

Interview Report

Set 1, group 10

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Chapter 3.1

Research Questions:

1. What are the issues with finding correct push-up techniques?
 - What issues are experienced at certain levels of doing push-ups?
 - How is the lack of knowledge about push-up form addressed?
 - What are the issues in the current technologies for performing push-ups?
 - Why do people stop performing push-ups?
 1. If not, do they still have any problems with them?
 - What kind of discomfort/injury do people experience while performing push-ups?
2. How can people benefit from the use of technology to prevent injuries/discomfort while performing push-ups.
 - What kind of technologies do people already use?
 - Did people succeed in correcting bad habits in push-up posture with current technologies?

Interview methodology:

In total we conducted the interview for seven participants. We tried to find a diverse mix of participants so that we covered a broad age and genders range. In the end we interviewed three females and four males, with the following ages: 24, 20, 18, 32, 31, 23 and 21. Of these participants, three were classified as intermediate stakeholders, the others as beginner stakeholders, while one was difficult to place into either beginner or intermediate.

For males in our age group, beginners are considered to perform 0 till 41 regular push ups, with 41 or more push-ups being either intermediate or advanced. For females in the same age range, beginner is considered 0 till 18 regular push-ups, with everything above being considered intermediate/advanced for our stakeholders. (These thresholds are based on a research conducted among more than 2.1 million users of a fitness app). Additionally, we argue that completing ten archer push ups classifies someone as intermediate and the same goes for 20ish diamond push ups, as these variations are significantly more challenging than regular push-ups.

For actually conducting the interviews we used three different methods. We held three of the seven interviews in real life on campus. During these interviews one group member asked the question, with another group member supporting in the case that a follow up question could be asked, or the first member missed a question. Then a third group member was there to take minutes of the interview. We also made audio recordings of these interviews to make sure that we didn't miss any important information or that the scribe couldn't keep up. For the other interviews, one was done on a video call and the other three were filled in by the interviewee via an online survey.

For all interviews the questions, order and amount of questions were exactly the same. We started by asking them their age, gender and if they (in the past) competed in any sports. This gave us a general outline of the person and made it possible to group them. After this we started

by asking them some introductory questions, which were mainly about if they practiced push ups and if so how many they could do. The last one was important for us because this made it possible for us to place them into either the beginner or intermediate category. After that the questions were more focused on struggles they may or may not have experienced while doing push-ups. After that they were about technology in combination with their training, if they used any, what their experience with them was and what they liked/disliked. We finally asked them what their ideal push-up training solution would look like and if they had anything else they wanted to let us know.

Interview plan (*Questionnaire*)

Introduction

1. Do/did you (regularly) do push-ups, if so for how long and how often?
2. What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)
3. Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)

Understanding of the correct push-up technique

4. How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)
5. If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)
6. How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)

Issues at different levels

7. What challenges did you face when you started doing push-ups?
8. As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)
9. Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)

Discomfort / injuries

10. Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)
11. If yes, what do you think caused this and what did you do to address it?
12. If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?
13. Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)

14. What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)
15. Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?
16. Have you tried to address these issues? If yes, what did you try and how successful was it?

Use of technology

17. Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?
18. What features did you like or dislike about them?
19. Did the item provide (accurate and) useful feedback on your form? (e.g. it could, or could just count reps)
20. Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?
21. Were there any features that you really liked or that you specifically missed in the technology used?
22. What would an ideal push-up training solution look like for you? (think about what features you would like, how the system would be used, size, etc?)
23. Anything else you would like to let us know?

Chapter 3.2 (Results)

1. Challenges with learning and maintaining proper form

Many participants highlighted difficulties in learning proper push-up techniques and maintaining form. They often lacked confidence in their technique and struggled to self-monitor effectively.

"You feel something is going wrong, but it's difficult to know what." (Interviewee 1)

"I just read an article. The guidance was proper, but after all, I still didn't know if I was doing them right." (Interviewee 2)

These struggles appeared due to a lack of feedback or tools to provide clear, real-time guidance. Even when participants tried methods like mirrors or recordings, these were not always effective in ensuring consistent form.

2. Form-related discomfort

Discomfort and injuries were a recurring concern, often linked to poor form or fatigue during exercise. Participants mentioned wrist pain, back strain, or muscle discomfort when they began doing push-ups or pushed themselves to higher reps.

