

Lesbos Case Study

REPORT ON THE DEVELOPMENT OF WASH GAMES IN A
REFUGEE SETTING

Ilike van der Linden & Myrthe Dol
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Introduction

Simple measures can help prevent diseases. This is especially relevant in refugee camps where water, sanitation and hygiene (WASH) facilities are shared, and hygiene standards tend not to be met. Inadequate WASH facilities can lead to many problems, which can be caused by, for example, unsafe drinking water or unsafe disposal of human waste. A result can be diarrhoea, which kills over a million people a year (Ginja et al., 2021). A simple measure, like proper handwashing practices, can reduce the risk of getting infected significantly with roughly 48% (Cairncross et al., 2010). However, continuing with simple measures is a challenge on the long term. Serious games can be used to encourage desired behaviour. In the context of WASH, these desired behaviours are multiple practices such as washing hands with soap, coughing and sneezing in the elbow, washing vegetables, etc. The goal of playing games for development in the WASH sector is to reinforce safe practices in the long term by frequently talking about and demonstrating the desired behaviours. Designing a game is a process which requires time, observation, design, and testing, among several other things, to come to an end product; a game that enhances awareness and behaviour change. As Kragić Kok et al. (2020) described in their article, the target group is an important factor in making the game and its design work; their evaluation determines the end version of the game. They made use of a process which started off with an understanding of the situation, then the design of a game. This continued with a prototype being tested and evaluated, leading to redesigning the game based on the experiences of the target group. This is of great importance, in order for the game to be played, it needs to be enjoyable and fun. If it is not, no knowledge will be transferred. An ideal situation would occur when the game would repeatedly be played, as the learning cycle works best when the education is repeated (Bochennek et al., 2007). The use of games improves the cognitive skills of the children and their knowledge and skills (Kragić Kok et al., 2020). In this report the testing of four different games is described and analysed based on a mixed-methods evaluation and recommendations on adaptations to the games and their roll out are provided. The games were tested in the Mavrovouni refugee camp on the Greek Island of Lesbos. The four games were tested to see whether they were suitable to the situation inside the camp. It is of great importance that a good foundation of the knowledge of key WASH behaviours is present for their safe practice. Games can help with this, but first there needs to be a good fit with the local needs and interests of people living in the camps.

Background

Refugee situation

Since the refugee crisis started in 2015, Lesvos has been known as one of the Greek hotspots. The camp on Lesvos, Camp Moria, was destroyed in a fire on September 8, 2020, leaving around 13,000 refugees on the streets. After eight days, the new temporary Mavrovouni refugee camp, or Moria 2.0, was set up by the Greek government in cooperation with NGOs and the UNHCR.

The population in Mavrovouni consists mostly of Afghan people followed by Somalis and Congolese. There are also other nationalities such as Syrians, Eritreans, and Iraqis, among others. This results in a diverse international setting. Inside the camp there are many organisations active, for the most part NGOs and UN agencies like EuroRelief, Watershed, UNICEF and UNHCR. The NGOs execute the work of, among others, accommodation, logistics, operation and maintenance of water, sanitation and hygiene (WASH) facilities, education, medical and psychological support.

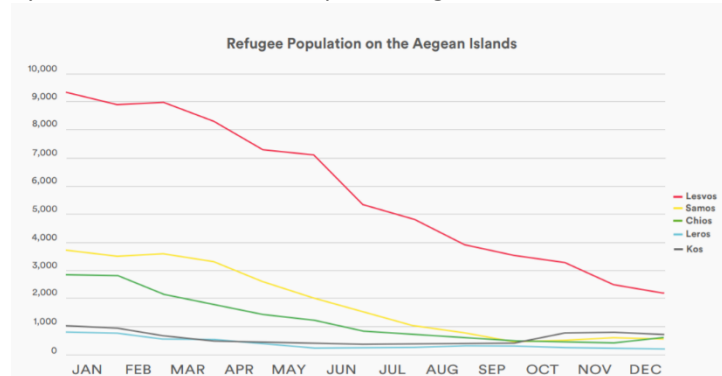


Figure 1 Decreasing refugee population on the Greek Aegean Islands (Watershed, 2021)

The security is in the hands of the Greek police and private security companies. There are also opportunities for the residents of the camp to become community volunteers, for example, by becoming a translator for an NGO or helping with the maintenance work. By doing so, they help the community inside the camp and sometimes they get goods like extra food in return.

