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Original article

Experiencias del cuidador familiar con la utilización de las Tecnologías de la Información y la Comunicación: implementación de una intervención educativa

Experiences of the family caregiver with the use of Information and Communication Technologies: Implementation of an educational intervention

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Resumen

Introducción: Las Tecnologías de la Información y Comunicación (TICs) son un recurso a través del cual los profesionales de la salud pueden proporcionar apoyo y asesoría a distancia.

Objetivo: Describir las experiencias de una cuidadora familiar (CF) con el uso de las TICs en la implementación de una intervención educativa como apoyo para su autocuidado y el cuidado del adulto mayor (AM).

Metodología: Estudio de caso con abordaje cualitativo. Una pasante de la licenciatura en Enfermería y Obstetricia implementó una intervención educativa en una CF del 15 diciembre 2020 al 25 junio 2021, periodo de pandemia por COVID-19. La recolección de datos se realizó a partir de entrevistas a profundidad, mensajes de texto y voz de WhatsApp, así como por observación. Se realizó análisis de contenido tipo temático según de Souza Minayo.

Resultados: Se identificó el teléfono celular como el dispositivo más utilizado, las funciones de videollamada y mensaje de voz de WhatsApp como las herramientas más útiles y preferidas por la CF, y las infografías y videos como los materiales educativos más adecuados para esta población.

Limitaciones: Solo se incluyó una CF y un AM, lo cual puede generar un sesgo de respuesta, ya que la CF quizás estuvo más motivada y dispuesta a participar que otros cuidadores hipotéticos.

Valor: Implementar un nuevo canal de comunicación entre el profesional de enfermería, el AM, la CF y otros familiares.

Conclusiones: El uso de las TICs fue aceptado por la CF para recibir capacitación en su autocuidado y cuidado del AM.

Palabras clave: cuidador familiar, adulto mayor, enfermeras, tecnología de información de la salud, celular.

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Abstract

Introduction: Health professionals can use Information and Communication Technologies (ICTs) to provide support and advice at a distance.

Objective: Description of the experiences of a family caregiver (FC) with the use of ICTs in the implementation of an educational intervention to support her self-care and the care of the Older Adult (OA).

Methodology: Case study with qualitative approach. An undergraduate intern in Nursing and Midwifery implemented an educational intervention with a FC from December 15, 2020 to June 25, 2021, during the covid-19 pandemic. Data collection was gathered with in-depth interviews, Whatsapp text and voice messages, as well as direct observation. Thematic type content analysis was performed according to de Souza Minayo.

Results: The cell phone was identified as the most used device, Whatsapp video call and voice message functions as the most useful and preferred tools by the FC, and infographics and videos as the most appropriate educational materials for this population.

Limitations: Only one female FC and one male OA were included in this study. This may generate response bias, as the FC was perhaps more motivated and willing to participate than other hypothetical caregivers.

Value: Implementation of a new communication channel between the nursing professional, the OA, the FC, and other family members.

Conclusions: Training in the use of ICTs was accepted by the FC to improve her self-care and care of the OA.

Keywords: family caregiver, older adult, nurses, health information technology, cell phone.

Introduction

In Mexico there are 2,941,589 dependent older adults, 41% of whom have a family caregiver (FC),[1] who must invest much of her or his time and energy in meeting the needs and care required by the older adult (OA).[2] However, most of the time these functions are performed without prior knowledge, guidance or support of a health professional, putting at risk the quality of care provided and the safety of the person to be cared for.[1] In addition, this brings about the appearance or loss of control of pre-existing health problems, since the responsibility of caregiving implies constant stress for the caregiver.[3,4]

Currently, Information and Communication Technologies (ICTs) are a convenient resource for health professionals to provide support and advice at a distance.[5] By disseminating reliable, easy-to-read, and easy-to-understand information for the health care of both the FC and the person being cared for, positive changes are generated in the quality of life of the OA.[6] In other words, in the area of health care, ICTs facilitate access to knowledge and also the possibility of enabling new models of care.[5] In Spain, nurses use ICTs to support caregivers, remotely managing healthcare resources such as digital medical records, personalized and interdisciplinary care plans, support groups, medical appointment

reminders, remote monitoring of vital signs, and visualization of wounds.[7] On the other hand, although Mexico has made progress in the incorporation of ICTs in the healthcare system, there are still many pending issues to be solved[8] in terms of the support of FCs, de León Castañeda considers this aspect to be an area of opportunity to provide telenursing.[8]

For these reasons, the aim of this study is to describe the experiences of a FC with the use of ICTs as a means of educational intervention. The results obtained may constitute a reference point for introducing ICTs as a tool for remote implementation of the nursing care plan, thus promoting self-care of the FC and care of the OA that favors her or his well-being.

