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Barriers and Facilitators to Participation in the Employees' Health Cohort Study of Iran (EHCSIR): A Qualitative Content Analysis

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Abstract

Background: Declining enrollment poses a threat to epidemiological validity. Despite the increasing number of occupational health cohorts, evidence regarding employee-specific determinants in Iran remains limited. This study examined the perceived barriers and facilitators to participation in the Employees' Health Cohort Study of Iran (EHCSIR) among staff at the Iran University of Medical Sciences.

Methods: A qualitative study was conducted using purposive sampling to include 48 individuals: EHCSIR participants, non-participants, and coordinators. The data comprised 23 semi-structured interviews (12 participants, 7 non-participants, and 4 coordinators), four focus groups (14 participants and 11 non-participants), and narrative responses from 954 eligible employees outlining reasons for non-participation. Conventional qualitative content analysis was applied in eight stages, with thematic saturation guiding the termination of data collection. Analytic rigor was maintained through member checking, peer debriefing, and audit trails, adhering to established trustworthiness criteria.

Results: The EHCSIR study identified barriers to employee participation across three domains: Organizational (insufficient managerial support, lack of replacement staffing, elevated mission costs, scheduling conflicts), Individual (family obligations, excessive workload, transportation challenges, distrust or fear of data disclosure, health limitations, inadequate information), and Cohort-specific (prolonged timelines, fatigue, lengthy questionnaires, lack of facilities, stringent requirements such as fasting or large-volume blood draws). Facilitators were also observed at three levels: Organizational (managerial endorsement and role modeling, paid leave, accessible transportation), Individual (health monitoring, cost savings, altruistic motivation, trust in the research team), and Cohort-specific (non-invasive methods, single-visit completion, extended assessment intervals, transparent in-person recruitment, organized management, supportive environment, systematic follow-up).

Conclusion: Organizational, logistical, and perceptual factors significantly influence participation in occupational health cohorts. Improving management, infrastructure, communication, and institutional trust can enhance recruitment and retention in EHCSIR and inform similar strategies both in Iran and internationally.

Keywords: Qualitative Research, Cohort Studies, Occupational Health, Employee Participation, Barriers to Participation, Facilitators to Participation

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Introduction

Prospective cohort studies are essential for elucidating the contributions of lifestyle, environmental, and genetic determinants to disease etiology (1, 2). Population-based cohorts that integrate comprehensive individual-level data with biological specimens stored in biobanks provide particularly robust and generalizable evidence regarding the

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Key Messages:

↑What is "already known" in this topic:

Previous research indicates that participation in cohort studies is influenced by organizational factors, individual characteristics, and study design features. However, there is limited qualitative evidence regarding the specific barriers and facilitators that affect participation in the Employees' Health Cohort Study of Iran (EHCSIR).

→What this article adds:

This study examines participation barriers and facilitators within the domains of organizational, individual, and cohort design through focus group discussions and in-depth interviews. The findings underscore the essential role of managerial support and infrastructural improvements in promoting employee engagement and participation.

risk factors underlying chronic and complex diseases (1, 2). Despite their epidemiological significance, such investigations are inherently resource-intensive, necessitating substantial financial investment, sustained infrastructure, and prolonged follow-up (1, 2). Their methodological validity and statistical power critically depend on the timely recruitment and long-term retention of an adequate number of eligible participants. However, non-participation poses an increasingly recognized and serious threat to cohort integrity (3).

Failure to achieve target recruitment diminishes representativeness and external validity, while increasing operational costs, extending timelines, and, in some cases, jeopardizing the continuation of the study (4, 5).

Recruitment and retention in health research represent multifactorial processes influenced by both structural and individual-level determinants. Structural barriers may arise from study-specific characteristics, such as design complexity, perceived risks; including travel-related burdens, and procedural load. Conversely, individual-level influences encompass psychosocial status, socioeconomic position, health conditions, lifestyle patterns, access to medical services, health-seeking behaviors, geographical accessibility, time availability, and awareness or understanding of research aims and methods (6-11).