Inside the camp, there are also options for adults to take sport classes, where there is a focus on the inclusion of women. For the children, they have the opportunity to attend school and there is also a playground and sports fields for them to play and do sports. In addition, there are extracurricular classes where they can, among other things, learn how to play an instrument or use a computer.

Since the start of the new camp, the population of refugees on the Greek islands has been decreasing with many moving to the mainland and beyond (figure 1). Over the last year the population of camp Mavrovouni has decreased from over 7,000 people in March 2021 to less than 2,000 people in February 2022 (Watershed, 2021). This decrease can be explained by multiple factors. First of all, on June 7th 2021, the Greek government designated Turkey as a safe third country which enabled ejections of refugees back to Turkey, if they would have arrived in Greece through this country (GCR & OXFAM, 2021a). Furthermore, according to OXFAM and the Greek Council for Refugees (2021b) in the first four months of 2021 around 2,100 testimonies about pushbacks were registered. However, clear facts about this are not presented. A third factor could be the presence of COVID-19. Since the start of the pandemic, a serious drop in refugees has been noticeable, despite the relatively low number of positive cases inside the camp. There have been fewer migrations due to the pandemic and the restrictions that came with that (European Commission, 2021). In addition, other routes appear to be more common now than before, leading refugees to other locations than Greece. This can, for example, be the route through Belarus and Poland (InfoMigrants, 2021). Finally, a lot of people received a Greek ID in the past months, also leading to a significant decrease in the population inside the camp.

WASH situation

Safe WASH conditions are key for populations' health and well-being. However, places like the refugee camp Mavrovouni are extra vulnerable as many people live in a relatively confined space and access to WASH facilities is limited. For a long time, the camp residents only had access to shared chemical toilets which were placed at different locations in the camp (figure 3). They also had access to a small number of shared hot water showers, which resulted in the creation of their own shower cabins next to their tents. In December 2021, the long-awaited opening of shared shower and toilet containers took place. In the current situation, camp residents have access to 655 flush toilets and 370 hot water showers, both connected to the municipal sewerage system (Movement on the Ground, 2021). Next to this, every toilet cabin has a sink with soap, a mirror, and a bin for the disposal of sanitary pads. All these containers are accessible during the day. At night only a few are opened due to safety issues. One problem occurring with the showers is that due to technical problems with the generators not all showers have hot water during the day. The new sanitation facilities have been placed on different locations across the Mavrovouni camp. As can be seen in figure 3, at least two of them have been installed in every zone. They are constructed on both ends of the zone area, ensuring everyone has access to the facilities. Close to every toilet there is a WASHpad that functions as a place to collect water, wash dishes and wash clothes. Every WASHpad has about 8 taps and the water is drained to the middle. WASHpads are connected to the sewage system. On the end of every zone, handwashing stations (as can be seen in figure 2) can also be found. These are run by trained resident volunteers, who provide users with water, soap, and a paper towel to dry their hands afterwards. The handwashing stations consist of a small open structure with a roof, inside there are two big plastic barrels and plastic water bottles with soap. These barrels are not connected to a drainage system, but are filled up with water from close-by water sources and brought in by a van. Another project was the distribution of small wooden structures with a sink and a jerrycan placed on top to all the residents inside the camp. The jerrycan has a small tap to pour water which can be used to wash hands, dishes, and other utensils.



Figure 2 A handwashing station (Asterias-Starfish, 2022)