Materials and methods

A case study of the qualitative approach is presented, with the purpose of carrying out an intensive and holistic analysis9 of the experiences of an FC in the use of ICTs as a support in an educational intervention for her self-care and care of the dependent OA9, both inhabitants of the State of Mexico. This intervention was implemented by an intern for the Bachelor's Degree in Nursing and Midwifery during her social service (*Figure 1*). The following steps were taken to carry out the study:

a) Design of the educational intervention

Theoretical Phase. A literature review was conducted for two months to identify the essential elements to be integrated into the educational intervention.

b) Selection of the participant

Thirteen FCS were recruited from a database, with whom communication was established through messaging and WhatsApp calls, and from which a typical case was selected. The selection criteria included the following charcateristics: being an FC of an OA, having at least one year of experience in such work, being over 18 years-old, having a cell phone or a computer, and agreeing to participate in virtual sessions on a regular basis.

c) Data collection

This last step was carried out in six phases. In the first phase, the objectives of the research project were explained to the participating caregiver, who signed the informed consent form. In the second phase, the OA underwent a comprehensive geriatric assessment, and the health status of the FC was evaluated. Then, the nursing and midwifery intern, together with the FC and the OA, identified and prioritized the needs to address them in the educational intervention. In the third phase, opinions were exchanged to decide on the ICTs to be used and the didactic material, as well as the days and schedule for the implementation of the intervention. In the fourth phase, which was carried out from December 15, 2020 to June 25, 2021, during the covid-19 pandemic, the FC education intervention was implemented. This consisted of 60-minute educational sessions twice a week via WhatsApp video call. Prior to each session, the FC was sent the reading material or video corresponding to the topic to be addressed. The topics were chosen according to the needs identified and covered aspects such as arterial hypertension, anxiety, risk of falls, diabetes, depression, administration of analgesics, hypoglycemic agents, bronchodilators, non-pharmacological pain management, glucose and blood pressure measurement, massages for muscle relaxation and activation of blood circulation, importance of the application of the COVID-19 vaccine, burned caregiver syndrome, healthy aging and self-care. For each topic, infographics were prepared with large letters, without italics or many reliefs, non-phosphorescent colors, and subtitles

highlighted in a different color. In addition, links to two videos selected for their clear and concise content and good-quality images were sent via WhatsApp to the FC. To resolve doubts, the FC could send messages or make phone calls via cell phone once a week or whenever required.

The fourth and fifth phases of data collection were implemented simultaneously. The fourth focused on the implementation of the educational intervention for the FC, while the fifth phase evaluated the didactic materials used in each educational session. After each session, the FC was asked the following open-ended questions: *are videos, infographics, and web pages adequate to learn how to take care of yourself and your family member? what suggestions would you have to improve the quality of the didactic materials in terms of font, design, and format? can you access the didactic materials quickly and easily via WhatsApp?*

In the sixth and last phase, doubts related to the topics covered in the educational sessions were resolved. Once the sessions were finished, two in-depth interviews were conducted with the FC, in which the following open questions were asked: *how has the information provided in the educational sessions benefited her? what was her opinion about the use of phone calls, video calls, messaging and sending didactic material by WhatsApp in the educational sessions? how was her experience during the educational sessions?* Each interview lasted 90 minutes on average and was recorded and transcribed in Word 2013 for later analysis. In addition, 20 voice messages and 311 text messages sent by WhatsApp with information related to the study case, were considered as qualitative material.