"At first, it was only shoulder pain, but then my wrists started hurting too." (Interviewee 2)

“I did experience a bit of back strain when I was still struggling with my form.” (Interviewee 3)

Several participants noted that correcting their form earlier or having better guidance could have mitigated these issues.

3. Motivation and consistency challenges

A lack of motivation was a significant barrier for several interviewees, either due to boredom, lack of measurable progress, or fear of injury. The absence of a structured routine or external accountability also played a role in interviewees stopping their push-up practice.

“Boredom and lack of motivation.” (Interviewee 3)

“I found it hard to motivate myself to do them at all.” (Interviewee 4)

“Something similar to video games which are never boring” (Interviewee 5)

Several participants noted that some competitive aspect could have helped them maintain consistency.

4. Simplicity in technological solutions

Interviewees showed interest in incorporating technology but emphasized the need for simplicity and ease of use. While some appreciated apps that tracked progress, they found that feedback on form and personalized guidance were missing.

“Simple to use, not too bulky, so it doesn’t take up much space.” (Interviewee 1)

“It should contain tips based on skill level and tutorial videos to go with it.” (Interviewee 3)

There was a shared preference for systems that offer useful feedback and avoid overwhelming users with unnecessary complexity or data.

Chapter 3.3 (Reflect and Iterate)

Reflection

Many interviewees mentioned that the technological solution should be easy to use, useful in terms of feedback and not too bulky. All of our concepts imply easiness in use, however, for example, with EMG sensors or suit, at first, it might be a bit difficult to get used to them, but in the end, easiness is mostly determined by the amount of feedback user gets from the system, so our goal is not to pile up everything on user, but to give only the essential information, which can be achieved with every concept.

So, these are the things worth consideration for each concept:

1. **Camera(s):** Incorporate motivational features like progress tracking or optional gamified elements alongside real-time feedback, as many interviewees have lacked motivation. Also, the optional (s) in the name of the concept should be omitted, because 2 cameras might be bulky and not easy to use.
2. **Suit:** Focus on lightweight, modular components that are intuitive to use and easy to share among users.
3. **Immediate video:** Add progress indicators and portable, adjustable design to improve usability and engagement.
4. **Weight/EMG sensors:** Simplify feedback to avoid overwhelming users while ensuring actionable insights.
5. **Gamification:** This concept fulfills the requirements of users; however, it might be the most difficult to implement.

Answers to research questions

A few sub-questions needed to be answered by the interview question in order to find an answer to our first main research question: “What are the issues with finding correct push-up techniques?”. The corresponding sub-questions and answers are the following:

- “What issues are experienced at certain levels of doing push-ups?”
We interviewed people from beginner to intermediate level, because this is our target group. The beginners reported issues like not knowing if their form is correct throughout the whole exercise, lack of strength, boredom/lack of motivation or some kind of injury/discomfort. Intermediates also reported issues with finding the correct form themselves and injuries/discomforts. Besides that, they also reported experiencing a plateau in their performance level and finding a good balance between paying attention to their form and targeting the correct muscle groups.
- “How is the lack of knowledge about push-up form addressed?”
Interviewees reported multiple ways to address the lack of knowledge about push-up form: some watched tutorials/read articles and compared themselves with this by looking in the mirror and some learned by getting feedback from a personal trainer or watching the performance of friends/family.
- “What are the issues in the current technologies for performing push-ups?”
People reported still not knowing for sure if their form was correct or that they felt like they did something wrong but could not figure out what exactly.
- “Why do people stop performing push-ups?”
All interviewees, who have stopped performing push-ups, reported that this was either due to lack of motivation/boredom or some kind of injury/discomfort.
There were also people who did not stop performing push-ups. They reported still experiencing discomfort during push-ups.
- “What kind of discomfort/injury do people experience while performing push-ups?”
People reported pain in their shoulder, back, wrist, chest, neck and/or muscles.

