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Title: Iterative Development of an Innovative Smartphone-Based Dietary Assessment Tool, Traqq

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Author Questionnaire

- 1. Microscopy:** Does your protocol require the use of a dissecting or stereomicroscope for performing a complex dissection, microinjection technique, or something similar? **No**
- 2. Software:** Does the part of your protocol being filmed include step-by-step descriptions of software usage? **Yes**, all done
- 3. Interview statements:** Considering the COVID-19-imposed mask-wearing and social distancing recommendations, which interview statement filming option is the most appropriate for your group?

☒ Interviewees wear masks until videographer steps away (≥ 6 ft/2 m) and begins filming, then the interviewee removes the mask for line delivery only. When take is captured, the interviewee puts the mask back on. Statements can be filmed outside if weather permits.

- 4. Filming location:** Will the filming need to take place in multiple locations? **No**

Current Protocol Length

Number of Steps: 9

Number of Shots: 14

Introduction

1. Introductory Interview Statements

REQUIRED:

- 1.1. **Desiree Lucassen:** The developmental process of dietary assessment tools is often not or only partially described. Demonstrating the entire process substantiates the scientific underpinning and may benefit the development of comparable tools [1].

1.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

- 1.2. **Desiree Lucassen:** This protocol shows all the steps taken to develop the app, including an extensive screening of available scientific literature and existing tools, prototype building, and evaluation by experts and intended end-users [1].

1.2.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested b-roll: 2.2.1*

OPTIONAL:

- 1.3. **Desiree Lucassen:** This method provides insights into the do's and don'ts of the developmental process of dietary assessment tools for nutrition research as well as behavior change applications [1].

1.3.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested b-roll: 2.5.1*

- 1.4. **Desiree Lucassen:** Development of a tool like Traqq requires the involvement of multiple experts, such as nutritional researchers, dieticians, and IT personnel. Be sure to keep these experts engaged throughout the entire process [1].

1.4.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

Ethics Title Card

- 1.5. All the procedures including human participants were conducted in a non-invasive manner by means of mostly qualitative research methods

Protocol

2. Project Management

- 2.1. To manage a project in the Manager role, navigate to **traqq.idbit.net [1]** and use the administrator credentials to log into the backend of the application. Click **Go to projects** and click the arrow in the **View** column to select the desired project [2].
 - 2.1.1. WIDE: Talent at computer, opening website, with monitor visible in frame.
Videographer: Obtain several shots of talent typing on keyboard and clicking mouse to use as b-roll
 - 2.1.2. SCREEN: 62032_screenshot_2.1.2. 0:03 – 0:27
- 2.2. In the **Project Overview** page, click the **Participants** tab. When the **Participant Overview** screen appears, click **Add new participant** and enter the **Codename**, **Notes**, **Login ID**, and **Login Key** as appropriate and **Save** the file [1-TXT].
 - 2.2.1. SCREEN: 62032_screenshot_2.2.1. 0:02 – 0:26 TEXT: **Use Participant study ID as both codename and login ID**
- 2.3. To schedule invitations for each participant, click on the **Invitations** tab. In the **Invitation Overview** screen, click **Add new invitation [1]**.
 - 2.3.1. SCREEN: 62032_screenshot_2.3.1. 0:02 – 0:08
- 2.4. In the following screen, select a **Participant** and enter the **Period start time**, **Period end time**, **Opening time**, **Closing time**, **Survey URL**, **Notes**, and **Enable** as appropriate [1].
 - 2.4.1. SCREEN: 62032_screenshot_2.4.1. 0:02–0:29
- 2.5. To track the data collection via the **Calendar** tab, select a participant of interest from the dropdown menu. To track responses via the **Response** tab, select a participant of interest from the dropdown menu. To analyze the collected data, send a request via email to the administrator for a data export [1].
 - 2.5.1. SCREEN: 62032_screenshot_2.5.1. 0:02 – 0:27

3. Study Participation

- 3.1. To use the application as a Participant, download the freely available app onto a smartphone [1] and log in to access the app [2].
 - 3.1.1. WIDE: Talent downloading the software *Videographer: This step is important*
 - 3.1.2. SCREEN: 62032_screenshot_3.1.2. 0:02–0:21

3.2. After receiving an invitation, click the notification [1] and click the open invitation [2].

3.2.1. Shot of notification, then notification being tapped.

3.2.2. Shot of open invitation, then invitation being tapped.

NOTE: Shot 3.2.1 and 3.2.2 were filmed in one shot.

3.3. To enter the food item consumed, click **Add food item** and enter the name of the consumed item. The name of the item can be clicked if it appears while typing [1].

3.3.1. SCREEN: 62032_screenshot_3.3.1. 0:01–0:13

3.4. In the following screen, report the consumed amount, corresponding portion size description, eating occasion and/or time of consumption of the item [1]. After saving, repeat the entry until all of the consumed food items have been reported [2]. Then click **Send List** to submit the list [3-TXT].

3.4.1. SCREEN: 62032_screenshot_3.4.1. 0:00–0:27

3.4.2. Talent entering new food information *Videographer: This step is important*

3.4.3. SCREEN: 62032_screenshot_3.4.3. 0:02–0:12 TEXT: In case of a food record, the invitation automatically closes at EOD

Results

4. Results: Usability Evaluation

- 4.1. In this usability evaluation [1], a total of 22 subjects participated in think-aloud interviews [2]. Participants were between 22 and 70 years old, with a mean age of 48 years [3]. Thirty-six percent were men [4] and over 50% were highly educated [5].
 - 4.1.1. LAB MEDIA: Table 1
 - 4.1.2. LAB MEDIA: Table 1 *Video Editor: please emphasize Total (n=22) text*
 - 4.2.2. LAB MEDIA: Table 1 *Video Editor: please emphasize Mean age data row*
 - 4.2.3. LAB MEDIA: Table 1 *Video Editor: please emphasize Male (%) data row*
 - 4.2.4. LAB MEDIA: Table 1 *Video Editor: please emphasize on High (%) data row*
- 4.2. The majority of participants used an Android device [1] and almost all of the participants had over 1 year of experience with smartphone use [2].
 - 4.2.1. LAB MEDIA: Table 1 *Video Editor: please emphasize Android (%) data row*
 - 4.2.2. LAB MEDIA: Table 1 *Video Editor: please emphasize Longer than 1 year (%) data row*
- 4.3. The evaluation of the SUS score indicated a mean rating of 79 to 100 with a range between 40 to 100 [1]. Only 3 participants rated the app below 68% [2] and 13 rated it over 80%, suggesting that the app can be considered user-friendly [3].
 - 4.3.1. LAB MEDIA: Results SUS.png *Video Editor: please emphasize on grey graph bars*
 - 4.3.2. LAB MEDIA: Results SUS.png *Video Editor: please emphasize on graph bars below orange line for below-average usability*
 - 4.3.3. LAB MEDIA: Results SUS.png *Video Editor: please emphasize on graph bars on or above green line for excellent usability*

Conclusion

5. Conclusion Interview Statements

5.1. **Desiree Lucassen:** Traqq is the first flexible dietary assessment tool. By sharing the developmental protocol, we hope to assist and inspire fellow researchers who aim to develop comparable flexible tools [1].

5.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera. *Suggested b-roll: 3.4.1, 3.4.2*