Ethical aspects

Ethically, the research complied with the Helsinki Declaration,[10] the Belmont Report[11] and the Regulations of the General Health Law on Health Research.[12] In addition, each interview was kept under a pseudonym to protect the anonymity of the FC and the OA, and each participant signed an informed consent form. This article derives from the research project *"Training Model in Advanced Nursing Practice for Primary Health Care in the care of older adults with chronic disease (Diabetes Mellitus, Arterial Hypertension) with a family approach",* and obtained the favorable verdict of Research Committee (CI/ENEO/114).

Methodological rigor criteria

To ensure the application of the criteria of methodological rigor,[9] credibility and confirmability were met with continuous and persistent observation throughout the educational intervention and the in-depth interview. Also, the information was validated with the participant. For the auditability criterion, the audio recordings, interview transcripts, records as concrete as possible, and direct quotations from documentary sources are available; likewise, for the transfer criterion, the description of the research context and the socio-demographic characteristics of the study participants are presented.

Data analysis

Thematic content analysis was conducted in three stages, according to de Souza Minayo.[13] In the first stage, pre-analysis was carried out, which consisted of the fluctuating reading of the interviews in order to become impregnated with their content, followed by the constitution of the corpus, in which compliance with validity standards such as completeness, representativeness, homogeneity and relevance

in relation to the phenomenon under study was reviewed. This, in turn, led to the formulation and reformulation of hypotheses and objectives. In the second stage, the text was shortened into thematic units related to the study case and a code was placed, which was quantified for a better understanding. Thus, the categories responsible for the specification of the themes emerged. Finally, in the third stage, inferences and interpretations were made and interrelated with the theoretical framework initially designed.

Case Study Background

"Peach" is the pseudonym for the FC and *"Gold"* for the OA (Table 1). Both live in the municipality of Nezahualcóyotl, State of Mexico, in a house that has basic services (water, electricity, drainage) and is shared with people without family ties. During their marriage they conceived three sons who already have their own families and homes (*Figure 2*), all of whom sporadically visit the OA's house and contribute in different ways to his wellbeing.

Results

Two categories emerged from the analysis of the interviews that evidence the FC'S experiences with the use of ICTs: 1) Cell phone and WhatsApp, valuable tools for nursing care with the subcategories: 1.1 Phone call, 1.2 Written messages, 1.3 Voice messages, 1.4 Video call, 1.5 Sending didactic material, and 2) gaining trust from family members.

Category 1. Cell phone and WhatsApp, valuable tools for nursing care.

The cell phone was used as the main device by both the nursing and midwifery intern and the FC for the implementation of the educational intervention. The FC had a cell phone equipped with a camera with 4 Mpx resolution, 2-core processors, 8 GB internal storage and good connection to wireless networks, which allowed the correct functioning of applications such as Google, Facebook, WhatsApp, Messenger, Chrome, YouTube.

1.1 Telephone call

The FC used the cell phone without difficulty to make calls to the nursing and midwifery intern once she registered her in her contacts. The intern made phone calls on average twice a week, lasting 10 to 30 minutes, and only on two occasions did the FC make phone calls to the intern. On the first call, a few days after starting the educational intervention, the FC reported that the OA *"Gold"* was pale, droopy and cold to the touch. After conducting an interrogation, physical examination and vital signs check through the FC via videoconference, the intern indicated that they should go for a medical checkup, and as a result the OA remained hospitalized. The second call was to receive guidance on analgesics, since *"Peach"* suffers from low back pain and headaches.

1.2. WhatsApp

Through the WhatsApp application, written and voice messages were exchanged, video calls were made for discussing diffent topics and explaining procedures, in addition to the sending of didactic material such as videos, infographics, web page addresses and reading materials.

1.2.1. Written messages

Text messages were used for specific situations such as: meeting days and times, confirming,

cancelling or rescheduling appointments, inquiring about the health status of the OA, the FC and important events. Short written messages were exchanged at least twice a week, on average for 15 minutes and no more than 30 words in length. The FC found it difficult to write by cell phone and expressed "*not feeling at ease*" due to the lack of perception of emotions and tedious communication:

> *I don't like messages; I like video calls more (Peach).*

1.2.2. Voice messages

The FC's lack of knowledge of how to send voice notes was identified as one of the causes of poor communication with her children, since due to the covid-19 pandemic they could not be in person at home where the FC performed her OA caring duties. The intern produced a video to explain and exemplify how to use voice memos. In this way, the FC learned to use them:

> *I find voice notes much more practical, because my fingers get tired when I type messages{…} my children are happy when I send them voice notes {…} they say that now we can talk more often and they understand me better. (Peach)*

The use of voice notes resulted in more fluid communication with both her children and the intern. The voice notes lasted from 1 to 5 minutes and were used to clarify doubts regarding infographics, nutrition, medications (analgesics), covid-19 preventive measures and anxiety management.