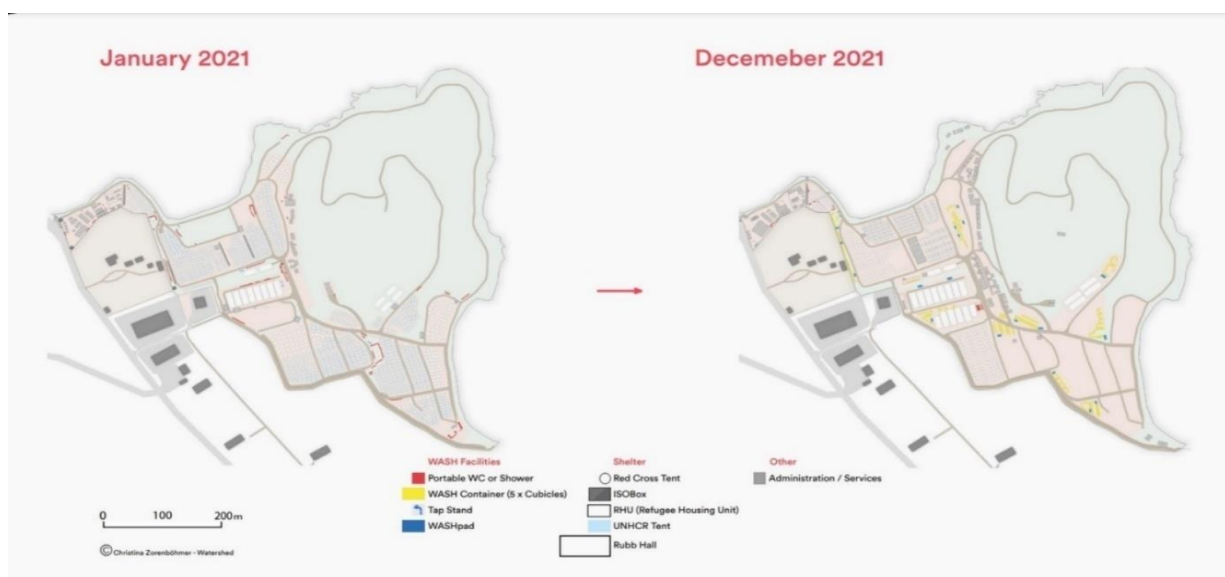


Figure 3 Locations of chemical toilets in January 2021 and the current locations of the newly opened WaSH containers (Watershed, 2021).

Learning and gameplay situation

In camp Mavrovouni all children have access to education and different educational programs are on offer, organised by, among others, UNICEF and the NGOs Metadrasi and EuroRelief inside and outside of the camp. The organisation One Happy Family also offers language, music, sport and computer classes. Among these programs is the educational program of EuroRelief.

The EuroRelief school is a psychosocial support programme and has several classes for children between the age of 6 and 12. This age group is divided in two, with the older age group 9 to 12 and the younger age group 6 to 8. Each class has 2 hours of education from EuroRelief every day. The same classes also have an additional 2 hours of education with Metadrasi before coming to the EuroRelief class, where they mainly learn Greek and math. During the classes, in which mostly English is taught together with some math or art, games are used in the school curricula. Teachers make use of flashcards – and make competitions out of this with the students – memory and scrabble. Besides organising classes, EuroRelief volunteers also go on educational outreach activities. During this outreach the children get some practices to repeat the teaching material. This is often combined with playing fun games, which can also help improve the English of the children. These games mostly involved Uno or memory games. During the gameplay, parents and siblings often join children. This is encouraged by the teachers, to include everyone in the education that is being provided and support strengthening the family bond. Both the classes and the outreach have been opportunities to play games.

There are also other areas where children play. Mostly, this occurs outside. Children enjoy riding their bikes, playing with balls (mostly playing soccer) and playing with marbles and kites. There is one small playground in the middle of one of the camp zones; however, it seems it is not used often. In addition, there is also a big playground on top of the hill inside the camp. This consists of a soccer and basketball fields. Children love going there, which is also carried out during school time, but as it is located in a quite remote area at the end of the camp, it is difficult for children to reach, especially for young children. Besides the play fields, some children also have cards and board games at home, or even play games on their or their families' smartphones. The population in refugee camp Mavrovouni has a wide range of cultures. This also reflects to a certain extent in the EuroRelief classes. Besides having Afghan children in class, there are also children with other nationalities and therefore children with different languages attending the same classes. This international setting can create challenges around culture and language. One of them is that the games are being played in English as this is not the mother tongue for the children. Another is that they might have to learn or do things in different ways than they are used to. Another point that needs to be touched upon is the psychosocial situation. A lot of camp residents have come across traumatic events in their lives. Among them are also children. This can lead to e.g., unusual behaviour and concentration issues. This is necessary to keep in mind when playing games or teaching in refugee camps, either during classes or during home visits. As a result of these issues, lessons can be disturbed quite frequently, complicating the learning. Especially for the games discussed in this report, an important factor is religion as it focusses on hygiene practices. According to Allegranzi et al. (2008), the Islam underlines cleanliness as the Qu'ran gives clear instructions on how this should be done. This is the reason why children in camp already know a lot about hygiene and why washing hands for them is already a normal practice. An example of this good hygiene knowledge is a dad that chased his two young daughters to get them to WaSH their hands. The girls were a bit stubborn and tried to escape from their dad. However, the dad told them to wash their hands and the girls eventually did accordingly.

Games and Rules

In total, four different games were tested. In this section a short description of the rules and the gameplay itself will be provided for each of them.

