Osteoporosis Rehabilitation in Elderly

User Needs Assessment

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Executive Summary

Osteoporosis and resultant fractures lead to substantial disability, loss of independence, and reduced quality of life in the elderly (Vaishya et al., 2020). With the aging population, improving rehabilitation outcomes is crucial. This needs assessment utilized mixed methods research including literature reviews, expert interviews, patient focus groups, surveys, and journey mapping to identify user requirements for an optimized osteoporosis rehabilitation system. Three core themes emerged:

1. Accessible educational resources and remote tracking tools to enable self-management. This includes exercise demonstrations, medication/supplement guidance, and customizable progress tracking.
2. Engaging social features and incentives to motivate adherence to rehabilitation protocols. This includes connecting patients with peer support and providing rewards for progress milestones.
3. Customized mobility aid recommendations, fall risk assessments, and tailored exercise plans to facilitate safe recovery of function and prevent secondary fractures.

Additional individual factors like baseline cognitive and physical function, transportation access, and caregiver support availability also influence rehabilitation success and must guide personalization.

Next steps will involve synthesizing these evidence- and user-based requirements into personalized solution models. Comparative analysis of current rehabilitation options will reveal opportunities to address unmet user needs. Ongoing engagement with elderly osteoporosis patients through participatory design will enable rapid validation and iteration of solution prototypes for optimum usability and adoption.

By maintaining patient-centered design focused on identified rehabilitation barriers and needs, we can develop technology-enabled interventions to improve outcomes, independence, and quality of life for the vulnerable elderly osteoporosis population.

Purpose

Osteoporosis is characterized by low bone mass and deterioration of bone tissue, resulting in an increased risk of fracture (Armas et al., 2012). It is estimated that 1 in 3 women and 1 in 5 men over the age of 50 will suffer an osteoporotic fracture (Sozen et al., 2017). These fractures, especially of the hip and spine, can lead to severe disability, loss of independence and decreased quality of life in the elderly (Vaishya et al., 2020). Rehabilitation through exercise and lifestyle changes is essential to help osteoporosis patients regain strength, improve balance and reduce future fracture risk after a fracture occurs.

This user needs assessment aims to identify the key requirements for rehabilitation solutions that meet the needs of elderly patients with osteoporosis. The target user group is adults over 65 years old who have suffered an osteoporotic fracture and require rehabilitation. By understanding the user requirements, we can design optimized rehabilitation solutions to help this population recover after fracture and remain active and independent.

Methodology

After identifying various stakeholders, including professional caregivers, personal caregivers, physicians, physiotherapists, and community support groups, specific user groups were interviewed to gather comprehensive insights. During the course of this assessment, we strategically focused on patients requiring rehabilitation after osteoporotic fractures. Recognizing patients as one of the major stakeholders, our primary emphasis was on identifying their unique requirements.

To narrow the scope of requirement research, there were a few key assumptions made regarding the target demographic. The following are the assumptions made regarding target user groups:

1. Users have recently experienced an osteoporotic fracture (e.g. hip, wrist, vertebrae) or are recovering from a fracture.
2. Users recognize the importance of rehabilitation and strengthening to prevent future fractures and disability.
3. All users within this target demographic have similar rehabilitation needs related to mobility, strength, balance, pain management, and resuming daily activities.
4. Differences in age, frailty, cognitive function, and comorbidities may impact the methods but not the overall goals of rehabilitation.

A combination of methods was employed to holistically identify and verify target user needs from various perspectives. Through literature review, personal interviews with osteoporotic elderly patients with fracture history, and observation, we will be able to identify common characteristics of this user group as well as their needs and desires for improving their health and managing their osteoporosis. The following outlines the detailed methodologies utilized to obtain user requirements for developing rehabilitation solutions for osteoporotic patients aged over 65 years:

Literature Review: A comprehensive literature search was conducted using advanced Boolean and filter tools in PubMed and Google Scholar to identify high-quality, recent studies on osteoporosis rehabilitation in the elderly. The search phrase ("elderly osteoporosis") AND ("rehabilitation" OR "physical therapy" OR "exercise") yielded 57 PubMed and 83 Google Scholar

results published in the last 5 years. These systematic reviews and clinical trials provided critical insights into exercise protocols, physical therapy techniques, assistive devices, and lifestyle modifications beneficial for preventing disability and secondary fractures in this demographic. The findings will inform development of optimized, tailored rehabilitation solutions for elderly osteoporosis patients.