1.2.3 Video Calling

The FC did not know how to make video calls either, so she learnt how to videocall watching an educational video. The FC's enthusiasm for acquiring new knowledge was important for her to learn how to make video calls. She even took the initiative for video calling when her son was not available to help her:

> *You tell me when we reconnect to review a new topic {…} At such time he (her son) is no longer here, but I'll try to do it alone. What do you think (Peach).*

Almost immediately after watching the educational video, she was able to make video calls . This increased her self-confidence to use technology. The video call protocol included: 1) welcome and thanks for the meeting, 2) report on the FC's health status and the relevant event(s), 3) reminder of the previous topic, 4) evaluation of the material sent, 5) discussion of previously agreed topic with the didactic material sent, and 6) clarification of doubts. There were 16 video calls during the educational intervention, generally from 9:00 - 11:00 am, before starting the FC started her household duties, and sporadically from 18:00 - 20:30, when she had already finished her daily household activities and before dinner time. These sessions lasted from 1 to 2 hours. The FC preferred video calling because she felt closer contact when she saw and heard the nurse talking to her:

> *Yes, I prefer videocalls because in that way we can look at each other's eyes {…} that's the way I like it better, rather than when people just talk to me and I hear their voice {…} When you look at the other person on*

screen, it´s better because there is eye contact. With a phone call you can say things, but not directly. When we see each other's faces {...}the contact is closer (Peach).

Both the FC and the OA expressed their pleasure in receiving clear explanations from the intern during the educational sessions:

I like your topics of conversation very much because you explain everything very well {...} we miss you when we don't have a meeting (Gold).

I feel that with video calls we can clarify many doubts, when we have time for them. (Peach).

In the first two sessions, the FC complained several times of severe headaches, and after questioning her, anxiety and stress symptoms were identified. These issues were addressed, and she was provided with relaxation and occupational therapies, thus reducing the headache and, with it, the stress:

Personally, my headaches and general wellbeing have improved{...} I can tell you that out of 100%, 90% of my stress is under control now.

I feel more secure since you have been supporting me, I feel good, I am calm, my headaches have reduced a lot for the past three days {...} I feel very relaxed, very calm and I´m sleeping very well {...} you have calmed my anxiety a lot {...} I feel good, very sheltered, that you cared for me, because you are there at all times {...} I feel very calm, with the video calls. (Peach)

The accompaniment of the intern also counteracted the isolation due to the restrictions imposed on this age group by the covid-19 pandemic:

Being in touch with you has helped me a lot, because honestly I have no one to talk to (Peach).

During the video calls, the FC also mentioned how she learnt to take care of her own health by improving her eating habits:

I am learning to eat everything, but in small portions, something I didn't do before [...] you give me very good tip-offs for my health. (Peach)

As one of her main needs, she expressed interest in learning how to measure blood pressure, as her greatest difficulty was the placement of the blood-pressure manometer cuff:

What I would like the most is to learn how to measure the blood-preassure correctly, that would be very helpful and useful {...} you know that I haven't found yet the exact point to place the manometer (Peach).

Using video calls, the intern was able to explain several times the procedure to the FC, who repeated continuously both verbally and practically, until she was able to use it correctly without any problem:

Ok, let's start again, first I touch my arm and where I feel the pulse I place the cuff {...} then, I put stethoscope with the olives facing out and then I start {...} I close the valve here and pump it up to 160-180 {...} and then I

start releasing the air until I start to hear the noise like a heartbeat and then when it stops, that's the pressure beat. (Peach)

Another use of the video calls was to provide advice and manage the paperwork for the application of the COVID-19 vaccine, which brought peace of mind to the FC when she registered her husband and herself:

I fell more relaxed now because we are already registered, we just have to wait for our turn (Peach).

