic determinants of participation in public health research.

**Methods**

**Study design**

This was a self-reported cross-sectional survey conducted between July and August 2017 among Arabic-speaking Saudi residents aged > 16 years. The survey was carried out in the 13 main regions in Saudi Arabia: Riyadh, Jeddah, Abha, Hail, Tabuk, Al-Madinah, Southern Province, Aljouf, AlQassim, Najran, Jazan, Albaha, and Northern Borders. The research was reviewed and approved by the Saudi Food and Drug Authority Ethics Committee (Ethical Approval Number: 190009). Based on the nature of the research and data collected, this study was considered a minimal-to-no-risk survey and participants aged > 16 years were considered as mature minors who were able to provide informed consent to participate. Consent was obtained from all participants prior to recruitment.

**Sampling and recruitment methods**

Participants were approached through a computer-aided telephone interview (CATI) after a telephone number list was generated from a governmental database. The study used a convenience sampling technique, in which the sample was randomly selected from the telephone numbers without a known probability of selection. Each participant received 3 call attempts before being dropped from the list. Participants were asked via a Web-based CATI to participate in the study voluntarily and verbal informed consent was obtained from all participants. The survey took approximately 10 minutes to complete. All questions had to be answered to be submitted to the CATI database. Therefore, there were no missing data in the dataset.

**Questionnaire design**

After providing verbal consent, participants were asked about their sociodemographic characteristics, such as age, sex, region of residence, education and employment status. The questionnaire consisted of 4 main components. The first part assessed participants’ involvement in research by asking them, “Have you been invited to participate in a scientific health research study in the past?” The second part assessed their acceptance to participate in research studies. The third part asked about barriers that might hinder their participation in research. The final part assessed participants’ willingness to be involved in future health research.

**Data analysis**

Frequencies and percentages with 95% confidence intervals (CIs) were used for descriptive analysis. Cross tabulations with Pearson’s χ² and logistic regression analyses were used to explore determinants of participation in research. The association was considered statistically significant if P was < 0.05. SPSS version 25 was used for analysis.

**Results**

A total of 2512 adults participated in this study from the 13 regions of Saudi Arabia; with a response rate of 89.71%. The median age of participants was 35 years (interquartile range 29–42 years), 1669 (66.4%) were male, and 1543 (61.4%) had a bachelor’s degree (Table 1).

Only 1371 (4.8%) of the sampled population had been invited previously to participate in research studies, and 271 (73%) reported that they had agreed to participate (Table 2). Most participants (92%, n = 2320) stated that they would be willing to participate in future health research studies. The factors that hindered community participation were low awareness of community participation in research (13%, n = 13), time constraints (4%, n = 4), and absence of financial incentives (4%, n = 4). Most participants (79%, n = 79) reported other factors

| Sociodemographic characteristics | Mean | Standard deviation |
|---------------------------------|------|--------------------|
| Age (years)                     | 36.34| 10.24              |
| Sex                             |      |                    |
| Male                            | 1669 | 66.4               |
| Female                          | 843  | 33.5               |
| Education                       |      |                    |
| High school education and below | 434  | 17.3               |
| Diploma education               | 163  | 6.5                |
| Bachelor education              | 1543 | 61.4               |
| Higher education                | 372  | 14.8               |
| Employment                      |      |                    |
| Employed                        | 1834 | 73                 |
| Unemployed                      | 540  | 21.5               |
| Student                         | 138  | 5.5                |
| Nationality                     |      |                    |
| Saudi                           | 1529 | 60.8               |
| Non Saudi                       | 983  | 39.1               |
| Regions                         |      |                    |
| Riyadh                          | 1352 | 53.8               |
| Makkah                          | 211  | 8.4                |
| Madinah                         | 51   | 2.0                |
| Qasim                           | 35   | 1.4                |
| Eastern Province                | 449  | 17.9               |
| Asir                            | 116  | 4.6                |
| Tabuk                           | 119  | 4.7                |
| Hail                            | 116  | 4.6                |
| Northern Borders                | 17   | 0.7                |
| Jizan                           | 14   | 0.6                |
| Najran                          | 19   | 0.8                |
| Bahah                           | 8    | 0.3                |
| Jouf                            | 5    | 0.2                |
as a barrier to their willingness to participate in health research.

