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Evaluating the use of ecological momentary assessment within a digital health intervention for reminiscence: how do people living with dementia and their carers engage?

Courtney Potts, Raymond Bond, Assumpta Ryan, Maurice Mulvenna, Claire McCauley, Elizabeth Laird, Deborah Goode

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Abstract

Background: User interaction event logs provide rich and large datasets that can reveal valuable insights into how people engage with technology. Additionally, approaches such as ecological momentary assessment can be used to gather accurate real-time data in an individual's native environment by asking questions 'in the moment'.

Objective: The purpose of the study is to evaluate engagement and response to ecological momentary assessment questions using a case study of an app used by people with dementia and their carers for reminiscence. The overall goal of this research is to inform ecological momentary assessment use in app design.

Methods: A feasibility trial was conducted in which participants (n=56) used the app over a 12-week period. Half of the participants were people living with dementia (n=28) and half were carers (n=28) with an average age of 73 ± 13 (SD). Questions were presented to individuals at various points which they could chose to answer or dismiss. Presentation and dismissal rates for questions were explored over hours of the day and across trial weeks. Engagement and response to questions presented to users following reminiscence with photos, videos and music was investigated.

Results: Overall compliance with ecological momentary assessment was high, with 69.1% of questions answered when presented. Questions presented in the evening had the lowest dismissal rate. The dismissal rate for questions presented at 9pm (10%) was significantly lower compared to 11am (50%) (?2=21.4, P < .001). Dismissal rates were high at the beginning of the trial but decreased after a few weeks, for example, the dismissal rate in trial week 8 (10%) was significantly lower than in trial week 2 (55%) (?2=19.2, P < .001). Questions asked following reminiscence with personal media had the highest dismissal rate compared to generic photos, video and music (P < .001 for all). In contrast, questions asked after the user had listened to generic music had significantly lower dismissal rates compared to personal music, photos and videos (P < .001 for all).

Conclusions: The main limitation of our study was the generalisability of results to a larger population given the sample size, quasi-experimental design, and older demographic where half of participants were people living with dementia. However, this study shows that older people are willing to participate and engage in ecological momentary assessment. Based on this study we propose a series of recommendations for app design to increase user engagement with ecological momentary assessment. These include presenting questions after 8pm in the evening, only after the individual has been using the app for several weeks, and only if the user is not trying to complete a task within the app.

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Results: Overall compliance with ecological momentary assessment was high, with 69.1% of questions answered when presented. Questions presented in the evening had the lowest dismissal rate. The dismissal rate for questions presented at 9pm (10%) was significantly lower compared to 11am (50%) (χ^2_1=21.4, P<.001). Questions asked following reminiscence with personal media had the highest dismissal rate compared to generic photos, video and music (P<.001 for all). In contrast, questions asked after the user had listened to generic music had significantly lower dismissal rates compared to personal music, photos and videos (P<.001 for all).

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Keywords: Ecological momentary assessment; EMA; app; behaviour analytics; event logging; dementia; carers; reminiscence; reminiscing

Introduction

Digital health and wellbeing products such as health apps are becoming increasingly popular given that technology is ubiquitous in daily life. In addition to the data that users record using these platforms, all user interactions and events can be elusively logged to represent usage. Such user interaction or event logs provide rich and large datasets that can reveal valuable insights into how people engage with technology. This paper reports on a case study which explores user engagement with ecological momentary assessment (EMA) in an app designed for people living with dementia and their carers.

Dementia includes a group of symptoms associated with ongoing cognitive decline and is highly prevalent with around 50 million cases worldwide [1]. Within the UK, 1 in 6 people over the age of 80 have dementia and cases are projected to double by the year 2050 [2]. Dementia also has a wider

economic impact and is estimated to cost £26 billion a year in the UK alone [3]. Currently there is no treatment to prevent, cure or attenuate the progression of dementia. Pharmacological treatments such as anti-psychotic medication have been used to treat symptoms of dementia but with limited success and unwanted side-effects [4]. Therefore, non-pharmacological based interventions are increasingly considered in dementia care, such as reminiscence. Reminiscence has been defined as recall of event in a person's life either individually or with others [5]. The process of reminiscence can involve the use of prompts such as photographs, music and video to trigger memories that have a special meaning for a person. Engaging in reminiscence increases sociability, confirms personal identity and encourages feelings of self-worth [6,7]. A recent review found evidence that reminiscence for those living with dementia helped to enhance quality of life in care homes to some extent and benefited those who felt depressed in an individual setting [8].