1.2.4 Sending of didactic material

The didactic material included media and resources, such as infographics and videos, which facilitated the teaching-learning process of the FC. The infographics were sent by WhatsApp in image format and the FC got them without problem because in such format she could use them easily and at any time. The FC showed her confidence and gladness when the topic was addressed, the infographic was a valuable resource to remember its content:

I am very happy with the material (the infographics) because when I feel that I have forgotten something, I look at it again or if not, I call you {...} the infographics have always been very clear (Peach).

The YouTube videos were selected according to the topics and with a maximum duration of 6 minutes, since the FC expressed tiredness:

I don't like to spend too much time on the cell phone because then I feel as if my eyes start burning (Peach).

Two videos were sent. The first, lasted 2:57 minutes and shows the correct placement of the inhaler in order to avoid medication leakage, and the second video, with a duration of 5:06 minutes displays the beginning of the application of the covid-19 vaccine to older adults. Regarding the video on the effective placement of the inhaler, the ease of repeating it as many times as necessary and pausing as required was useful and indicated both by both the FC and the OA.

Three videos with a maximum duration of 2 minutes were sent via WhatsApp. The first video indicated how to make a video call via WhatsApp; the second one showed how to send voice notes, and the third video how to send or forward photos and videos in the same application. The FC confirmed having learned how to use the indicated ICTs:

Hello, good afternoon {...} here I am trying out what you sent me today (video), I got it {...} I´ve told my son that you explain everything very well and I understand everything you tell me very clearly {...} now I just need to practice more. (Peach)

Category 2. Gaining the trust of family members.

A 40-minute virtual meeting was held with the FC'S third son, who was at the senior citizens' home. At the end of the meeting, the son made positive comments about the educational sessions and the information provided:

My son has told me that "she (the nurse and obstetrics intern) explains everything very clearly, mom, we have no doubts after her explanation" (Peach).

Based on these comments, the FC was more confident and willing to participate in the educational intervention, as well as to make changes in her daily routine to improve both her self-care and the care of the OA.

Discusión

The FC participant did not have a computer, as is the case with most of the OAs and their caregivers according to INEGI.[14] She only had a cell phone with which she only made phone calls. It was necessary to train the FC so that the different WhatsApp functions (video calls, voice messages, and sending didactic material) could serve as a means of communication in the educational sessions. This outcome agrees with various investigations in which it was reported that the FC had insufficient knowledge[15] and skills to use ICTs, such as cell phone devices, computers, or laptops, an issue which became most evident during the pandemic.[16,17]

Especially the video call was the most appreciated ICT too. It allowed training the FC in procedures to be performed for the care of the OA, as referred to in other research.[18] Through the video call, a feeling of closeness of the FC with the nursing staff was achieved, as well as accompaniment for her self-care and follow-up care for the OA. O'Leary agrees with this aspect, highlighting the video call as the main means for the implementation of an educational intervention.[19]

On the other hand, written messages via WhatsApp were not easily sent by the FC's, while voice messages were a more accepted and used resource. In this sense, the publication by Sánchez Juárez coincides with the results found, since it refers that OAs did not like sending text messages either.[20]

The results obtained in the present research coincide with O'Leary *et al*.[19] and Barbara *et al*.,[21] who consider telephone calls, video calls, and voice messages as the ICTs most accepted by FCs in the implementation of educational interventions. However, it is also true that the use of ICTs is a challenge for the elderly population,[15,17] although in some cases they are open to acquiring this type of knowledge and skills, as the present study or Pino Juste *et al* show,[22] where a positive attitude towards their use was found.

The interactive sessions and the characteristics of the material used played an important role in the motivation of the FC to participate and achieve the goals of the study. This is also pointed out in the work of Barbara *et al*.:[21] the motivation was achieved using adequate and attractive didactic material with interactive advisories is important. In addition, this coincides with Barrera-Ortiz *et al*.,[23] who state that the development of the materials should be based on the characteristics of the participants, such as their educational level, in order to adapt the language to be used in the materials and tutorials.[23] Likewise, the use of YouTube videos via WhatsApp was well accepted; this coincides with the statistics of the consumer study in Mexico conducted by Yim Min Shum.[24] YouTube is among the top three platforms with the highest usage in all age ranges, with 8.3% of OA participation.