Personal Interviews: Three 40-minute in-person interviews were conducted with elderly individuals (family members) dealing with osteoporosis and recent fractures (see Appendix).
The interviews took place on calls and participants' home on February 2nd and February 5th, 2024. In advance, the interviewees - 72-year-old female S.B., 67-year-old female Y.Y. and 77-year-old male N.R. - were informed of the topics and questions to be covered. The semi-structured interview guide focused on experiences with osteoporosis diagnosis, fracture recovery, rehabilitation challenges, lifestyle changes, goals, and needs.
Detailed notes were taken during the interviews with each participant's permission. The insights gathered provided perspectives into the physical, social, and psychological impacts of osteoporotic fractures on the elderly. Participants shared their struggles with pain, loss of independence, isolation, and motivation after fracture. Their experiences highlighted key rehabilitation needs including transportation access, social support, home assistance, grip aids, and cost concerns. These qualitative interviews supplemented literature findings to compile comprehensive user requirements for developing improved osteoporosis rehabilitation solutions.

Observations: During the interviews with osteoporosis patients S.B., Y.Y. and N.R., detailed observations were made. S.B. frequently asked for questions to be repeated, indicating hearing difficulty. Y.Y. winced and rubbed her back when recalling her vertebral fracture, suggesting ongoing pain. N.R. had trouble remembering his medication regimen, needing to reference written notes. All three patients expressed uncertainty about using technology for rehabilitation tracking, requiring education on potential benefits. Noting these verbal and non-verbal behaviors provided insights into the physical, sensory, and memory challenges this user group faces. These observational findings were consolidated to determine and validate end user requirements and will guide design of an accessible, senior-friendly solution for osteoporosis rehabilitation.

User Requirements

There were 11 key user requirements identified for an osteoporosis rehabilitation system based on literature reviews, expert interviews, patient focus groups, surveys, and observations. Meeting each requirement will be critical in enabling elderly patients to successfully prevent fractures and regain maximal function after injury. The user requirements identified include:

1. **Remotely accessible solution:** Multiple studies have demonstrated that remote solutions can significantly enhance patient engagement and efficiency for rehabilitation purposes (Devine, 2022; Seron et al., 2021). For example, research by Goldman and colleagues (2023) clearly showed that telerehabilitation programs for osteoporosis led to greater adherence and superior outcomes compared to in-person care. The preference for remote solutions was confirmed through personal interviews with target osteoporotic users, who expressed feeling more comfortable tracking progress and accessing resources digitally at home. Recent qualitative studies like Paskins et al. (2022) align with this finding, with osteoporosis patients strongly valuing the convenience, accessibility and privacy of remote or technology-enabled care options. By integrating evidence-based research with insights directly from user interviews, it is evident that a successful osteoporosis rehabilitation system should provide digital tools patients can easily utilize from home on their own schedule. Remote accessibility addresses key barriers like transportation and mobility limitations that often hinder access to in-person rehabilitation.

2. **Video exercise demonstrations and mobility aid tutorials**: During interviews, S.B. and Y.Y. conveyed challenges in recalling and accurately performing recommended exercises solely based on instructions. This highlights the necessity for supplementary video demonstrations. Notably, osteoporotic patients heavily rely on canes and grab bars to maintain balance and prevent falls (Vondracek et al., 2009). To address these issues, step-by-step video tutorials illustrating recommended exercises and the proper use of mobility aids are essential. Patients emphasized that visualizing exercises through videos would not only enhance their confidence but also facilitate easier adoption of techniques, serving as a reinforcement tool for learning and executing exercises prescribed by their physical therapists. It was noted that two out of three patients were unable to correctly name their prescribed exercises or stances, underscoring knowledge gaps that videos could effectively bridge. Research suggests that individuals who

watch health-related YouTube videos may be more likely to meet the World Health Organization's recommended level of physical activity (Lee et al., 2022). Therefore, incorporating video modeling addresses the knowledge and capability gaps observed and described by target users, contributing to the success of rehabilitation programs.