Strategically addressing these barriers can enhance cohort participation rates. Empirical evidence indicates that interventions such as implementing appropriate invitation methods (12), increasing financial or non-financial incentives, retraining recruitment staff, simplifying enrollment protocols, and minimizing the time, cost, or effort required for participation have resulted in improvements in certain contexts (13). Nevertheless, there is no universal solution; rather, optimized recruitment necessitates tailored, multicomponent strategies that address the specific needs and concerns of the target population. In Iran, numerous health studies are hindered by challenges in enrolling sufficient numbers of eligible participants. Published evidence regarding factors affecting recruitment and retention in the Iranian research setting is limited (14).

The Employees' Health Cohort Study of Iran (EHCSIR), a longitudinal investigation targeting health system employees, has encountered slower than anticipated participant accrual despite offering an extensive package of complimentary clinical and paraclinical evaluations, including blood and urine tests, optometry, audiometry, body composition analysis, electrocardiography (ECG), spirometry, blood pressure measurement, and on-site meals, along with administrative leave to facilitate attendance. In light of this considerable gap between anticipated and actual recruitment performance, we conducted a qualitative study among a purposive sample of EHCSIR-eligible individuals to systematically identify perceived barriers and facilitators to participation, with the aim of informing context-specific, evidence-based strategies for optimizing both recruitment and retention.

Methods

Type of study

This investigation employed a qualitative content analysis approach, a systematic method for reducing textual data and interpreting its meaning within the specific context in which it was produced. The aim was to identify underlying themes and extract substantive insights from the data (15).

Participant recruitment

Eligible employees of Iran University of Medical Sciences (IUMS) who met the inclusion criteria for the Employees' Health Cohort Study of Iran (EHCSIR) were selected through purposive sampling, ensuring maximum variation in terms of participation status in EHCSIR, age, and occupational category. Recruitment was conducted by EHCSIR coordinators. Additionally, three EHCSIR coordinators, identified as informed sources regarding potential participants, were also recruited to participate in this study.

Data collection

Data were collected using three complementary qualitative methods: (1) narrative accounts obtained during the EHCSIR invitation phase, (2) semi-structured interviews, and (3) focus group (FG) discussions. The research team developed three distinct semi-structured, open-ended interview guides specifically tailored for EHCSIR participants, EHCSIR nonparticipants, and study coordinators. These guides included core questions addressing perceived barriers and facilitators to participation (e.g., "What motivated you to participate in EHCSIR?"; "What was your primary reason for not participating in EHCSIR?"). Additional probing questions emerged iteratively based on participants' responses, such as, "Have you recommended others to participate in EHCSIR?" This design allowed participants to articulate their perspectives and experiences in depth. For FG sessions, the first author and three colleagues, each formally trained in qualitative research methods and familiar with EHCSIR, served as moderators. FG sessions lasted an average of 40 minutes. The first author also conducted all individual face-to-face interviews, each with a mean and median duration of 12 minutes. At the beginning of each interview and FG session, moderators introduced themselves, explained the objectives and significance of the study, and obtained verbal informed consent for audio recording. To ensure participants' comfort and confidentiality, all sessions were conducted at their workplaces in private rooms with only the interviewer(s) and participant(s) present. Immediately after each session, a designated researcher transcribed the audio recordings verbatim in Microsoft Word. Transcripts underwent multiple readings to ensure accuracy and completeness. Although thematic saturation was achieved after 20 interviews, data collection continued to capture maximum variation across participant characteristics. Additionally, narrative accounts concerning perceived barriers and facilitators to EHCSIR participation were gathered from 954 individuals who either declined participation or did not attend within the scheduled timeframe during the invitation process.

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Data analysis

Data were analyzed using an eight-step qualitative content analysis approach, which included the following steps: transcription of interview recordings, identification of semantic units, development of unique codes, preliminary coding, coding of the full content, identification of categories, extraction of themes, drawing interpretations, and final reporting (15).