After controlling for other sociodemographic factors (age, sex, education and employment), those with prior experience of research, who had participated at least once in any previous health research, were approximately 3 times more likely to be willing to participate in health research compared with participants with no prior experience (95% CI: 1.57–4.95, \( P < 0.001 \)). Those aged ≥ 36 years were less likely to have participated in health research compared with those aged < 36 years (adjusted odds ratio = 0.46, 95% CI: 0.29–0.74; \( P < 0.001 \)) (Table 3). Male participants were more likely than female participants to be willing to participate in health research (adjusted odds ratio = 1.56, 95% CI: 1.12–2.18, \( P < 0.01 \)). Other determinants of willingness to participate in future research were age, education and employment (\( P < 0.001 \), \( P = 0.04 \) and \( P = 0.02 \), respectively).

### Discussion

This is one of the first studies to assess public participation in health research in the Middle East and North Africa Region. This study found that about 15% of the total participants had ever been invited to participate in previous health studies. The present level of community involvement in research needs improvement with a high demand for scientific-based health interventions and innovations in the national health system. The Saudi Vision 2030 for healthcare transformation seeks to improve public health by implementation of policies and interventions based on the recommendations of scientific research (20). This urges increased demand for community participation and involvement in health research to achieve a vibrant society and a better health system based on scientific evidence.

We showed that the majority of the study population had positive attitudes toward participation in health research, with a high rate (73%) of acceptance of participation among those who had received a previous research invitation. These findings are similar to other research conducted in the Gulf Cooperation Council countries (9,21). A study conducted in Qatar found that most of the population had never been invited to participate in research, but they reported positive attitudes towards such participation. The favourable attitude toward participation in research will enhance national and regional scientific mobility (15,17).

Despite the challenges associated with recruitment of research participants in Saudi Arabia, most of the participants in our study had a favourable attitude toward research participation. About 92% of participants reported that they would be willing to participate in future health research, which leads us to believe that public willingness is not a limiting factor for participation. Similar findings were found in other studies conducted in Middle Eastern countries that assessed community participation in health and clinical research (9,18,21,22). Some of these studies have found that prior awareness of health research is associated with willingness to participate in future research (9,18). Similarly, this study found that previous participation in health research had a positive impact on willingness to participate in future research.

Previous studies have found that there are challenges in recruiting some groups of participants for health research (9,21). The present study showed that middle-aged and older adults, women, unemployed people, and those with below college education were less likely to be willing to participate in health research. This may lead to under-representation of these groups and consequently biased findings in health research (4,9). Having a representative study sample reflects the sociodemographic diversity of the target population, helps strengthen external validity, and improves implementation of health research findings (4,23). Therefore, future research may study the hesitancy, barriers and motivators for participation among these groups.

We found that more male than female participants were willing to participate in health research. Low female
Table 3 Association of sociodemographic factors with public acceptance and willingness to participate in health research