These sub-questions together provided us with an answer to our main research question: The most common issues with finding correct push-up techniques are due to the lack of specific personal feedback. Furthermore, an answer to our second main research question, “How can people benefit from the use of technology to prevent injuries/discomfort while performing push-ups?”, could be provided by the following sub-questions:

- “What kind of technologies do people already use?”
People use tutorials and articles that are provided online. Furthermore, an interviewee also reported using a push-up app to keep track of the number of push-ups performed.
- “Did people succeed in correcting bad habits in push-up posture with current technologies?”
People reported to have been able to better their form by the use of tutorials/articles to some extent. However, this did not secure them enough about whether their form was actually correct, and discomforts/injuries were still experienced.

These answers lead to the conclusion that people do benefit from the current technology, but not enough to actually prevent injuries/discomforts while performing push-ups.

Chapter 3.4 (Final Concept Selection)

After hours of brainstorming, after analyzing all possible problems and redefining all the concepts, after conducting all the interviews we have decided the best way to solve the current push-ups problems is by implementing **the suit**. Even though other concepts also would solve the specified problems, we have several reasons for choosing the suit:

- **Accuracy:** The suit provides the best accuracy, since it uses 17 sensors across the whole body and provides exceptionally high-quality mocap data. In this way we can monitor all the angles between body parts and be sure that the program will notify the user if some angles deviate from the normal ones
- **Usability:** Even though it is easier just to put the camera in front of you, it is not so easy to find such a position where the camera will be able to detect all your movements with the necessary accuracy, you need to be sure that it is on the right distance, you have no obstacles between and there is enough light in the room. With the motion capture suit, you just need to put on all its parts, and here you are ready for the training session.
- **Durability:** Due to its elastic material, the suit is reliable enough to survive a fall from a shelf or if someone sits on it, whereas other concepts include more fragile equipment and require careful handling.
- **Complexity of the implementation:** Unlike the cameras, the suit is not the easiest concept to implement, but it is at least doable. First of all, we are not sure if the university can provide us with necessary amounts of weight and EMG sensors, but even more importantly, there is not enough data to train an accurate model based on indicators from these sensors. Gamification will take a lot of time and effort to implement, so it is almost impossible to complete in the allotted time. At the same time, the suit does not have so many obstacles while remaining challenging enough.
- **Interview analysis:** After the analysis, we were convinced that the suit is going to cover most of the users' needs, since it solves the main problem of the current technologies: "Users are still not knowing for sure if their form is correct during the entire exercise". With our suit, people will not question this anymore, because, due to the great accuracy of this concept, the answer will be given even before they think about it. It not only speeds up progress and helps avoid injuries but also increases motivation since with our system they are sure that they are on the right track.

Appendix 2

Interviews

1.

Age: 24

Gender: Male

Practiced sports: Fitness

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	Yes, 3 times a week for roughly 3x12reps
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	Getting more in shape, just for general health and strength
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	Maybe starting intermediate, I'm pretty strong but not really built for push-ups. (max. 40ish consecutive reps of regular push-ups, didn't try anything else.)

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	Looking at videos and looking at myself in the mirror in the gym. I did find it helpful but it was annoying to tilt my head in order to see myself.
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	Paying attention to prevent doing it wrong and simultaneously targeting the right muscle groups.
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	Just visualizing, but this may not always be possible. My vision of correct form is used on tutorials that I saw on YouTube.

Issues at different levels:

Question	Answer:
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What challenges did you face when you started doing push-ups?	Not knowing the form, and once I saw some tutorial videos it's still difficult to apply it to yourself. You feel something is going wrong but it's difficult to know what.
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	Yes, after I was able to have good form most of the time, I got the problem that that proper form was way heavier than doing it with bad form. And because of this it was difficult to increase the number of reps. Also says that he was afraid to go to another type of push up, because he was uncertain if the form would work (didn't want to learn new again).
Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	Yes, I did notice a plateau. I guess it is because of a lack of progress in the number of push-ups. I am not sure what the direct cause was.

Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	Yes, I have experienced Back strain in the complete beginning and later on I had tiredness. This caused his form to worsen when he got more tired
If yes, what do you think caused this and what did you do to address it?	Just not being strong enough but really trying to keep proper form at all times.
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	The back strain would've been a problem for less time if I was able to learn the form quicker. The tiredness was just based on strength. Maybe I would've progressed quicker in strength (thus solving tiredness quicker) if I knew for certain that my form was correct.