There are many different techniques which can be used to gather accurate data on daily living, such as EMA or experience sampling methodology (ESM). These methodologies are used to capture real-time data in an individual's natural environment through repeated sampling [9]. This can include psychometric scales, open-ended questions, or anything else used to assess an individual's condition in that place and time. These approaches provide a high degree of ecological validity as they study people as they go about day-to day life [9]. As EMA requires participants to respond to questions 'in the moment', it avoids recall bias which makes it a useful tool for those with memory impairment such as people living with dementia. Traditionally, EMA made use of paper diary techniques but nowadays can utilise devices such smartphones or tablets to record digital data. Recently, EMA was used to identify major areas of concern for caregivers of persons with Alzheimer's disease with the overall goal to provide support and information for caregivers in their home [10]. Another study used ESM to examine the day-to-day burden of caregiving for dementia carers which could be used to tailor interventions to their individual needs [11]. However, there has been a paucity of research to date examining the use of EMA to sample data from people living with dementia as well as their carers.

A feasibility study was conducted in which participants used a digital health intervention, an app for reminiscence, at home for a trial period of 12 weeks. EMA questions on mutuality were presented to users at various points during the trial period whilst they were reminiscing using the app. We sought to address four research questions; 1) what is the temporal engagement with EMA questions over hours of the day and across the trial period? 2) How differently do people with dementia engage or respond to questions compared to carers? 3) How do people with dementia and their carers engage or respond to questions after engaging with video, audio and photos? 4) How do people with dementia and their carers engage or respond to questions after reminiscing with personal media compared to generic media? The aim of this study is to evaluate engagement and responses with EMA questions while using an app with the overall goal to inform EMA use within digital health interventions.

Methods

InspireD Study

In our previous work we developed an app for reminiscence which incorporated EMA for the Individual Specific Reminiscence in Dementia (InspireD) feasibility study. The study used a quasi-experimental design and investigated the use of an iPad app which allowed people living with mild to moderate dementia and their family carers to reminisce (Multimedia Appendix I). In phase one, a group of volunteers including carers and those living with dementia co-created, refined and developed the app for InspireD. The app allowed users to electronically collect and store personal and generic media in the form of music, photographs and videos. Phase two involved implementation which included training and use of the app with people living with dementia and their carers. Participants used the app at home for a period of 12 weeks. The primary outcome measure was the impact of reminiscence on mutuality [12] defined as the positive quality of the relationship between

caregiver and care receiver. The secondary outcome measures included well-being measured using the WHO-5 Well-Being Index [13] and quality of the relationship between the person living with dementia and their carer using Quality of the Carer Patient Relationship [14]. The third and final phase included individual interviews with participants to explore individual views on the intervention.

Reminiscing made up the largest proportion of total app interactions for people living with dementia (71%) and their carers (47%) [15]. Across both groups, there were more interactions with photographs in comparison to music and video [15]. The app was primarily used for reminiscence using personal multimedia content as opposed to generic photos and videos. [15]. The most popular times to use the app were around 11am, 3pm and 8pm corresponding to post-breakfast, post-lunch and post-evening mealtimes [15]. On average, a person living with dementia used the app about once per week over the 12-week trial period [15].

Participants living with dementia attained statistically significant increases in mutuality, quality of carer and patient relationship, and subjective well-being from the beginning to end of the study [16]. Additionally, unsupervised machine learning was used to identify behavioural clusters that characterised different user engagement with the InspireD app which was cross compared with qualitative data following interviews after the trial period [17].

Participants

The study received ethical approval in March 2016 (16/NI/0035) in line with regional and National Health Service Trust research governance. Ethical considerations principally pertained to voluntariness, supporting separate informed consent for the people living with dementia and their carers, handling and storage of data, and right to withdraw from the study. In this study, the person living with dementia and their family carer are referred to as a dyad. A total of 30 dyads were recruited to the study, however usage data was found to be corrupted in the iPad software used by two dyads (a total of four participants). Therefore, only the tracking data of 28 dyads (56 participants) has informed the analysis for the present study. The characteristics of the participants are shown in Table 1.