Strategies for trustworthiness

To enhance the credibility of the data, the researcher maintained prolonged engagement and persistent immersion in the dataset, employed member checking, and conducted comparative and continuous analyses. Initial coding was performed by the first author; subsequently, to assess the reliability of the data, all authors independently reviewed the codes, verifying and confirming the accuracy of the coding process.

To ensure confirmability, all stages of the research process were meticulously documented and reported, allowing other researchers to replicate the procedures. To enhance the transferability of the findings, participants' quotations were presented verbatim, precisely as stated. Additionally, maximum variation sampling was employed concerning EHCSIR participation status, gender, educational background, and occupational diversity.

Ethical Considerations

Prior to data collection, ethical approval was secured from the Ethics and Research Committee of Iran University of Medical Sciences (Approval Code: IR.IUMS.REC.1398.281). Written or verbal informed consent was obtained from all participants. The research team underscored participants' right to withdraw from the study at any stage without penalty, ensured the protection of anonymity, and maintained strict confidentiality of all data. Upon completion of the interviews, small tokens of appreciation were presented to participants.

Results

The study sample comprised both focus group (FG) sessions and in-depth, in-person interviews. Four FG sessions were conducted with a total of 25 participants: two sessions with 14 EHCSIR participants (8 females, 6 males) and two sessions with 11 EHCSIR non-participants (7 females, 4 males). In total, 23 individuals participated in the in-person interviews: 4 EHCSIR coordinators (3 females, 1 male) serving as informed key informants; 12 EHCSIR participants (9 females, 3 males); and 7 EHCSIR non-participants (4 females, 3 males). One male emergency staff member, a non-participant in EHCSIR, withdrew prior to the interview due to work obligations. Additionally, during the EHCSIR invitation process, 954 non-participants (625 females, 329 males) were asked to specify their primary reason for non-participation. The demographic characteristics of all study participants are presented in Table 1. The barriers to participation in the EHCSIR study, as reported by non-participants during the invitation phase, are presented in Table 2. In response to the phone inquiry, 276 individuals (28.9%) indicated that they were unwilling to participate in the study. The primary barriers to participation included 133 individuals (13.9%) citing a lack of time, 135 individuals (14.2%) citing job-related commitments, 52 individuals (5.5%) citing personal responsibilities, 89 individuals (9.3%) citing the presence of young children, 10 (1.0%) citing caring for dependent family members, and 19 (2.0%) citing Fixed morning shift. In total, 438 employees (45.9%) identified logistical issues as the main reason for their non-participation in the study.

Barriers to participation in the EHCSIR study

Barriers to participation in the EHCSIR study were categorized into three main themes (Table 3): organizational barriers (including lack of managerial endorsement, negative attitudes or insufficient awareness among some managers regarding the study objectives, lack of access to coordinators, absence of substitute staff during leave, high costs associated with administrative missions and staff deployment, and overlap with routine programs), individual barriers (such as family commitments, multiple jobs or high workload, transportation challenges including distance, cost, time, and safety concerns, mistrust toward the study objectives and fear of genetic data disclosure, psychological factors such as fear of disease detection or aversion to phlebotomy, low motivation or perception of irrelevance, health limitations, and insufficient information dissemination), and cohort-related barriers (which include practical discomfort such as prolonged duration, exhausting procedures, and excessive numbers of questions, lack of facilities such as childcare or transportation services, and procedural requirements including prolonged fasting, relatively large blood draws, and extended presence at the study site).