| Factors                        | Levels                      | n  | %   | P value | OR  | 95% CI          | P value | AOR  | 95% CI          |
|--------------------------------|-----------------------------|----|-----|---------|-----|-----------------|---------|------|-----------------|
| **Acceptance to participate in health research** |                             |    |     |         |     |                 |         |      |                 |
| Sex                            |                             |    |     |         |     |                 |         |      |                 |
| Male                           | Accepted                    | 149| 75.6| 0.23    | 1.32| 0.84–2.10       | 0.17    | 1.45 | 0.86–2.46       |
|                               | Refused                     | 48 | 24.4|         |     |                 |         |      |                 |
| Female                         | Accepted                    | 122| 70.1|         |     |                 |         |      |                 |
|                               | Refused                     | 52 | 29.9|         |     |                 |         |      |                 |
| **Education**                  |                             |    |     |         |     |                 |         |      |                 |
| Less than college education    | Accepted                    | 85 | 75.9| 0.42    | 0.81| 0.49–1.35       | 0.4     | 0.79 | 0.46–1.36       |
|                               | Refused                     | 27 | 24.1|         |     |                 |         |      |                 |
| College education and above    | Accepted                    | 186| 71.8|         |     |                 |         |      |                 |
|                               | Refused                     | 73 | 28.2|         |     |                 |         |      |                 |
| **Employment**                 |                             |    |     |         |     |                 |         |      |                 |
| Unemployed                     | Accepted                    | 114| 74  |         |     |                 |         |      |                 |
|                               | Refused                     | 40 | 26  |         |     |                 |         |      |                 |
| Employed                       | Accepted                    | 157| 72.4|         |     |                 |         |      |                 |
|                               | Refused                     | 60 | 27.6|         |     |                 |         |      |                 |
| **Age**                        |                             |    |     |         |     |                 |         |      |                 |
| ≤ 36 years                     | Accepted                    | 186| 78.5| 0.002   | 0.48| 0.30–0.76       | 0.001   | 0.46 | 0.290.74       |
|                               | Refused                     | 51 | 21.5|         |     |                 |         |      |                 |
| ≥ 36 years                     | Accepted                    | 85 | 63.4|         |     |                 |         |      |                 |
|                               | Refused                     | 49 | 36.6|         |     |                 |         |      |                 |
| **Willingness to participate in future health research** |                             |    |     |         |     |                 |         |      |                 |
| Sex                            |                             |    |     |         |     |                 |         |      |                 |
| Male                           | Willing                     | 1565| 93.8| < 0.001 | 1.78| 1.32–2.39       | < 0.01  | 1.56 | 1.12–2.18       |
|                               | Not willing                 | 104 | 6.2 |         |     |                 |         |      |                 |
| Female                         | Willing                     | 754 | 89.4| < 0.001 | 0.37| 0.40–0.80       | 0.04    | 0.69 | 0.48–0.99       |
|                               | Not willing                 | 89  | 10.6|         |     |                 |         |      |                 |
| **Education**                  |                             |    |     |         |     |                 |         |      |                 |
| Less than college education    | Willing                     | 384 | 88.5| < 0.001 | 0.53| 0.39–0.71       | 0.02    | 0.66 | 0.46–0.94       |
|                               | Not willing                 | 50  | 11.5|         |     |                 |         |      |                 |
| College education and above    | Willing                     | 1935| 93.1| < 0.001 | 1.77| 1.31–2.38       | < 0.001 | 1.96 | 1.44–2.66       |
|                               | Not willing                 | 143 | 6.9 |         |     |                 |         |      |                 |
| **Employment**                 |                             |    |     |         |     |                 |         |      |                 |
| Unemployed                     | Willing                     | 601 | 88.6| < 0.001 | 1.77| 1.31–2.38       | < 0.001 | 1.96 | 1.44–2.66       |
|                               | Not willing                 | 77  | 11.4|         |     |                 |         |      |                 |
| Employed                       | Willing                     | 1718| 93.7| < 0.001 | 1.77| 1.31–2.38       | < 0.001 | 1.96 | 1.44–2.66       |
|                               | Not willing                 | 116 | 6.3 |         |     |                 |         |      |                 |
| **Age**                        |                             |    |     |         |     |                 |         |      |                 |
| ≤ 36 years                     | Willing                     | 1318| 94.1| < 0.001 | 1.77| 1.31–2.38       | < 0.001 | 1.96 | 1.44–2.66       |
|                               | Not willing                 | 82  | 5.9 |         |     |                 |         |      |                 |
| ≥ 36 years                     | Willing                     | 1001| 90.1|         |     |                 |         |      |                 |
|                               | Not willing                 | 111 | 9.9 |         |     |                 |         |      |                 |

AOR = adjusted odds ratio; CI = confidence interval; OR = odds ratio.
participation is a global challenge that has an impact on health research (24,25). Male participants represented > 60% of the sample size in several studies conducted to assess different health risk factors in Saudi Arabia (26–28). Under-representation of women in health research can lead to undesirable and biased outcomes for the female community in the studied population (25). Therefore, increasing female involvement and participation in health research needs to be further investigated.

There are different factors that hinder public participation in health-related research. Offering incentives to participants has commonly been used to increase research participation (29,30). However, in our study, only 4% reported that the absence of incentives hindered their participation. A study conducted in Qatar and another in Kuwait found that the most frequently reported barrier to participating in research is time constraints (9,21). In the present study, a lack of awareness about research was the most commonly reported barrier. However, we found that factors other than time constraints, awareness about research, and financial incentives affected research participation. Most participants reported other hindrances to their participation in health research, which needs to be investigated further. It is has been reported previously that privacy issues, fear of the study, and participants' confidence in data collectors have impacts on willingness to participate in research (4,7,31,32). From the review of literature, participation in research can be increased if participants are contacted by a well-known and highly reputable institution, or if the study is funded by government or charities (4,31,32). More research is needed to assess and tackle these issues to improve public participation in health research.