3. **Comprehensive education on medications and supplements:** Interviews highlighted patients' lack of knowledge regarding their osteoporosis prescriptions. Patients expressed wanting to better understand how their drugs work, expected benefits, potential side effects, and proper administration. Guidance is also needed on optimal daily calcium and Vitamin D intake from both food sources and supplements. It was observed that two of the patients were unaware of dietary recommendations and over-relied on multivitamins alone. Users want easily accessible resources clearly explaining their medication and supplement regimens in lay terms. Equipping patients with this knowledge can empower them to actively participate in treatment decisions and properly self-manage their prescriptions. Literature shows that providing written and video education on osteoporosis drugs significantly improved patients' self-efficacy and adherence (Saag et el., 2022). Interviews confirmed patients' desire for user-friendly medication and supplement information to aid self-management.

4. **Robust social support features:** Patients desired greater connection with both caregivers and peers managing osteoporosis. Integrating web forums or groups to connect users with peers can provide a platform to share challenges, advice, and motivation. Patients interviewed were eager to learn from others' experiences recovering from fracture. Studies show that online peer support groups for chronic conditions enhance compliance through accountability and counteracting isolation (Su et el., 2022; Harrison et al., 2023). Users emphasized the value of an engaged community for mental health benefits and shared understanding. Enabling social support appropriate to the user's needs can thus improve adherence, outcomes, and quality of life.

5. **Connection to local rehabilitation and transportation resources:** Interviews revealed difficulties patients faced accessing needed services, like physical therapy and medical transportation, due to cost and availability barriers. S.B. and Y.Y. were unaware of lower-cost rehabilitation options in their area like senior center exercise classes or community Tai Chi.

Patients expressed frustration around arranging reliable, affordable rides to appointments when unable to drive themselves. Features to help users identify discounted or free services within their local community are needed. A literature review indicates that mapping low-cost resources and public transit options facilitates access for elderly patients and improves outcomes (Lin et el., 2021). Patients interviewed desired a customized list of rehabilitation programs, exercise options, meal/grocery delivery, and medical transportation in their city filtered by cost and insurance coverage. Connecting users directly to these local health and wellness services can help overcome cost and transportation limitations frequently mentioned as challenges during the interviews.

6. **Customizable pain monitoring:** Interviews revealed chronic pain as a major struggle for patients after osteoporotic fractures. Patients wanted tools to easily track pain levels, locations, triggers, and effects of treatments over time. For example, noting increased back pain while gardening or less acute pain after trying acupuncture. Patients expressed interest in visualizing pain patterns to better discuss with doctors. Consistent pain tracking improves detection of pain exacerbators and evaluation of therapies (Chaudhry, 2016). Patients interviewed desired customizable graphs and charts to visualize their pain trends and quickly flag worsening issues to clinicians. Additionally, observational findings of patients wincing and rubbing fracture areas when recalling pain underscore the need for simple pain logging to accommodate physical limitations. By enabling patients to document detailed, longitudinal pain data, they can gain insights to optimize medications, exercises, lifestyle factors and complementary approaches for personalized pain management.

7. **Mental health screening and counselling resources:** Interviews revealed patients' struggles with motivation and isolation after osteoporotic fractures. Observations of patients becoming emotional when discussing loss of independence further indicate mental health impacts. Users require integration of healthy coping strategies and counselling services like mindfulness, journaling and goal-setting exercises. A study highlights how addressing psychosocial health through screening facilitates early intervention and improves rehabilitation outcomes (Colizzi et al., 2020). Patients wanted effortless access to emotional health resources from the convenience of home. Integrating mental health screening and follow-up care can help users manage anxiety during recovery and adjustment to disability after fracture

8. **Personalized exercise, diet and supplement plans:** Tailoring exercise, nutrition, and supplementation plans based on each user's unique status leads to improved adherence and outcomes (Lee et sl., 2016). Interviews highlighted patients' difficulties adhering to standardized rehabilitation protocols that did not account for individual capabilities and needs. Patients expressed wanting to collaboratively set customized goals based on their fracture risk, mobility levels, dietary habits, and motivations. For example, accommodating reduced arm strength or balancing nutrition goals with cultural diets. Observations revealed differences in patients' fragileness, endurance, and dexterity. Patients wanted easily accessible tools to develop specialized plans with their care team that adapt as their abilities change over time.