In the organizational domain, the most significant challenges included a lack of managerial endorsement, negative

Table 1. Demographic characteristics of participants

Variable		Narrative data n = 954 (%)	Interview n = 23 (%)	Focus-group discussion n = 25 (%)
Gender	Male	329 (34.5)	14 (61.0)	4 (16.0)
	Female	625 (65.5)	9 (39.0)	21 (84.0)
Job category	Faculty member	66 (6.9)	1 (4.3)	3 (12.0)
	Administrative	99 (10.4)	7 (30.4)	13 (52.0)
	Health care	642 (67.3)	9 (39.1)	1 (4.0)
	Services	147 (15.4)	6 (26.1)	8 (32.0)
Age (years)	Mean (range)	42.0	41.7 (30-58)	-
Job experience (years)	Mean (range)	11.9	13 (2-28)	-

-Data not collected for this group

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Table 1. Reported barriers to participation during invitation by non-participants

Responses	No willing		I cannot come currently		I cannot come		Total n (%)
	Male n (%)	Female n (%)	Male n (%)	Female n (%)	Male n (%)	Female n (%)	
Unwillingness	92 (9.6)	184 (19.3)	-	-	-	-	276 (28.9)
Job business	-	-	13 (1.4)	18 (1.9)	46 (4.8)	58 (6.1)	135 (14.2)
Lack of time	-	-	-	-	66 (6.9)	67 (7.0)	133 (13.9)
Having young children	-	-	-	-	3 (0.3)	86 (9.0)	89 (9.3)
life business	-	-	8 (0.8)	5 (0.5)	11 (1.2)	28 (2.9)	52 (5.5)
Caring for dependent family members	-	-	6 (0.6)	3 (0.3)	1 (0.1)	-	10 (1.0)
Fixed morning shift	-	-	-	-	3 (0.3)	16 (1.7)	19 (2.0)
Lack of cooperation among managers.	-	-	-	-	1 (0.1)	3 (0.3)	4 (0.4)
I do the tests myself	17 (1.8)	45 (4.7)	-	-	-	6 (0.6)	68 (7.1)
I am currently unable to attend	-	-	25 (2.6)	37 (3.7)	-	-	62 (6.5)
Extended duration of participation	3 (0.3)	3 (0.3)	-	-	4 (0.4)	1 (0.1)	11 (1.2)
Being far away	-	-	-	-	-	4 (0.4)	4 (0.4)
Near retirement	10 (1.0)	10 (1.0)	-	-	-	-	20 (2.1)
Pregnancy	-	-	-	-	-	19 (2.0)	19 (2.0)
Having an underlying disease	-	-	9 (0.9)	18 (1.9)	2 (0.2)	8 (0.8)	37 (3.9)
Fear of needles	-	2 (0.2)	-	-	-	-	2 (0.2)
Other reasons	-	-	8 (0.8)	4 (0.4)	1 (0.1)		13 (1.4)
Total	122 (12.8)	244 (25.6)	69 (7.2)	85 (8.9)	138 (14.5)	296 (31.0)	954 (100)

Table 2. Reported barriers to participation

Them	Category	Meaning unit
Organizational barriers	Lack of cooperation from management.	– Not accepting – Knowing it useless – Wasting money
	Lack of resources	– Multiple responsibilities – Lack of replacement personnel. – Increased workload on the day following participation in the study.
EHCSIR barriers	Practical discomfort	– The time required is too great. – Being uninteresting. – Lots of questions
	Lack of facilities	– The absence of a designated space for childcare. – Lack of transportation service
Individual barriers	Lack of time or excessive busyness.	– Multiple responsibilities – Various life responsibilities – Having multiple jobs
	Transportation difficulties	– Being boring – Distance to cohort center – Travel time
	Mistrust	– A lack of trust in the confidentiality of information. – Doubts about how the data will be used – Fear of identifying substance abuse.
	Fear	– Fear of finding out the health status – Afraid of needles – Fear of possible complications
	Health problems	– Underlying diseases – Physical inability – Fatigue and monotony resulting from the administration of excessive tests.
	Lack of motivation	– Disapproval of previous participants – Ignoring their health – Performing tests routinely – Satisfaction with health status
	Lack of knowledge	– Lack of information about the study conduction Lack of sufficient information about the benefits of the study

attitudes or limited awareness among managers, and insufficient communication with coordinators. The absence of substitute staff, high mission-related costs, and overlap with periodic work programs substantially hindered staff deployment. As one coordinator explained: "*Our manager said this project is a ridiculous game and does not accept it at all. When the manager does not agree, they neither provide human resources nor cooperate*." Another participant noted: "*I am the only person here, and I have no replacement*." From a financial perspective, one manager

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added: "*Deploying this number of staff for administrative missions has a high financial cost, and we cannot send this many people within a month*." Concerns about transportation also emerged, as in: "*I don't know the way*," which, particularly for women in rural areas, was coupled with safety considerations.