Table 1: Characteristics of participants in the InspireD study

Characteristic		All participants (N=56)	Person Living with Dementia (n=28)	Family Carers (n=28)
Age (years), mean (SD; range)		73 (13; 31-94)	79 (12.1; 61-94)	67 (13; 31-91)
Gender, n(%)				
	Male	24 (43)	18 (64)	6 (21)
	Female	32 (57)	10 (36)	22 (79)
Previous IT experience, n(%)				
	Little or none	33 (59)	23 (82)	10 (36)
	Some	19 (34)	4 (14)	15 (53)
	A lot	4 (7)	1 (4)	3 (11)

Each of the dyads were given an iPad and used the app at home for a 12-week period. Participants were encouraged verbally and in writing to use the app for a minimum of three times a week across the trial period. Information Technology (IT) training was provided on three occasions; two sessions

before the trial period began and one in the middle of the trial period in week 6. The purpose of the training was to provide guidance on how to use the app, how to upload media and general app support. The app recorded user event logs locally on each iPad using a SQLite database and later collected in person from the iPads using a pen-drive. Specific activities were recorded which fell under the categories of: Entry (logging in), Admin (adding or deleting photos/ video/ music), Reminiscing (viewing a photo/ video or listening to music), 'In the Moment' (EMA questions), and Exit (logging out). The app allowed individuals to upload their own photos, videos or music or access media online. For the purposes of this study generic media was defined as photos, videos and music that were accessed online through the app, for example a photograph of street where the individual lived as a child. Personal media was defined as media that was uploaded, such as an old family photograph.

EMA

The EMA questions were a subset of items derived from the Mutuality Scale [12] as shown in Table 2. These questions were presented to the user in a random sequence whilst they were using the app across the 12-week trial period. The EMA questions were presented at random whilst individuals were using the app, therefore questions were only presented when the app was already in use. Hence, no push notifications were sent when the app was not in use to encourage completion of EMA questions. Whilst the user was carrying out an action within the app (Multimedia Appendix II), a series of checks were carried out before an EMA question was displayed (Figure 1). The user could choose to answer the questions using Likert scale responses ("A great deal", "Quite a bit", "Some", "A little", "Not at all") or dismiss the question. This paper does not look at the actual responses, only whether the user chose to answer or dismiss the question.

Table 2: Items from the mutuality scale used to capture EMA data

Question Number	Question
1	*How attached are you {partners name}?*
2	*How much do the two of you laugh together?*
3	*How much do you confide in {partners name}?*
4	*How much do you enjoy sharing past experiences with {partners name}?*
5	*How much do you like to sit and talk with {partners name}?*

Data Analysis

R studio (version 3.6.0) and the R programming language were used for data wrangling and statistical programming. For the first part of the analysis, to look at overall engagement with questions the user log data were filtered to only contain 'In the Moment' data. Over the course of the 12-week trial period, a total of 832 questions were presented to the dyads as they were using the app. Of these questions, 77 were asked during training days and so were excluded from this analysis, leaving 755 questions asked during the trial period.

Engagement and Response to Questions

Data were aggregated by hour and trial week number to get count and dismissal rates overall and for people with dementia and their carers. In order to investigate engagement following reminiscence with media (photo, video, music) and specific media type (personal, generic) the last recorded activity the user completed before responding to the EMA question was used. Some media could not

be categorised into generic or personal media and was therefore only included in the media category "all". At this stage, 124 out of 628 (16%) EMA questions were filtered out of the data as the previous recorded event was an EMA question and not an action that could trigger a question (Multimedia Appendix II). The last recorded activity completed by the user before the EMA question appeared was used to explore the responses following 'other' app activity. Spearman's rank correlation coefficients were used for association analysis between variables, where $P<.05$ was considered statistically significant. Chi-squared tests were computed to compare the proportion of questions answered versus dismissed within each of the categories. Chi-squared pairwise comparisons were performed to compare dismissal rates across the different media types with Bonferroni correction to account for multiple testing.

Results

Five different EMA questions from the mutuality scale [12] were presented to people living with dementia and their carers (Table 2). There was a significant correlation between the number of questions presented and the number of interactions with the app (r=0.86, $P<.001$), with roughly one question asked for every ten app interactions. The overall dismissal rate for questions asked during the trial period excluding training days was 30.9%. Hence, 522 out of 755 (69.1%) questions were answered.