An important element of the FC's participation in the educational intervention was the trust generated in one of her children, an aspect that coincides with Guzmán's research,[25] since she affirms that, as a means to speed up the learning process, the family is the main support nucleus to validate or not the information and teaching provided by someone external. Finally, the FC and the OA stated that they felt accompanied by the Nursing and Midwifery intern during the entire distance learning intervention, as well

as satisfied with acquiring new knowledge that helped to improve their health, similar to the findings in various studies.[17,26]

Conclusions

Evidence was found that the cell phone is the device that FCs have and use the most and that ICTs, in particular video calling, voice messages, and videos sent through WhatsApp, were useful and accepted tools by the FC for communication and learning. Interactivity and adequate didactic material were also key factors for the motivation and participation of the FC in the educational intervention. In addition, the trust generated by the participant's son was an important factor in achieving adherence to the intervention. Overall, the results suggest that the implementation of distance educational interventions can be an effective strategy to improve the health of OAs and their caregivers, as long as the limitations and needs of this population are adequately considered.

Limitations of the study

The lack of diversity of the sample was the main limitation, as it only included one FC and one OA and, consequently, the same geographic region. This could also have caused a response bias, as the FC participant was perhaps more motivated and willing to participate in the educational intervention at a distance than other hypothetical caregivers.