At the individual level, family commitments - particularly among parents of primary school children - high workloads or multiple employments, and transportation challenges, including long distances, costs, travel times, and safety concerns, were frequently reported. Additionally, mistrust regarding study objectives, fear of genetic data disclosure, apprehension about disease discovery, aversion to blood sampling, low motivation, and perceptions of irrelevance to personal health or a belief in being in perfect health were also noted. Health-related limitations, such as chronic illness, pregnancy, and temporary illnesses, as well as insufficient information dissemination especially during night shifts were among the other factors identified. One participant stated: "*When there is no place for my child, how can I come?" while another remarked: "If there's anyone healthy at the university, it's me; so why should I be tested?*"

Within cohort-related barriers, respondents reported practical difficulties, including the lengthy duration required for participation, fatigue resulting from study procedures, and the extensive number of questions. Additionally, the lack of facilities, such as adequate childcare provision and transportation services, along with procedural requirements such as a 10-hour fasting period, relatively large blood sampling (30 cc), and the necessity for continuous presence for 6–7 hours for examinations and questionnaire completion, were recognized as significant challenges. Although some participants suggested solutions, such as paid leave or transportation provision, several perceived these requirements as inherently deterrent. As one participant noted: "*If my boss agrees and allows me, I will come*." Another remarked: "*When the coordinator came and explained everything in person, I was convinced to participate*." These accounts indicate that while certain barriers could be mitigated through managerial support and infrastructural facilitation, others are intrinsically linked to the study's design and procedural demands.

Facilitators' participation in the EHCSIR study

Facilitators of employee participation in the EHCSIR were categorized into three overarching themes (Table 4): organizational facilitators (managerial endorsement, role-

Table 3. Reported facilitators to participation

Theme	Category	Meaning unit
Organizational facilitators	Managerial encouragement	- Manager participation
		Encouragement
	Managerial cooperation	Issuance of daily administrative assignment
		Provide transportation
Individual facilitators	Perceived benefit	Free of charge for tests
		Gaining knowledge of one's own health.
		Use test results for current physical problems
		Replacement for the annual checkup
		Assessment of health items that are not typically evaluated.
	Altruism	Identify occupational risk factors
		Help improve community health
		Help in medical research
		The feeling of being useful
	Trust	Familiarity with the principal researcher
		Confirmation of previous participants
		Conducting the study by the university.
The facilitator of the EHCSIR.	Convenience	No intervention
		Perform multiple experiments in one centralized location
		Perform the tests in one day
	Study transparency	Providing complete information
		Providing in-person information
	Proper management of study	Proper planning and execution
		Proper time management
		Perform the tests safely
		Perform the tests without any concerns
		Appropriate facilities
	Establishing proper communication	Suitable guidance
		Appropriate scientific information regarding the study personnel.
		Appropriate behavior
		Work discipline
		Appropriate answering to questions
		Value the participants.
	Cooperation of coordinator	Being responsible
		Proper communication between the coordinator and employees.
		Proper communication between the coordinator and the managers.

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model behavior by managers, provision of paid leave, transportation support); individual facilitators (recognition of the study's utility for routine health monitoring, fulfillment of specific healthcare needs, reduction of personal expenses, altruistic motivations, trust in the research process, familiarity with the principal investigator); and cohort-related facilitators (non-invasive data collection procedures, four-year intervals between assessments, completion of all study components within a single day and at a single site, transparent and in-person recruitment, well-structured management processes, positive participant-staff interactions, and sustained commitment and follow-up by the designated coordinator).