A breakdown of the presentation and dismissal for each question is shown in Table 2 along with chi-squared test results comparing the proportion of questions answered versus dismissed. The dismissal rates were significantly different from the answer rates for each question (Table 2). People living with dementia used the app more in the trial period than carers [15] but despite this had a lower dismissal rate for questions (121/451, 26.8%) compared to their carers (112/304, 36.8%).

Table 3: EMA questions presented and dismissed

Question		Presented	Dismissed	*P* value
Question Number, n(%)				
	1	197 (26.1)	48 (20.6)	<.001
	2	131 (17.4)	39 (16.7)	<.001
	3	116 (15.4)	38 (16.7)	<.001
	4	165 (21.9)	54 (23.2)	<.001
	5	146 (19.3)	53 (22.8)	<.001

Engagement and Response Across Hours and Trial Weeks

The questions presented per hour and trial week are shown in Figure 2. The fewest number of questions were presented between midnight and 8am (Figure 2). Most questions were presented late morning (between 10am-noon), late afternoon (2pm-4pm) and after dinner (7pm-9pm). A high number of questions were presented in trial weeks one and six, which is probably due to increased use of the app post IT training. This increase is consistent with increased app usage across weeks one and six, and there was a significant association between the number app interactions and the number of questions presented across trial weeks (r=0.84, $P=.0012$).

The dismissal rates across hours of the day and trial week are shown in Figure 3. When looking at questions across hours of the day; 11am, 4pm and 7pm had the highest dismissal rate (Figure 3). These hours also had a high volume of questions presented (Figure 2). Questions asked at 9pm and 10pm had the lowest dismissal rate meaning users were more likely to answer questions which were presented in the evening (Figure 3). For example, the dismissal rate at 9pm is significantly lower compared to 11am (χ^2_1=21.4, P < 0.001), in other words questions asked at 9pm are 5 times more likely to be answered compared to questions asked at 11am. The dismissal rate for questions was high at the beginning of the trial and in week 12 and was lowest in the middle of the trial (Figure 3). For example, the dismissal rate in trial week 8 was significantly lower than in week 2 (χ^2_1=19.2, P < 0.001).

The dismissal rates across hours of the day and across trial week for each user are shown in Figure 4. Over hours of the day, the dismissal rate for questions followed a similar pattern for both user types (Figure 4). There was a strong correlation between dismissal rate and hour of the day between people living with dementia and their carers (P<0.001, r=0.81) (Figure 4). Across trial weeks the dismissal rate between users differed. There was no correlation between dismissal rate and trial week number between people living with dementia and their carers (P=.092, r=0.51) (Figure 4).

There is a strong correlation between the number of questions presented and the number of questions dismissed per hour for carers (P<0.001, r=0.84) and people living with dementia (P<.001, r=0.83). From investigating the residuals, there are significantly less questions dismissed at the hours of 2pm, 9pm and 10pm for both carers and people living with dementia using these models. For both user types, questions asked in the evening were more likely to be dismissed than answered.

Engagement and Response to Questions Following Reminiscence

The total number of questions presented and dismissal rates following reminiscence with photo, video, and music overall and split up by personal or generic media are shown in Table 4. The highest number of questions were presented after users viewed photos, and the fewest after listening to music (Table 4). Personal media was used in the app more than generic media thus more questions were presented following reminiscence with personal media (Table 4). Pairwise chi-squared tests adjusted for multiple testing using Bonferroni correction were used to compare the dismissal rates for each question following reminiscence with all types of media, and then segregated into personal and generic media. Significantly more questions were dismissed after viewing any type of photo (88/256, 34.4%) compared to after listening to any type of music (34/176, 19.3%) (Table 4). The dismissal rate for questions asked after viewing personal photos (41/122, 33.6%) was significantly higher compared all music, music, all photos, photos and all video rate for questions after music (4/73, 5.5%) was compared to all music, photos all videos and These results show that following reminiscence especially photos were compared to other media. asked after the user had were much more likely to