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Figures and Tables

Figures

Figure 1. Educational intervention

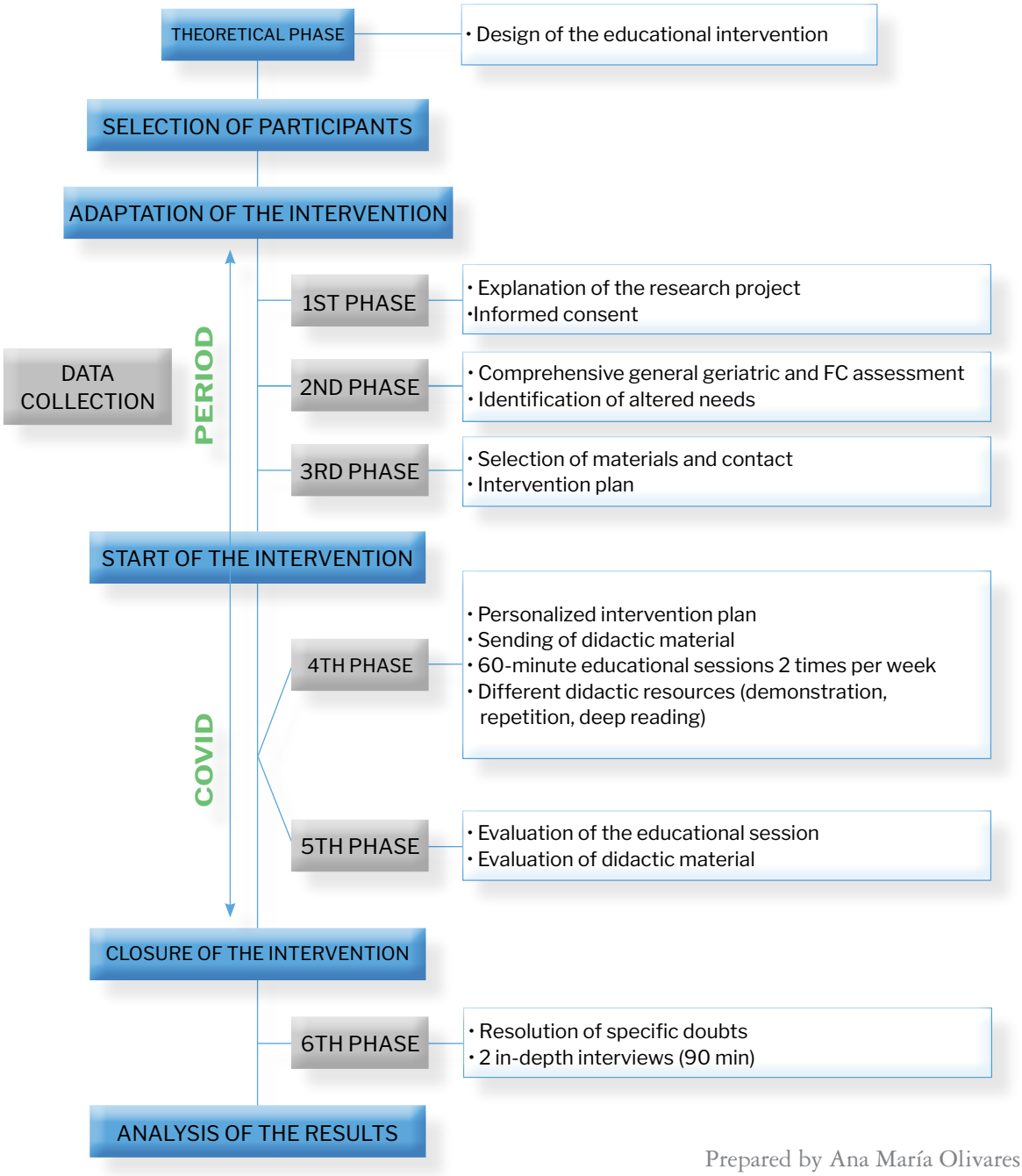

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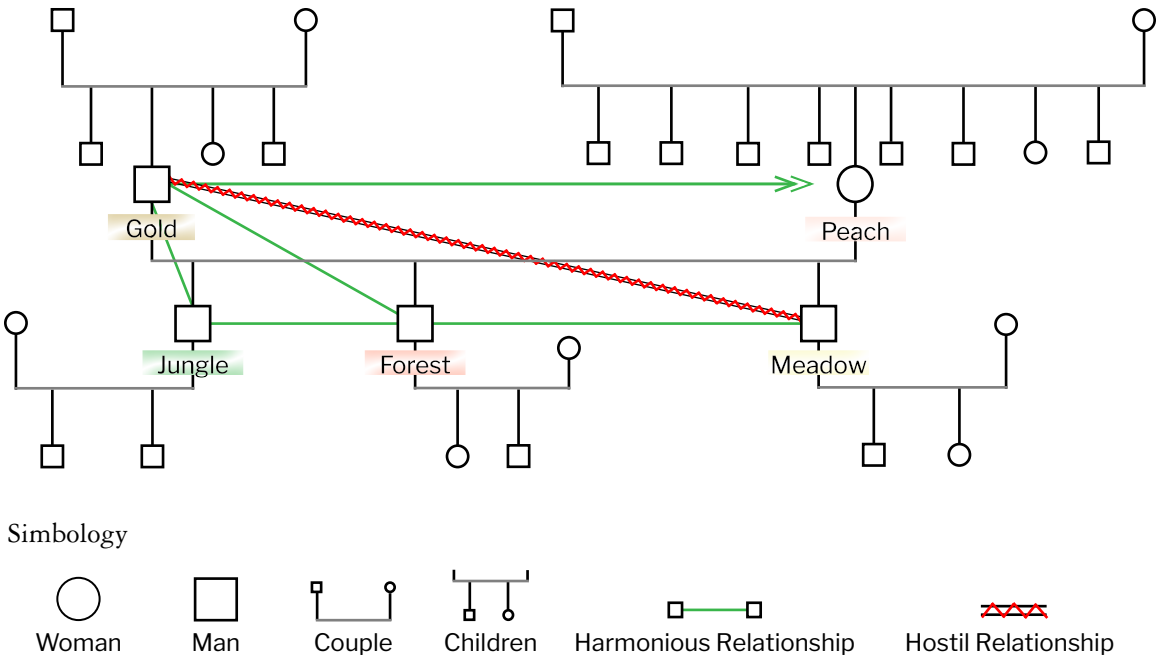
Figure 2. Peach and Gold Genogram



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Tables

Table 1. Profile of participants

	FC "Peach".	*OAM "Gold"*
Age	58	60
Sex	Female	Male
Relationship	Wife	Husband
Level of education	Primary	Primary
Occupation	Housewife	Retired
Chronic diseases	DM II, depression, scoliosis (severe low back pain), Anxiety, Migraine	COPD

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