Within the organizational domain, endorsement by managerial staff emerged as a critical driver of participation, both through explicit encouragement and by modelling desired behavior. The decision of managers to enroll themselves generated strong motivational cues for subordinates: "*When our manager came and registered, others found the courage to join. He said this study benefits us, so we all went*." Beyond verbal support, tangible organizational measures, including the provision of paid leave and transportation, further enabled participation: "*During those three months when a car was provided to go to the center, everyone went*." In a unit achieving a 70% participation rate, the manager reported: "*We both granted leave and provided transportation*." In some instances, the necessity of managerial permission remained a prerequisite: "*If my boss agrees and gives me permission, I will come*."

At the individual level, personal motivations emerged as the most frequently cited facilitators. For many participants, free and comprehensive clinical examinations were perceived as an opportunity for periodic health assessment: "*I wanted to do my annual check-up*." Some participants joined to address specific healthcare needs: "*I wanted to change my eyeglass prescription, and the optometrist did it right there*." Perceived cost savings were communicated informally among colleagues: "*I told them you might want to do blood and urine tests; it's expensive at the hospital, but here they do it for free, and if there's any problem, they'll inform you*." Altruistic values were also evident: "*Besides the personal benefit, I felt I was contributing to the advancement of science and the nation's health*." Trust in the study process, strengthened through positive peer experiences, managerial participation, and institutional (university) endorsement, was regarded as an important enabler: "*At first, they were skeptical, but after the invitation letter arrived and managers joined, the examination became routine*." Familiarity with the principal investigator further reinforced this trust: "*When I found out the university was behind this, I felt assured*."

Cohort-related facilitators were primarily linked to design and implementation features that minimized participant burden. Non-invasive data collection methods, extended intervals (four years) between follow-up assessments, and the ability to complete all study procedures within a single day were highly valued: "*The good thing was that everything was finished on the same day; there was no need to come several times*." Transparent recruitment procedures, particularly those involving face-to-face engagement, were instrumental in overcoming hesitation: "*When the coordinator came and explained everything in person, I was convinced to participate*." The study's management quality characterized by meticulous scheduling, adherence to safety protocols, provision of suitable facilities, catering services, and an overall supportive environment was explicitly praised: "*Everything was organized, the place was nice, and they even provided lunch. I had no concerns at all*." Positive interactions with study personnel further enhanced participant satisfaction: "*After they went, they were very pleased and spoke highly of it*." Likewise, another participant stated: "*Everyone said it was good that the tasks were completed in one day and the staff were kind*." The dedication and persistence of the coordinator, including the resolution of leave-related issues, were considered essential in addressing residual participation barriers: "*Our coordinator was very committed, kept everything moving forward, and even solved the leave problem*."

Discussion

This qualitative study offers valuable insights into the various dimensions of facilitators and barriers affecting the participation of health system employees in health studies. We found that the motivations and constraints influencing the participation of IUMS employees in the cohort study were largely consistent with those reported in other research and groups (6, 15). In addition to the common challenges faced by other health studies in recruiting the target population, the executors of EHCSIR encountered organizational barriers and issues. Insufficient information among unit managers regarding the implementation of EHCSIR, coupled with their negative attitudes towards health studies, as well as a lack of manpower and financial resources, were identified as organizational obstacles to employee participation in EHCSIR. Conversely, this study identified the involvement of unit managers in the research, their positive attitudes towards cohort studies, and their support and encouragement for employees to participate as facilitators of participation. The occupation of the target group and work-related issues have been cited as barriers to participation in health studies (10, 17-20).

In this study, individuals overwhelmingly identified multiple logistical barriers; specifically, a lack of time and being overly busy have significantly diminished their ability to participate in EHCSIR. This issue has been highlighted by target groups in various studies and communities as the primary barrier to participation in health studies (16-22). Furthermore, in addition to the job responsibilities previously mentioned, our study results, along with those of other studies, indicate that the likelihood of women's participation is strongly influenced by their responsibilities for caring for children and other dependent family members (17-20).