Reasons for stopping push ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	Have stopped because of health, felt lower back pain after doing more push-ups then intended to do.
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	Better physique, be more in shape, doing it with friends, so doing it in a group experience, doing it with someone/more than 1

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	Not really, I am at the moment also not pushing to really improve that much in my push-up amount.
Have you tried to address these issues? If yes, what did you try and how successful was it?	N/A

Use of technology:

Question	Answer
Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	Never used smart device (didn't see any interesting ones advertised anywhere) Only a simple counting app to keep track of numbers over time.
What features did you like or dislike about them?	I liked that I could graph my number to see progress clearly over time.
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	No, it just stored information about the number of reps and possible notes added by me.
Did you feel like the technology actually helped you advance in any way? If yes, how did it help you? If not, what prevented it from helping you?	N/A (didn't use any that way)
Where there any features that you really liked or that you specifically missed in the technology used?	I didn't really miss it but feedback on the form would be nice, to for example tackle my tiredness problem quicker.

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	Simple to use, not too bulky so that it doesn't take up much space. It should also give clear concise feedback, nothing with a big number of whole alinea's of text.
Anything else you would like to let us know?	I didn't like to go in a technological suit to do push-ups, it might be too big of a step to use it. In person it is not helpful for personal trainers, however while working remote it might be useful.

2.

Age: 20

Gender: Male

Practiced sports: Gym (a bit), swimming

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	I used to practice them some time ago, for 3-4 months, I guess. One time per 2 days.
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	Fitness goals and I thought some sport would be useful for mental health also.
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	Intermediate +- 35 max in usual push-ups Archer push-ups

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	I just read an article. The guidance was proper but after all I still didn't know if I was doing them right.
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	I don't know if my form is right throughout the whole exercise. But it is definitely harder to keep it on higher reps.
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	I tried mirror and recording on phone but wouldn't say it was really useful.

Issues at different levels:

Question	Answer:
What challenges did you face when you started doing push-ups?	Not knowing if the form is correct
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	Besides more pain, I guess I didn't.

Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	Yes, Hindu push-ups were a struggle. I think I was not ready for them.
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Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	At first it was only shoulder pain, but then my wrists started hurting too.
If yes, what do you think caused this and what did you do to address it?	I think the wrong technique or not warming up properly might have caused it. Didn't really do much to address it.
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	I guess a proper warm up would have helped.

Reasons for stopping push ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	When shoulder discomfort became stronger.
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	Being sure that it has more benefit than harm.

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	Lack of motivation and past shoulder pain.
Have you tried to address these issues? If yes, what did you try and how successful was it?	I didn't

Use of technology:

Question	Answer
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Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	I haven't
What features did you like or dislike about them?	-
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	-
Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?	-
Were there any features that you really liked or that you specifically missed in the technology used?	-

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	A feature should be related to injuries somehow. It should prevent more pain by telling how to do the exercise. Of course, it also should not be too bulky or expensive.
Anything else you would like to let us know?	-

3.

Age: 18

Gender: Male

Practiced sports: Running and football

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	10-20 reps a few times a week
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	I started mainly to challenge myself with something I was able to do everywhere.
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	Beginner, I'm barely able to do 10 regular push-ups in a row.

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	From my brother mainly, he got it from experience and YouTube videos.
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	I don't really struggle with the consistency of my form anymore. At some point I do start to struggle a lot. So yes, keeping form on higher reps is a struggle.
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	Nothing.

Issues at different levels:

Question	Answer:
What challenges did you face when you started doing push-ups?	Strength mainly.
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	All of the listed ones a little, but not to the amount that it really hindered me a lot. I think I experienced it the way everybody would.

Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	Didn't really, but I don't have a specific goal at the moment, so I'm also not really able to be aware of any possible plateau.
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Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	I did experience a bit of back strain when I was still struggling with my form (occasionally this comes back again) and I still have wrist pain every now and then.
If yes, what do you think caused this and what did you do to address it?	I think my back strain was simply because of overcompensating to try and have proper form. The wrist pain I still don't really know. I did look up some videos on it, but they didn't work since I still experienced it.
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	The back strain would've been prevented as soon as I was able to have proper form. So, anything that made it possible for me to learn this quicker would've helped.

Reasons for stopping push-ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	Boredom and lack of motivation
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	Having someone to push me, to have something like a competition going on.