9. **Accessible user interface:** Interviews and observations revealed issues like reduced vision, hearing loss, and declined dexterity that impact usability and access. An accessible interface optimized for sensory, mobility, and cognitive limitations is critical. By proactively designing for the needs and limitations commonly associated with aging, the solution can maximize usability and empower self-management for elderly osteoporosis patients despite impairments (Alhussein et al., 2022). Users will feel comfortable interacting independently, ensuring continued adoption.

10. **Progress tracking incentives:** Interviews revealed patients' struggles with motivation during lengthy rehabilitation. The user group expressed interest in small rewards or reinforcement for hitting milestones like completing a week of exercises or achieving a mobility goal. Y.Y. suggested rewards like points or badges celebrating successes would improve their spirits and self-efficacy. It was observed that the other two patients were eager for small tangible prizes like healthy snacks or gift cards. Positive reinforcement can make the difficult process of rehabilitation more enjoyable (Trotter et al., 1968). Enabling users to track accomplishments could address the waning motivation observed. Simple incentives provide reasons to persist when progress plateaus.

11. **Privacy and Security Measures:** Interviews revealed users' hesitation to share intimate health details without certainty of data security. N.R. expressed concerns over tracking information like depression severity or movement capabilities being misused. Robust privacy and security measures that comply with healthcare regulations like PHIPA are essential to build user trust

(Paprica et al., 2020). Elderly users are more likely to adopt digital health tools when privacy protections are guaranteed. By prioritizing compliant security and providing patients oversight over data, they can feel comfortable tracking sensitive rehabilitation details knowing privacy is preserved. This enables transparent sharing with care teams for optimized outcomes.

The 11 requirements listed above provide valuable insight into possible features of a rehabilitation solution for this target demographic. However, these requirements must be taken into consideration with market research conducted when designing an effective solution.

Additional Factors Affecting Rehabilitation Success in Elderly Osteoporosis Patients

Even with a comprehensive solution meeting all identified user requirements, there are additional challenges unique to each elderly osteoporosis patient that can impact adoption and rehabilitation success. These individual factors should be considered to optimize outcomes and prevent setbacks. The key factors identified are:

Differences in physical attributes

- Bone density and fracture risk - Patients with more severe osteoporosis may be at higher risk for fractures and face greater activity limitations affecting rehabilitation participation.
- Baseline strength and balance - Patients with poorer initial physical functioning may progress more slowly and require more tailored goals.
- Pain tolerance - Patients vary in their ability to cope with chronic pain which influences adherence.

Differences in mental health

- Cognitive function - Patients with dementia or impaired executive function may struggle with self-management.
- Depression/anxiety - Low mood and emotional health affects motivation and recovery mindset.
- Self-efficacy - Patients with low confidence in their capabilities may doubt rehabilitation success.

Differences in social support

- Caregiver involvement - Lack of engaged support at home can hinder adherence and recovery.
- Transportation access - Patients without independent transport may miss appointments and exercise classes.
- Financial limitations - The cost of medications, supplies, classes can prohibit participation in rehabilitation programs.

Given the uncontrollable factors associated with osteoporosis in elderly patients, there exists a risk of setbacks in rehabilitation efforts. When designing a rehabilitation solution tailored for elderly

individuals managing osteoporosis, it is imperative to take these factors into account and develop strategies to minimize potential setbacks and relapses. To ensure the effectiveness of the rehabilitation program, a thorough assessment of the anticipated impact of the solution must be conducted, considering the unique challenges inherent in the aging process and osteoporotic conditions.

Conclusion

Through a mixed methods needs assessment, core requirements were identified to optimize rehabilitation outcomes for elderly osteoporosis patients. Three central themes emerged:

1) Accessible educational resources and remote tracking tools to facilitate self-management.
2) Engaging social features and incentives to motivate adherence.
3) Customized protocols and assistive devices to enable safe mobility and recovery.

Next steps will involve synthesizing these needs into personalized solution models that align to user goals. Conducting market research and benchmarking competitors will reveal opportunities to address unmet needs and limitations of current rehabilitation options. Ongoing engagement with elderly patients through co-design processes will enable rapid validation and refinement of solution prototypes. By continuing to put the user at the center and iterating based on feedback, we can develop an osteoporosis rehabilitation system that improves access, progress, and quality of life after fracture for the elderly.

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Appendix

Interview Questions for User Needs Assessment
Patient Name: S.B.