The results of studies have indicated that discomfort related to the study process, duration, content, and type of tests conducted can diminish the willingness of individuals to participate (7, 18). In this study, we also identified that the lengthy assessment duration, the extensive number of questions, the volume of blood samples required, and fast-

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ing were significant sources of discomfort for several participants. Moreover, the absence of childcare facilities contributed to the reluctance of some individuals, particularly women, to engage in the study. Previous research has demonstrated that providing amenities at the study site, such as free parking (10) and childcare facilities (18), along with modifications to the visitation procedures—such as reducing visit duration—can facilitate greater participation in the study.

Various studies have indicated that issues related to traveling to the study center pose significant barriers to achieving recruitment goals (7, 10, 18-20, 22-24). In this study, as well as in others, factors such as travel costs and time, along with concerns regarding the difficulty and safety of travel, were identified as key issues that diminished the likelihood of attendance among employees, particularly women, in EHCSIR. To address these barriers and enhance recruitment, it is essential to consider arrangements that facilitate travel (16, 19), such as providing compensation for travel expenses (10) and planning visits at locations that are easily accessible (9, 10, 19).

Psychological barriers have been identified in various studies as significant factors contributing to the non-participation of the target group in health research. A lack of trust in researchers and studies has been frequently cited as a common barrier to participation, particularly among minority populations (6, 7, 9, 10, 16, 25). Additionally, in this study, some individuals expressed concerns regarding the confidentiality of their information and the manner in which their data would be utilized (25).

Notably, some of this mistrust may stem from insufficient information about health studies.

Results from this study, along with findings from similar articles, have identified fear as a significant barrier to participation in health studies. Some individuals refrain from undergoing health tests due to the fear of being diagnosed with an unknown disease, leading them to decline participation in the study. Additionally, fears related to injections (25), concerns about injury or pain (25), and apprehension regarding exposure to certain risk factors have contributed to the reluctance of some individuals to participate in these studies. Previous research has highlighted underlying health conditions and the overall health status of individuals as barriers to participation (7, 17, 18).

Consistently, our study found that some individuals were unwilling to engage in the study process due to illness, physical weakness (18), the burden of multiple tests, the demands of managing their health conditions, fatigue from caregiving, pregnancy, and childbirth.

The results of this study, along with findings from other research, indicate that some individuals do not perceive a need to participate in health studies due to routine testing or care (18), recent testing prior to the study, and a general sense of well-being without health concerns (18). This reluctance to engage in the study may stem from a lack of perceived personal benefits associated with participation. Furthermore, some individuals decline to participate in the study due to a disregard for their health. The findings of this study reveal that, consistent with other research (17), the primary reason for a significant proportion of employees opting out of the EHCSIR is their unwillingness to engage in health studies.

In most studies, the primary reason for the lack of participation among the target population in health studies and the health system (6, 10, 16, 26) was their lack of awareness. Additionally, the quality of information provided about the study procedures (27) and objectives, as well as the organization supporting the study (10), significantly influenced individuals' decisions to participate. Unlike findings from other studies, the target group of the EHCSIR, which comprised employees of the Iran University of Medical Sciences, generally possessed sufficient knowledge regarding health research. In this context, it is unlikely that a lack of awareness serves as the major barrier to participation. Instead, this study identified that the provision of incomplete information about the execution of the study was more impactful. Nevertheless, the role of awareness should not be entirely dismissed, as some employees held misconceptions about the cohort study, perceiving it as a precursor to a clinical trial. Others anticipated diagnosis and referral should they encounter health issues. This erroneous expectation stems from insufficient understanding of the purpose of cohort studies, a phenomenon recognized in the literature as diagnostic misconception, which is a subtype of therapeutic misconception. It is hoped that by providing clear information, these misunderstandings can be addressed, thereby increasing the participation rate (11, 26).