Table 4: Question dismissal following different media

Media		Questions	*P* value
Photo, n (% dismissed)			<.001
	All	256 (34.4)	
	Generic	14 (15.4)	
	Personal	122 (33.6)	
Video, n (% dismissed)			.331
	All	57 (28.1)	
	Generic	2 (0)	
	Personal	11 (45.5)	
Music, n (% dismissed)			<.001
	All	176 (19.3)	
	Generic	73 (5.5)	
	Personal	39 (35.9)	

generic music, personal personal photos, generic (Table 4). The dismissal interacting with generic significantly lower personal music, all personal videos (Table 4). questions asked with personal media, less likely to be answered In contrast, questions listened to generic music be answered. presentation and reminiscence with

Engagement and Responses to Questions Following 'other' App Activity

Questions were also presented to users as they were completing 'other' activities as shown in Table 5 along with dismissal. Chi-squared tests were used to compare the proportion of questions answered versus dismissed for these activities. There were significantly more questions answered than dismissed when a person with dementia logged into the app (Table 5). All of the other activities had much higher dismissal rates but failed to reach significance.

Table 5: Question presentation and dismissal following other app activity

Activity (user)	Questions	*P* value
Login carer (carer), n (% dismissed)	14 (35.7)	.257
Login person living with dementia (person living with dementia), n (% dismissed)	20 (25.0)	.004
Add or delete photo (carer), n (% dismissed)	43 (51.2)	1
Exit app (carer or person living with dementia), n (% dismissed)	61 (42.6)	.148

Discussion

This study set out to explore engagement with EMA using a case study of a reminiscence app for people living with dementia and their carers. Overall engagement with EMA was high, with 69.1% questions answered when they were presented. Other studies have reported between 55 - 87% compliance with EMA questions in the general population [18]. Previous studies that have used EMA with older adults have generally relied on sending user notifications or alarms as reminders to complete questions [19,20]. In these cases, the most commonly reported reasons for not answering EMA included users being prompted at inconvenient times or when they were busy, not hearing alarms or not having their phone nearby at the time [19,20]. In our study, questions were asked only when the users where already using the app which eliminates some of the previously reported reasons for EMA non-adherence.

When trying to increase engagement with EMA, one important factor to consider is the frequency of administering questions. For example, if EMA questions are presented multiple times in one day it may become burdensome for the user and increase the chances of dismissal. In our study, people living with dementia and their carers were less likely to dismiss EMA questions asked at the hours 9pm and 10pm. This is similar to what we found in another study exploring the temporal behaviour of users completing EMA in a maternal health app, where users were more likely to complete mental health scales around 8pm or 9pm in the evening [21]. Additionally, dismissal rates around 9am, 2pm and 6pm were also low which corresponds to post-breakfast, post-lunch and post-evening mealtimes suggesting users are more likely to engage in questions during post-prandial reminiscence.

Dismissal rates for EMA after reminiscence with generic media were very low when compared to personal media. It has been shown that reminiscence with personal media is more likely to have positive psychosocial benefits compared to generic reminiscence material for people living with

dementia [22]. This would suggest that personal media provides a more meaningful reminiscence experience, and thus could explain why users were less likely to answer questions during this time. Importantly, our results suggest that asking questions following reminiscence with personal photos compared to other media types was likely to result in dismissal. We also found that users were less likely to dismiss EMA questions following reminiscence with generic music compared to video or photos. Cognitive function has been shown to be better in people living with dementia following music therapy [23,24]. Therefore, we suggest that participants were more likely to answer questions after listening to music as this was less cognitively demanding compared to viewing photos or video. Music therapy has been shown to have other benefits for people living with dementia, improving behavioural and psychologic symptoms and decreasing agitation [25–27]. This could also explain why participants were more likely to answer questions after listening to music.

When carers were adding or deleting photos the dismissal rate was high. Questions asked while users were trying to complete a task such as this could be a hindrance, therefore leading to higher dismissal of questions. Overall, both users were more likely to answer questions if they were asked less frequently so this should be taken into consideration going forward. Future work should look at the type of EMA questions being asked, for example it may be more beneficial to ask questions such as "Do you find reminiscence therapy helpful?" or "What is your favourite way to reminisce?" rather than scale questions. Alternatively, EMA could assess feedback on the user experience as this would provide co-design opportunities in the 'use' phase since most co-creation activities focus on initial design phases. These questions could help inform app design and gain valuable insight into user experience.