Given the cross-sectional nature of this study, there was no substantial evidence to claim a temporal relationship among factors. Another limitation of this study was that the sample did not reflect the entire Saudi population; therefore, these findings cannot be generalized to the whole community. The study design and sampling method of this study might have resulted in selection bias and favoured data collection from people who had a positive attitude toward participation in research. However, given the high response rate of almost 90%, this study provides a snapshot of the public's willingness to participate in health research in Saudi Arabia. It also highlighted the key sociodemographic determinants of participation in health research. Future nationally representative studies with deeper insights into the barriers and motivators for participation are needed to understand better the predictors and determinants of participation in health research. Future research may also consider collecting data from nonrespondents to discover to what extent they are different from the study sample.

Conclusions

Public participation is an integral part of the research process that contributes to health advances. Our findings have implications at the practice level to improve participation in health research. Although reduced participation rates present challenges in conducting research, we found that participation in health research was viewed favourably by most participants. The results also highlighted the sociodemographic determinants of public participation in health research. Individuals with previous participation in health research have more favourable attitudes toward participation in future health research. With a lack of data on population health nationally and regionally, this study focused on assessing participation at the data collection level. Prospective studies and interventions are recommended to improve community participation from passive to active full engagement in research. This will ensure participants' engagement not only as data points but also to empower them to be stakeholders in planning, designing and conducting research studies.

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الاستعداد للمشاركة في بحوث الصحة العامة ومحدداتها: دراسة مقطعية في المملكة العربية السعودية

الخلاصة
تؤدي المشاركة النشطة في البحوث الصحية دوراً أساسياً في إعداد وتنفيذ التدخلات والسياسات الصحية المسندة بالدليل.

الخلفية:
هدفت هذه الدراسة إلى تقييم مدى استعداد الجمهور للمشاركة في بحوث الصحة العامة ومحدداتها.

الأهداف:
1. منطقة بالمملكة العربية السعودية، في عامين 13، أجرينا مسحاً مقطعياً استهدف السكان السعوديين الذين تزيد أعمارهم ع
2. استخدام مقابلات هاتفية بمساعدة الحاسوب. قمنا بتقييم الحالة الاجتماعية والسكانية للمشاركين، ومشاركة المشاركين في البحوث، وقبولهم والتحوُّف
3. فريق البحث: أجرينا مسحاً مقطعياً استهدف السكان السعوديين الذين تزيد أعمارهم على 16 عاماً في 13 منطقة بالمملكة العربية السعودية، باستخدام مقابلات هاتفية بمساعدة الحاسوب. قمنا بتقييم الحالة الاجتماعية والسكانية للمشاركين، ومشاركة المشاركين في البحوث، وقبولهم بالمشاركة، والألعاب التي تبعوُّن مشاركتهم، واستعدادهم للمشاركة في البحوث الصحية المستقبلية. واستُخدمت تحليلات بيرسون
4. النتائج: شارك 2171 شخصاً (73% من التفاوت بين المشاركين في الدراسات البحثية، وقابل 271 شخصاً (14.8% من التفاوت بين المشاركين في الدراسات البحثية). وكان معظم المشاركين (92%) في الدراسة (2319) على استعداد للمشاركة في بحوث مستقبلية. وتمتعت المواعيد الرئيسية المرتبطة بالاستعداد للمشاركة في البحوث الصحية في كون المشاركين من الشباب، والذكور، والخبراء، والباحثين في مجال العلم، والموظفين. وكان أصحاب الخبرة السابقة في المشاركة في البحوث الصحية أكثر استعداداً بثلاث مرات للمشاركة في بحوث صحية مستقبلية من المشاركين الذين ليس لديهم خبرة سابقة (0.01>P).

الاستنتاجات: ساعدت هذه الدراسة الضوء على المحددات الرئيسية للإعداد للمشاركة في البحوث الصحية. ومعظم المشاركين لم ترُبهم من الدعوة من قبل المشاركة في البحوث الصحية، ومع ذلك، قد أبدى أغلبهم موقفاً إيجابياً إزاء المشاركة. ومع التطور السريع للنظم الصحية على الصعيدين الوطني والأقليمي، فلا تتزال مستويات المشاركة السعودية في البحوث الصحية بحاجة إلى التحسين.
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