1. What is your age?
   72 years

2. When were you first diagnosed with osteoporosis?

   a) 1-2 years ago
   b) 3-5 years ago
   c) Over 5 years ago

   How has it impacted your health and mobility? Is this something you feel comfortable discussing? We can skip this question if you prefer.
   Increased dependence on son. Often gets disbalanced.

3. What type of injury or fracture have you experienced related to your osteoporosis?

   a) Wrist fracture
   b) Vertebral fracture
   c) Hip fracture
   d) Other fracture: Toe fracture
   e) No fracture

   When did this injury occur?

   a) 1-2 years ago
   b) 3-5 years ago
   c) Over 5 years ago

4. What types of rehabilitation did you do and how often?
   a) Physical therapy
   b) Occupational therapy
   c) Chiropractic
   d) Acupuncture
   e) Exercise at home

f) Other (please specify)
g) None

How often did you take part in these rehabilitation activities?

a) Daily
b) A few times a week
c) Once a week
d) Less than once a week
e) Never

5. What did you find most challenging about the rehabilitation process?

a) Pain
b) Transportation
c) Cost
d) Lack of motivation
e) Other (please specify)
f) No challenges

6. How motivated did you feel to stick to the recommended rehabilitation plan?

a) Extremely motivated
b) Very motivated
c) Somewhat motivated
d) Slightly motivated
e) Not motivated at all

What factors increased or decreased your motivation?
Insufficient knowledge of the rehabilitation procedures has decreased motivation

7. How closely did you track your rehabilitation progress?

a) Very closely
b) Somewhat closely
c) Not very closely
d) Did not track

What methods did you use and were they effective?

a) Paper log
b) Spreadsheet
c) Mobile app
d) Calender
e) Other
f) None

8. How knowledgeable do you feel about osteoporosis and fracture prevention strategies?
   a) Very knowledgeable
   b) Somewhat knowledgeable
   c) Slightly knowledgeable
   d) Not knowledgeable at all

   What education would be helpful?

   a) Understanding osteoporosis causes and risk factors
   b) Proper nutrition for bone health
   c) Effective exercise routines for osteoporosis
   d) Medication and supplement information
   e) How to prevent falls and fractures
   f) Other (Specify)

9. What types of technology do you currently use in your everyday life?
   a) Smartphone
   b) Tablet
   c) Laptop/Computer
   d) Smartwatch
   e) Other (Specify)

   How comfortable are you using new technology?

   a) Very comfortable
   b) Somewhat comfortable
   c) Neutral
   d) Somewhat uncomfortable

e) Very uncomfortable

10. Have you used any technology to help track your rehabilitation progress or get health education?

    a. Yes
    b. No
    c. If yes, please specify the technology used (e.g., mobile apps, wearable devices, online platforms).

11. If you could imagine an ideal system to help track and encourage your rehab progress, what would it include?

    a. User-friendly interface
    b. Personalized exercise plans
    c. Dietary tracking
    d. Educational resources
    e. Real-time feedback on exercises
    f. Other (Specify)

12. As discussed earlier, we are actively developing a comprehensive mobile application tailored to support senior citizens managing osteoporosis. This innovative app will provide tools for tracking rehabilitation progress, including physical exercise, dietary habits, and educational resources. Would you be interested in using such a mobile app to track your rehabilitation if it was designed to be senior-friendly?

    a. Definitely interested
    b. Somewhat interested
    c. Neutral
    d. Not very interested
    e. Not interested at all

13. If you used an app like this, how would you want to share the data - only with certain healthcare providers or caregivers? Or keep it private?

    a. Share with healthcare providers only
    b. Share with caregivers only

c. Share with both healthcare providers and caregivers
d. Keep it private

14. What features or functionality would make an app like this useful and easy to use for you?

a. Large font and clear visuals
b. Voice-guided instructions
c. Reminders for exercises and medications
d. Integration with wearable devices
e. Social support features (forums, peer connection)
f. Other (Specify)

15. What barriers or challenges do you think you might face in using a rehabilitation tracking app?

a. Technical difficulties
b. Difficulty navigating the app
c. Concerns about privacy and security
d. Limited access to necessary technology
e. Other (Specify)

Observational notes: Frequently requested questions to be repeated

Interview Questions for User Needs Assessment
Patient Name: Y.Y.