Ultimately, to increase engagement with EMA it is important to secure individuals as regular app users. There are several approaches which can be used to secure people as full adopters of an app, such as user notifications and prompts which can encourage app usage. These notifications could be released at the hours when individuals are likely to engage with EMA, such as in the evening at 9pm. Personalisation can also help to increase engagement, by tailoring an app to an individual. In our study, EMA questions from the mutuality scale incorporated the name of carer or person living with dementia for example "*How attached are you to {partners name}*?". Future work should continue to utilise these personalised aspects such as using individual names in personalised push notifications or in EMA questions.

Limitations

The main limitation of our study is the generalisability of results to a larger population given the quasi-experimental design and older demographic where half of the participants were people living with dementia. Due to the relatively small sample size it was not possible to attribute any findings to gender differences. Ideally sample size should be calculated for a randomised control trial to ensure adequate power. However the sample size for the present study (n=56) was deemed sufficient to meet the objectives of a feasibility study.

Another limitation was the recording of log data. User events were logged in real time and were later collected in person from the iPads using a pen-drive. As a result, we could not control for lost local data due to operating system failures, app crashes, bugs and updates. This was the case with some of the log data which was recorded. For 16% of all EMA questions asked the event which was logged previously was also an EMA question instead of one of the actions (Multimedia Appendix II) that should trigger a question being asked. To allow for remote event logging and to minimise data loss, it is important to follow best practices for the collection and storage of user log data, such as storing data in the cloud. This would enable the analysis of logs over the duration of the study. Remote logging could also facilitate the use of adaptive features to motivate people living with dementia and carers by sending personalised notifications and motivational messaging at moments of low app usage.

Conclusion

This study explored the engagement and responses to EMA questions using an app for reminiscence where the users were carers and people living with dementia. Our results show that older people are willing to participate and engage in EMA with almost 70% compliance. However, more can be done to increase engagement. Notwithstanding the limitations, based on this study we propose a set of recommendations for the use of EMA to optimise user engagement within a digital intervention. EMA questions should add value and help to validate the use of the digital health app in line with the study objectives. We propose that the EMA questions presented relate to the utility of the app in terms of its value for reminiscing to the user, and assessment of the mood of the user while reminiscing. The exact wording of these questions could be informed and co-designed by the intended user group, for example a focus group made up of people living with dementia and their carers. It is important that EMA questions do not distract or interfere with the overall purpose of the app which in the present study is to allow people with dementia and their carers to reminisce. To avoid over-prompting the user, no more than one question should be presented per day and ideally in evening after 8pm as this is when people were most likely to engage. If the user is trying to complete a task within the app such as adding content then a question should not be presented. These recommendations can be broadly applied to EMA use in similar settings. Future work will be carried out to study the engagement on a larger scale with more participants, which will further support these recommendations. Future work will also involve studying app usage patterns, for example if a user engages in an EMA question, when will they next engage and can we predict engagement based on user log analysis.

Acknowledgements

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Conflicts of Interest

None declared.

Abbreviations

EMA: ecological momentary assessment
ESM: experience sampling methodology
InspireD: individual specific reminiscence in dementia
IT: information technology