WASH Quartet

The WASH Quartet is a card game which is played by 3-4 players with the age of seven and older and is derived from the original Quartets game. A quartet is a set of four cards from the same category. This particular WASH Quartet contains 7 categories around WASH. The goal is to collect as many of these quartets as possible. The person with the most quartets is the winner. But how to collect those cards? The game is played according to the following rules:

1. The cards (28 in total) are shuffled, and four cards are given to each player. The cards that remain are put in the centre of the table. The dealt cards are held face up in a player's hand so that only the person who holds the cards can see them.
2. The youngest player (player 1) can start with the game, by asking another player (player 2) if they had a certain card (e.g., card category *Safe Food* – practice 'Wash vegetables') which would help player 1 create a quartet. If player 2 does have the card, then they hand it over and player 1 gets another turn. If player 2 doesn't, then it becomes her or his turn to ask and player 1 draws one card from the centre of the table.
3. When a quartet is created, or a complete quartet was dealt, then the cards creating the quartet are placed in front of the player and the player says: quartet!
4. The game ends when all the quartets have been created.

WASH Code Cards

The WASH Code Cards game is a newly developed card game and is based on two different games, one called Code Names and the other is the Quartet game described in the previous paragraph. The game can be played by 3-4 players with the age of seven and older. Instead of making a quartet, in the Code Cards game you should make series of three cards from the same category. The goal again is to collect as many sets as possible. The winner is the person with the most sets. However, there is more to it. In the following sentences the rules are explained.

1. Take the cards and put nine of them on the table with the images face up in three lines of 3 cards. Put the next nine on top of the first cards and so on until you have nine piles with cards.
2. Players have to make horizontal or vertical rows of cards that all have the same category, but all have different symbols. If you manage to do so you can remove these three cards from the game and keep the set.
3. During your turn, you pick up one card and move it to another place in the square. You have three options.
4. Put it face up and try to make a series.
5. Put it face down and remember the symbol on the card and wait for a chance.
6. Turn a card around that is face down and try to make a series.
7. The game is over when there are no more series to make. Each set that is formed makes the player score 1 point. If you have two series of the same category you get double points for that series.

Fly over

The Fly Over game aims to convey that following the right actions will lead to safe drinking water, proper sanitation and good hygiene, while taking the wrong actions may lead to the opposite (symbolised by the fly). All the children have to cooperate, they all win when the pawn reaches the end first, they all lose if the fly reaches the end first. Along the path are four different mazes with the

same icons. At the end of the maze you can see the end result that the children have to reach by choosing the matching icon. The topics that the children go through are: safe drinking water, safe food, safe sanitation and clean hands. In order to move forward along the path, the children have to roll a dice. On this dice are two flies and four persons. Connected to the playing of the game can be the education about flies and hygiene on house hold level.

The game is designed to play it with a maximum of four players at the age of 7 or older. The rules are as followed:

1. The game starts when the first child roles the dice. If the dice lands on the person, the pawn can proceed one step forward (white line). If the dice lands on the fly, the fly proceeds one step forward (orange line).
2. Once the pawn has reached on the "make a choice" step, the first next player who rolls a person with the dice, should choose one path out of four possible paths to reach the target step and then draws the pawn through the path. If the player makes the right choice, the maze will lead the pawn to the "required" target. The pawn stops there and the game continues by rolling the dices again. If the player closes the wrong path, the player needs to return the pawn to the 'make a choice' step. The next player that rolls the person with the dice again, can try another attempt in finding the right icon and this step repeats itself.
3. The game ends if either the person or the fly reaches the end first. If it is the person, all the children win. If it is the fly, all the children lose.

WASH Mazes

This game is an educational game, which covers three different topics; safe food, safe drinking water and disease prevention. Each maze consists of 10 different cards with icons related to WaSH practices. The goal of this game is to choose the four right practices. These four practices are necessary to reach the end goal, which, for example, can be safe food. The rules are as followed:

1. Cut out all of the cards.
2. Select the four right cards indicating the right practices.
3. Put them on the therefore designated blocks (A-B-C-D).
4. Check your answer with the answer on the back of the sheet.

Methodology

For this research, mixed methods were applied to collect data from children playing the games and also to analyse it. The target population were school children where the ages differ for every game. For the WASH Code Cards and the WaSH Quartet games, the age range was 7 up to 13. For the Fly Over and WASH Mazes it ranged from 5 up to 14. Children were reached through the classes of the EuroRelief education programme and through outreach activities such as visiting their homes. Besides this, a 'game morning' was organised during one weekend to reach more children, also outside of the school.