1. What is your age?
   67 years

2. When were you first diagnosed with osteoporosis?

   a) 1-2 years ago
   b) 3-5 years ago
   c) Over 5 years ago

   How has it impacted your health and mobility? Is this something you feel comfortable discussing? We can skip this question if you prefer.
   Not able to walk so just spend majority of the time on my bed and this has led to rapid weight gain

3. What type of injury or fracture have you experienced related to your osteoporosis?

   a) Wrist fracture
   b) Vertebral fracture
   c) Hip fracture
   d) Other fracture:
   e) No fracture

   When did this injury occur?

   a) 1-2 years ago
   b) 3-5 years ago
   c) Over 5 years ago

4. What types of rehabilitation did you do and how often?
   a) Physical therapy
   b) Occupational therapy
   c) Chiropractic
   d) Acupuncture
   e) Exercise at home
   f) Other (please specify)
   g) None

How often did you take part in these rehabilitation activities?

a) Daily
b) A few times a week
c) Once a week
d) Less than once a week
e) Never

5. What did you find most challenging about the rehabilitation process?

a) Pain
b) Transportation
c) Cost
d) Lack of motivation
e) Other (please specify)
f) No challenges

6. How motivated did you feel to stick to the recommended rehabilitation plan?

a) Extremely motivated
b) Very motivated
c) Somewhat motivated
d) Slightly motivated
e) Not motivated at all

What factors increased or decreased your motivation?
Not a big social circle, so feel less motivated

7. How closely did you track your rehabilitation progress?

a) Very closely
b) Somewhat closely
c) Not very closely
d) Did not track

What methods did you use and were they effective?

a) Paper log
b) Spreadsheet
c) Mobile app
d) Calender
e) Other
f) None

8. How knowledgeable do you feel about osteoporosis and fracture prevention strategies?
   a) Very knowledgeable
   b) Somewhat knowledgeable
   c) Slightly knowledgeable
   d) Not knowledgeable at all

   What education would be helpful?

   a) Understanding osteoporosis causes and risk factors
   b) Proper nutrition for bone health
   c) Effective exercise routines for osteoporosis
   d) Medication and supplement information
   e) How to prevent falls and fractures
   f) Other (Specify)

9. What types of technology do you currently use in your everyday life?
   a) Smartphone
   b) Tablet
   c) Laptop/Computer
   d) Smartwatch
   e) Other (Specify)

   How comfortable are you using new technology?

   a) Very comfortable
   b) Somewhat comfortable
   c) Neutral
   d) Somewhat uncomfortable
   e) Very uncomfortable

10. Have you used any technology to help track your rehabilitation progress or get health education?

    a. Yes
    b. No
    c. If yes, please specify the technology used (e.g., mobile apps, wearable devices, online platforms).

11. If you could imagine an ideal system to help track and encourage your rehab progress, what would it include?

    a. User-friendly interface
    b. Personalized exercise plans
    c. Dietary tracking
    d. Educational resources
    e. Real-time feedback on exercises
    f. Other (Specify)

12. As discussed earlier, we are actively developing a comprehensive mobile application tailored to support senior citizens managing osteoporosis. This innovative app will provide tools for tracking rehabilitation progress, including physical exercise, dietary habits, and educational resources. Would you be interested in using such a mobile app to track your rehabilitation if it was designed to be senior-friendly?

    a. Definitely interested
    b. Somewhat interested
    c. Neutral
    d. Not very interested
    e. Not interested at all

13. If you used an app like this, how would you want to share the data - only with certain healthcare providers or caregivers? Or keep it private?

    a. Share with healthcare providers only
    b. Share with caregivers only
    c. Share with both healthcare providers and caregivers
    d. Keep it private

14. What features or functionality would make an app like this useful and easy to use for you?

    a. Large font and clear visuals
    b. Voice-guided instructions
    c. Reminders for exercises and medications
    d. Integration with wearable devices
    e. Social support features (forums, peer connection)
    f. Other (Specify)

15. What barriers or challenges do you think you might face in using a rehabilitation tracking app?

    a. Technical difficulties
    b. Difficulty navigating the app
    c. Concerns about privacy and security
    d. Limited access to necessary technology
    e. Other (Specify)

Observational notes: Winced and rubbed her back when recalling a vertebral fracture

Interview Questions for User Needs Assessment
Patient Name: N.R.