Appendix

Multimedia Appendix I: Screenshots of the InspireD app

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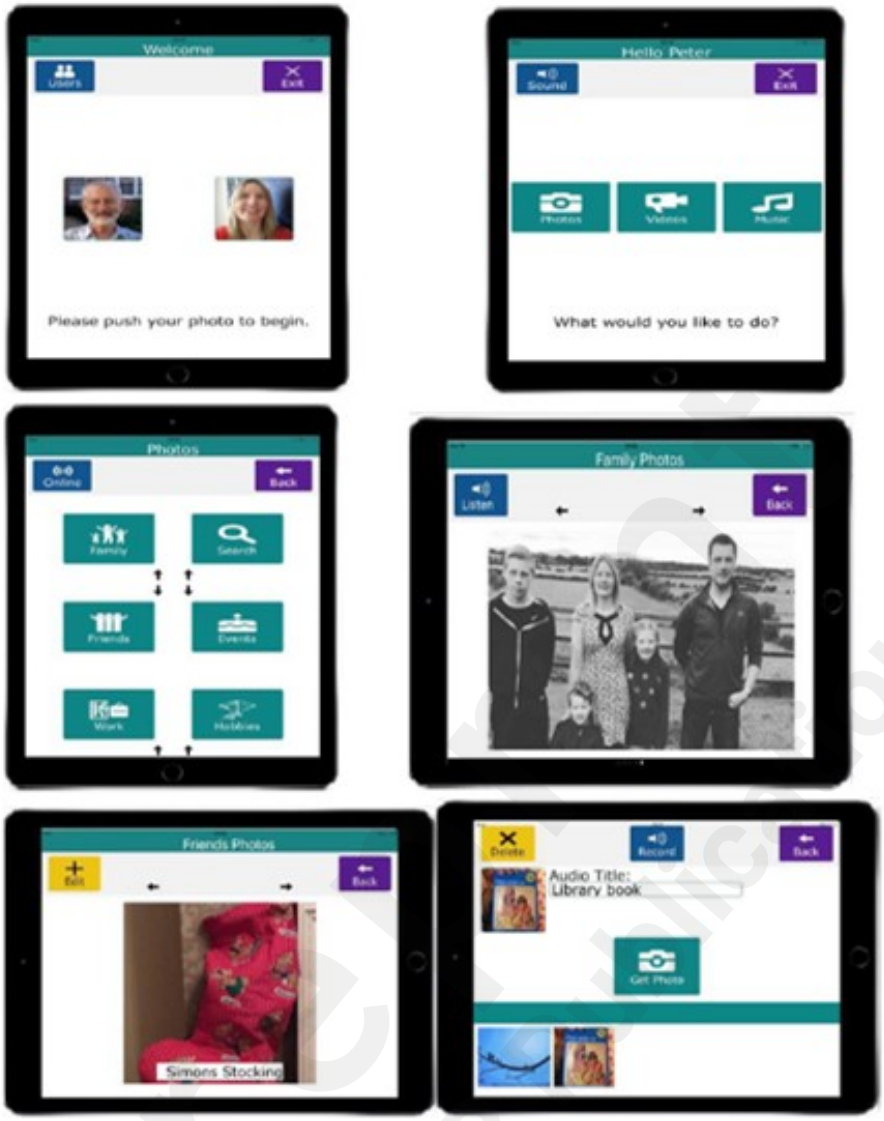

Multimedia Appendix II: List of actions completed by app users which could prompt an EMA question.

Actions	Description
AddEventsPhotos	Adding photo(s)
AddFamilyPhotos	Adding photo(s)
AddFriendsPhotos	Adding photo(s)
AddHobbiesPhotos	Adding photo(s)
AddOtherPhotos	Adding photo(s)
AddPlacesPhotos	Adding photo(s)
AddWorkPhotos	Adding photo(s)
audios	Listening to music
audiosAudioDeleted	Deleting music
AudiosNewAudioAdded	Adding music
EventsNewPhotoAdded	Adding photo(s)
EventsPhotoDeleted	Deleting photo(s)
EventsPhotoViewer	Viewing photo(s)
ExitApp	Exiting app

ExitAudios	Exiting music
ExitPhotos	Exiting photo(s)
ExitVideos	Exiting music
FamilyNewPhotoAdded	Adding photo(s)
FamilyPhotoDeleted	Deleting photo(s)
FamilyPhotoViewer	Viewing photo(s)
FriendsNewPhotoAdded	Adding photo(s)
FriendsPhotoDeleted	Deleting photo(s)
FriendsPhotoViewer	Viewing photo(s)
GenericAudio	Listening to music
GenericVideo	Watching video(s)
HobbiesNewPhotoAdded	Adding photo(s)
HobbiesPhotoViewer	Viewing photo(s)
LoginCarer	Logging in
LoginPersonWithDementia	Logging in
OnlinePhotoViewerInternetconnected	Viewing photo(s)
OtherNewPhotoAdded	Adding photo(s)
OtherPhotoDeleted	Deleting photo(s)
OtherPhotoViewer	Viewing photo(s)
PersonalAudio	Listening to music
PersonalVideo	Watching video(s)
PlacesNewPhotoAdded	Adding photo(s)
PlacesPhotoDeleted	Deleting photo(s)
PlacesPhotoViewer	Viewing photo(s)
SearchAllPhotos	Searching photo(s)
videosNewvideoadded	Adding video(s)
videosVideoDeleted	Deleting video(s)
WorkNewPhotoAdded	Adding photo(s)
WorkPhotoViewer	Viewing photos(s)

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