Data collection

For this research, primary data collection methods were used, obtaining information during a two-month stay inside the Mavrovouni camp. To measure the level of understanding and enjoyability of the games, a quantitative method was used. This was done by using surveys, and preparing a questionnaire per game in advance. These surveys can be found in Appendix I, II and III. Using the mWater app it was possible to gather and save all the data, regardless of the location of the enumerators. To conduct a survey with a child, signed consent from the caregiver or teacher was requested. The consent form can be found in Appendix I. The first questions in the survey were focused on general information about their age, gender and nationality. This was followed by questions about the enjoyability and understanding of the games. The end of the survey consisted of questions about lessons learned and suggested changes for the games. The survey also had a space for the enumerators to add their comments and suggestions.

Naturalistic observations were used as a measure for qualitative research. There were observations done in two different ways. First of all, during the playing in classes and on outreach, observations were written down if things stood out. This was for example done when it seemed as if their answers given to the questionnaire did not seem to be correct compared to the way they behaved. Their reactions to the games, whether they were concentrated, seemed to enjoy it were included in this. In addition, specifics on the duration of the games or problems that arose were also written down. Secondly, observations of the WASH practices inside the camp were made. These observations were focussed on the type of facilities, availability, accessibility, construction, developments and NGOs involved in these processes. Based on these observations well-suited recommendations for the games could be formed.

Data was gathered during the EuroRelief school classes and during home visits. The games were played with small groups of children, and occasionally the teachers or parents joined as well. However, the surveys were only conducted with children. The surveys for the WASH Quartet and Code Cards were conducted one-on-one, while with the Fly Over and WASH Mazes were conducted with small groups of students. This difference occurred as the first two games were mainly played with older children, while the latter two games were played with younger ones. These younger children often showed less concentration levels and often at a first glance did not understand the questions. It provided opportunities for children with a higher level of English to help their fellow students or relatives out by translating the questions to them.

Semi-structured interviews were also conducted. These interviews consisted of asking questions and having discussions with the teachers. They were asked whether they liked the games, found them suitable for the present situation, whether the level of the games' difficulty was proper, if the children understood the games and if they had suggestions for improvements on the design of the games.

These methods were chosen as they give a broad overview for the evaluation of the games. It provides both the opinion of the children and teachers, but by adding the observations the validity of the answers can be questioned. Hereby broader and potentially better suitable recommendations can be proposed.

Data analysis

The mWater app was used to collect and store all the gathered data. The app also allowed the creation of graphs using the data collected on the surveys. These graphs were used to make an indication of the importance of the answers of all the questions and to set the importance for more in depth analysis. These more specific data analysis and graphs were made using Excel. The in-depth data analysis were coupled with the written observations made during the game testing, leading to a rich evaluation of the games in question.

Validity

Some factors made the testing and data collection more difficult.

First of all, the language barrier made it difficult to test the games with some of the children. The games were not translated to the mother tongues of the children, but all played in English. On the one hand, they did not always understand the rules of the games and gameplay by explaining it to them in words, or they did not know the English concepts the games were about. In addition, the language barrier may have influenced how children answered the questionnaires. The purpose of the questions sometimes was difficult to understand, leading to inaccurate answers. For example, when asking children what they liked about the game, some of them answered with other games they liked such as the physical game called hide-and-seek. On the other hand, the language barrier may have also made the interpretation of the answers of children on the questions from the survey more difficult. As a result of the English proficiency of the children, it was sometimes difficult for them to express themselves or it was difficult for the surveyor to understand what the children were trying to say about the games. The level of English proficiency was often related to the age of the children. Children with the lower levels of English used to be the youngest ones.

Secondly, the culture may have had an influence on how children answered the questions. Most of the children were from Afghanistan and were raised within an Islamic culture. In these cultures it is common to answer with the expected answer, in an attempt not to offend others. Although there was not a desired answer when conducting the survey, the children may have felt it that way. This may have been especially the case when they were asked about whether they liked the games or not. To prevent this from happening, multiple measures were used, like using a traffic light assessment or thumbs up-side-down to indicate the enjoyability of the games. In addition to this, a question on whether they wanted to play the game again was added. It was indicated by one of the teachers that this was quite helpful as oftentimes the children would rather say they did like it even if they did not, but when asked if they wanted to play it again their answer was honest.