Studies have demonstrated that the decision to participate in a study can be influenced by the approval or rejection of individuals who have previously participated (6, 7, 26). In this study, the individuals eligible to participate in EHCSIR are co-workers with close relationships, and the approval and satisfaction of those who participated prior have encouraged others to join. Our study, along with several others, has identified respectful, flexible, and empathetic behavior, as well as effective communication skills of the study personnel, as crucial factors in recruiting eligible participants (10, 19, 28). Conversely, the dissatisfaction expressed by some participants has led to a decline in willingness among others to participate in the study.

Finally, certain challenges, including health issues, the implementation of periodic schemes, and children's school schedules, have temporarily diminished the ability to participate. These factors indicate that to improve the participation rate, study executives should conduct invitation activities multiple times.

As demonstrated by our study and others, the primary motivation for individuals to participate in health studies is the personal benefits they receive (6, 7, 9-11, 20, 26, 29). These benefits include increased awareness of health status (11, 20, 26, 29), financial incentives (6) such as free tests (11), the application of test results to current health issues (6, 29), and access to tests that are not typically conducted.

Altruism has been identified by participants as a motivation for participation in our study as well as in other studies (6, 7, 9-11, 20, 25, 26, 29). Participants cited contributing to science and conducting health research (6, 10), helping others (6, 11, 28), and benefiting future generations (11) as key motivations. Additionally, identifying occupational risk factors and utilizing the study's results to improve

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working conditions and promote community health (10) have also been reasons for participation.

Coordinators have been used as part of the recruitment strategy in EHCSIR. Personal characteristics of coordinators, such as being engaged, consistent, and maintaining positive relationships with co-workers and unit managers, facilitated participation in EHCSIR. Other studies have demonstrated that establishing a recruitment mechanism, where information is provided and advice is offered by individuals who are accepted and trusted by the target group, along with the ability to communicate effectively, can significantly enhance the likelihood of participation among the target group (6, 9, 10, 25). Therefore, the careful selection of coordinators and the manner of invitation play a crucial role in the successful recruitment of participants.

One of the strengths of this study is that the participants were eligible for EHCSIR research and were invited to participate in EHCSIR. Consequently, they articulated the barriers and facilitators they perceived. The participants exhibited maximum diversity regarding the discussion topics. Additionally, a significant number were queried about their reasons for non-participation.

This study suffers from the inherent limitations of qualitative research, characterized by a small sample size and a lack of generalizability. A broad range of factors influencing individuals' participation in health studies was identified through this research. However, due to the qualitative nature of the study, we cannot accurately ascertain the effects of each factor. It is essential to conduct a quantitative survey to illustrate the impact of each factor.

Conclusion

The findings of this study can inform decision-making and the implementation of recruitment strategies. In summary, our results indicate that the factors influencing individuals' participation in health studies are multidimensional and shaped by various elements. Nevertheless, barriers to participation in health studies are not insurmountable. It is important to acknowledge that there is no straightforward solution to this issue. Therefore, we recommend that researchers first acquire a thorough understanding of the concerns of their target population to effectively achieve the desired level of participation through a set of recruitment strategies tailored to their specific audience.

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Conflict of Interests

The authors declare that they have no competing interests.

Authors' Contributions

S.A.M contributed to conceptualization, supervision and management, study design, data analysis, reporting, and manuscript drafting. R.R contributed to conceptualization, study design, data analysis, reporting, and manuscript drafting. S.H.H contributed to data analysis, interview transcription, manuscript drafting, and final manuscript preparation.

Ethical Considerations

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the guidelines established by the Committee on Publication Ethics (COPE). Ethical approval was obtained from the Ethics Committee of Iran University of Medical Sciences (Ethics Code: IR.IUMS.REC.1398.281). All participants provided written informed consent after being fully informed about the study objectives and procedures. The confidentiality of participants' personal and health information was strictly maintained, and no identifying information has been disclosed. The authors emphasize that this article represents their original work, has not been submitted concurrently to any other journal, and that all potential conflicts of interest have been declared in accordance with COPE standards.

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Data Availability

Anonymized interview transcripts are available upon reasonable request to the corresponding author.

AI Use Statement

The manuscript was polished for English grammar and style using Grammarly. All scientific content was written and finalized by the authors.

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