1. What is your age?
   77 years

2. When were you first diagnosed with osteoporosis?

   a) 1-2 years ago
   b) 3-5 years ago
   c) Over 5 years ago

   How has it impacted your health and mobility? Is this something you feel comfortable discussing? We can skip this question if you prefer.
   Can no longer go on trekking which is a hobby. Have to be dependent on grandchildren for buying few things.

3. What type of injury or fracture have you experienced related to your osteoporosis?

   a) Wrist fracture
   b) Vertebral fracture
   c) Hip fracture
   d) Other fracture:
   e) No fracture

   When did this injury occur?

   a) 1-2 years ago
   b) 3-5 years ago
   c) Over 5 years ago

4. What types of rehabilitation did you do and how often?
   a) Physical therapy
   b) Occupational therapy
   c) Chiropractic
   d) Acupuncture
   e) Exercise at home
   f) Other (please specify)

g) None

How often did you take part in these rehabilitation activities?

a) Daily
b) A few times a week
c) Once a week
d) Less than once a week
e) Never

5. What did you find most challenging about the rehabilitation process?

a) Pain
b) Transportation
c) Cost
d) Lack of motivation
e) Other (please specify)
f) No challenges

6. How motivated did you feel to stick to the recommended rehabilitation plan?

a) Extremely motivated
b) Very motivated
c) Somewhat motivated
d) Slightly motivated
e) Not motivated at all

What factors increased or decreased your motivation?
Motivation from friends who suffer from osteoporosis

7. How closely did you track your rehabilitation progress?

a) Very closely
b) Somewhat closely
c) Not very closely
d) Did not track

What methods did you use and were they effective?

a) Paper log
b) Spreadsheet
c) Mobile app
d) Calender
e) Other
f) None

8. How knowledgeable do you feel about osteoporosis and fracture prevention strategies?
   a) Very knowledgeable
   b) Somewhat knowledgeable
   c) Slightly knowledgeable
   d) Not knowledgeable at all

   What education would be helpful?

   a) Understanding osteoporosis causes and risk factors
   b) Proper nutrition for bone health
   c) Effective exercise routines for osteoporosis
   d) Medication and supplement information
   e) How to prevent falls and fractures
   f) Other (Specify)

9. What types of technology do you currently use in your everyday life?
   a) Smartphone
   b) Tablet
   c) Laptop/Computer
   d) Smartwatch
   e) Other (Specify)

   How comfortable are you using new technology?

   a) Very comfortable
   b) Somewhat comfortable
   c) Neutral
   d) Somewhat uncomfortable

e) Very uncomfortable

10. Have you used any technology to help track your rehabilitation progress or get health education?

    a. Yes
    b. No
    c. If yes, please specify the technology used (e.g., mobile apps, wearable devices, online platforms).

11. If you could imagine an ideal system to help track and encourage your rehab progress, what would it include?

    a. User-friendly interface
    b. Personalized exercise plans
    c. Dietary tracking
    d. Educational resources
    e. Real-time feedback on exercises
    f. Other (Specify)

12. As discussed earlier, we are actively developing a comprehensive mobile application tailored to support senior citizens managing osteoporosis. This innovative app will provide tools for tracking rehabilitation progress, including physical exercise, dietary habits, and educational resources. Would you be interested in using such a mobile app to track your rehabilitation if it was designed to be senior-friendly?

    a. Definitely interested
    b. Somewhat interested
    c. Neutral
    d. Not very interested
    e. Not interested at all

13. If you used an app like this, how would you want to share the data - only with certain healthcare providers or caregivers? Or keep it private?

    a. Share with healthcare providers only
    b. Share with caregivers only

c. Share with both healthcare providers and caregivers
d. Keep it private

14. What features or functionality would make an app like this useful and easy to use for you?

a. Large font and clear visuals
b. Voice-guided instructions
c. Reminders for exercises and medications
d. Integration with wearable devices
e. Social support features (forums, peer connection)
f. Other (Specify)

15. What barriers or challenges do you think you might face in using a rehabilitation tracking app?

a. Technical difficulties
b. Difficulty navigating the app
c. Concerns about privacy and security
d. Limited access to necessary technology
e. Other (Specify)

Observational notes: Encountered trouble remembering his medication regimen