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	Occasional wrist pain.
Have you tried to address these issues? If yes, what did you try and how successful was it?	As I said, I watched some videos on it, but they didn't help.

Use of technology:

Question	Answer
Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	None
What features did you like or dislike about them?	N/A
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	N/A
Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?	Didn't use any so not applicable, however I do think it could help in a way.
Where there any features that you really liked or that you specifically missed in the technology used?	N/A

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	It should contain general tips based on skill level and tutorial videos to go with it. Also, for the competition I previously mentioned some kind of multiplayer game feature to compete. Also, something like a day streak counter could work really motivating.
Anything else you would like to let us know?	no

4.

Age: 32

Gender: Female

Practiced sports: Box training and general fitness (in the past running)

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	Sometimes, something like 5 sessions of 3 minutes each once a week.
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	It is part of the exercise routine during my box training (I participate in a group training with a training partner, a friend of me).
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	beginner

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	Just doing them during the training and having the trainer give comments where necessary.
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	I struggle with form a lot, mainly with having it consistent.
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	I have a training partner that gives feedback if she thinks I'm doing something wrong. If I struggle a lot on a particular day, I sometimes ask the trainer to come over.

Issues at different levels:

Question	Answer:
What challenges did you face when you started doing push-ups?	I found it hard to motivate myself to do them at all.
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	I can't really think of any.

Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	N/A
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Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	I don't really find push-ups comfortable at all, I experienced all the listed things. Pain mainly around my chest.
If yes, what do you think caused this and what did you do to address it?	I think it is because I'm not strong enough.
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	Not that I can think of, but I would guess that most problems were caused by improper form as well.

Reasons for stopping push-ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	I don't do them besides the training sessions.
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	Maybe I would do them if I was able to do them better. At the moment I'm just not motivated at all and slightly afraid to get hurt.

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	The same as said above.
Have you tried to address these issues? If yes, what did you try and how successful was it?	I didn't try anything specific. I got some help from my son and as said trainer/training partner but that is all.

Use of technology:

Question	Answer
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Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	No, I didn't use any. I also don't think that it is really applicable since the sessions are only around 3 minutes to fairly short.
What features did you like or dislike about them?	N/A
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	N/A
Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?	N/A
Where there any features that you really liked or that you specifically missed in the technology used?	N/A

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	Easy to use is often the most important for me. And helping in preventing injuries would be great if possible!
Anything else you would like to let us know?	-

5.

Age: 31

Gender: Male

Practiced sports: Swimming, general fitness (including push-ups)

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	I used to do it for 5-10 minutes every day
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	Probably a partner to train with
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	Beginner - Intermediate (15 diamond push-ups)

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	I read a couple of websites and watched one tutorial, that was enough to understand the simplest technique
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	To use a proper technique until the last push-up
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	I just look back every time I feel that something goes wrong

Issues at different levels:

Question	Answer:
What challenges did you face when you started doing push-ups?	N/A
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	Continue with the training sessions even when you have not enough motivation
Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	Yes, but only because it was too boring and too hard to increase the difficulty

Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	When I was learning diamond push-ups, I felt a small discomfort in my wrist, but nothing more than that
If yes, what do you think caused this and what did you do to address it?	I put my hands in a wrong position during the diamond push-up
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	Yeah, if someone told me about the right technique during my first push-ups

Reasons for stopping push ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	Yes, most of the time I stopped because of boredom and lack of motivation, usually it was after a long pause
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	Something or someone or will make them a bit more fascinating

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	My neck hurts from time to time, because I need to look back to check if I do everything correctly

Have you tried to address these issues? If yes, what did you try and how successful was it?	No, I didn't try anything, since I feel this pain very rarely
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Use of technology:

Question	Answer
Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	No, but I would really like to find something that will motivate me to continue with the trainings
What features did you like or dislike about them?	N/A
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	N/A
Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?	N/A
Where there any features that you really liked or that you specifically missed in the technology used?	I didn't use any of them, but all of them seemed to be boring

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	I cannot tell you the exact solution, but it definitely should be something attention grabbing, to make the work out more entertaining. Something similar to video games which are never boring
Anything else you would like to let us know?	No

6.

Age: 23

Gender: Female

Practiced sports: Yes

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	Yes, 2-3 times a week, 3 sets of 10 reps.
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	To get stronger, no gym needed
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	Intermediate 10 archer push ups.

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	YouTube videos, no other guidance
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	Keeping my back straight when tired
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	I don't check much

Issues at different levels:

Question	Answer:
What challenges did you face when you started doing push-ups?	Not strong enough, bad form
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	Staying consistent

Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	Yes, got stuck at 20 reps, not sure why
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Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	Wrist pain
If yes, what do you think caused this and what did you do to address it?	Bad form, didn't address it properly
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	Can't think of anything

Reasons for stopping push ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	Yes, lack of progress
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	A proper challenge

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	Occasional wrist pain
Have you tried to address these issues? If yes, what did you try and how successful was it?	No, not really

Use of technology:

Question	Answer
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Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	No
What features did you like or dislike about them?	N/A
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	N/A
Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?	N/A
Where there any features that you really liked or that you specifically missed in the technology used?	N/A

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	Simple, real-time feedback, no expensive gear
Anything else you would like to let us know?	Nope

7.

Age: 21

Gender: Female

Practiced sports: biking

Introduction:

Question	Answer
Do/did you (regularly) do push-ups, if so for how long and how often?	I don't really do push-ups regularly, maybe a few a few times a year at a maximum.
What motivated you to start doing them? (e.g. fitness goals, someone's advice, challenges)	I just like to go along with friends if we are, for example talking about fitness or something.
Do you consider yourself a beginner, intermediate or advanced in push-ups? (pls provide your max reps and/or most difficult push-up exercise you can/could do)	Beginner, I can maybe do 3 regular ones.

Understanding of the correct push-up technique:

Question	Answer
How did you first learn how to do a push-up? Did you receive any guidance on proper form? (e.g. online video's, tutorials, trainers, apps)	Never really learned, I just copy my friends.
If you sometimes struggle with keeping proper form, what do you find the most challenging? (e.g. keeping form on higher reps, having a consistent form, etc)	N/A
How do you usually check if your form is correct? (e.g. mirrors, others' feedback, nothing, something else)	My friends give some feedback.

Issues at different levels:

Question	Answer:
What challenges did you face when you started doing push-ups?	N/A
As you progressed, did you notice new challenges? (e.g. increasing reps, maintaining form, avoiding fatigue)	N/A

Have you ever experienced a plateau in your performance? If yes, what do you think caused it? (e.g. getting stuck at certain rep range, not being able to advance to new push up type)	N/A
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Discomfort or injuries:

Question	Answer
Have you ever experienced discomfort or an injury while doing push-ups? Please also write it down if it was only once. (e.g. wrist pain, back strain, hurting shoulder, muscle pain (what muscle?), etc)	Sometimes it hurts my shoulder/chest.
If yes, what do you think caused this and what did you do to address it?	Probably just because I'm not that strong.
If applicable, could anything have helped you to tackle possible injuries or discomfort that you encountered more efficiently?	Didn't think about this.

Reasons for stopping push-ups:

Question	Answer
Have you ever stopped doing push-ups (temporary)? If yes, what was the reason for this? (e.g. injury, no progress, boredom, lack of motivation)	N/A
What would/could've motivated you to start again/continue doing push-ups consistently? (e.g. having someone to do them with, being sure you have the correct form, etc)	N/A

Ongoing problems despite continuing:

Question	Answer
Do you currently face any challenges or discomfort while performing push-ups? If yes, what are they?	N/A
Have you tried to address these issues? If yes, what did you try and how successful was it?	N/A

Use of technology:

Question	Answer
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Have you ever used any technologies, apps or gadgets to (try and) improve your push-up? If yes which ones?	N/a
What features did you like or dislike about them?	N/A
Did the item provide (accurate and) useful feedback or your form? (e.g. it could, or could just count reps)	N/A
Did you feel like the technology actually helped you advanced in any way? If yes, how did it help you? If no, what prevented it from helping you?	N/A
Where there any features that you really liked or that you specifically missed in the technology used?	N/A

Closing questions:

Question	Answer
What would an ideal push-up training solution look like for you? (think about what features u would like, how the system would be used, size, etc?)	N/A
Anything else you would like to let us know?	

<https://strengthlevel.com/strength-standards/push-ups/lb>