The games neither had between them the same number of surveys conducted nor the same number of surveys conducted by gender. Furthermore, the expected number of surveys was not reached (40 surveys per game) due to multiple factors. First of all, the period of time to play these games was two months. In the beginning, it took time for the enumerators/researchers to adjust and get to know the functioning of the camp, which reduced the amount of time available for the testing. In addition, the school had a small number of children, around 50, with a low attendance level to classes. This was mainly because the children had overlapping schedules with other programs, but the classes were also weather dependent. Another reason was that during outreach activities children very often were not found at home. Also, if the weather was nice, the children were playing outside, and their parents did

not know where exactly. Furthermore, if children were approached on the streets when playing outdoors, they very often were not willing to play games with someone they considered a stranger.

Another key factor is associated with trauma. The effects of trauma could be noticed with some of the children with whom the games were played. Trauma very often led to children's lack of concentration or fights erupting in the classrooms. In some other occasions, trauma also meant that children seek for a lot of attention or did things they were not supposed to do during the classes. Trauma in children can be influenced by a parent being traumatized and therefore not taking enough care of their children or even neglecting the care of their children. These kinds of behaviour also delayed the testing process.

Almost all of the games were only played one or two times per child while testing. As a result of this, it was not possible to measure behavioural changes as a result of the games and check whether they put the gained knowledge into practice.

During the game testing period, for the Fly Over and WASH Mazes, some of the questions got adapted. This was the question about the enjoyability of the game. Based on the answers given to the question what they did like and did not like about the game, an answer for the enjoyability could be formed. These were, however, not answers they had given themselves. It is therefore an assumption and can only be used as an indication.

Finally, on some occasions, confusion arose about some questions. For example, for the WASH Quartet, several interpretations can be made of the answer 'don't know' given by some of the children. For the last 2 questions in the WASH Code Cards game the same explanation can be given. It could, for example, be that the children did not learn anything new and/or the vocabulary and questions used were not understood by the participants.

Key findings

WASH Quartet

The WASH Quartet survey was conducted with 15 school children (8 girls and 7 boys) between the age of 7 and 13 after playing the game for 1 up to 3 times. In total five different questions (Appendix II) were answered by all the respondents.

Overall, the game was enjoyed by the players (figure 4). The children that reported not finding the game fun but wanted to play it again were found to be older children, in the middle of the surveyed age range (10 and 11 years old respectively).

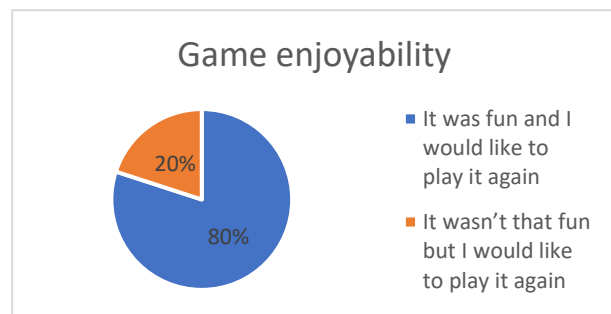


Figure 4 The Game Enjoyability

When asked about the understanding of the rules and the meaning of the cards, similar results came forth. About half of the participants understood it entirely and the other half had a partial understanding (figure 5). Some children did not understand that they had to collect four different cards of the same category, and for some others it was hard to understand which card to ask their opponent

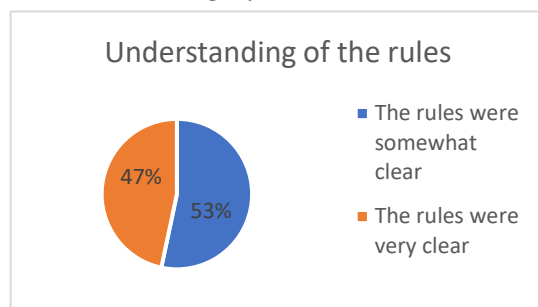


Figure 5 Understanding of the rules in percentages

and often they asked for a card they already had. What is interesting is that boys seemed to understand the rules and the meaning of the cards faster and at an earlier age than girls (figure 6). Reasons for this could be that boys are more used to go to school and learn than girls are. Another possible clarification is that boys learn faster than girls at this age. In general, older children have a better understanding of the game (rules and cards) than younger ones. Based on this finding, it can be drawn that the minimum age for a child to play this game is 8 years old.

The level of English varied between the children, being low in general. Therefore, many of the words in the cards were hard to pronounce and were new to them. Understanding the meaning of the cards required a lot of concentration which was challenging for the children with the lowest English proficiency to sustain. For the children with a higher level of English this was in general less challenging but sometimes they still had a hard time pronouncing. This observation was also made by the teachers interviewed.

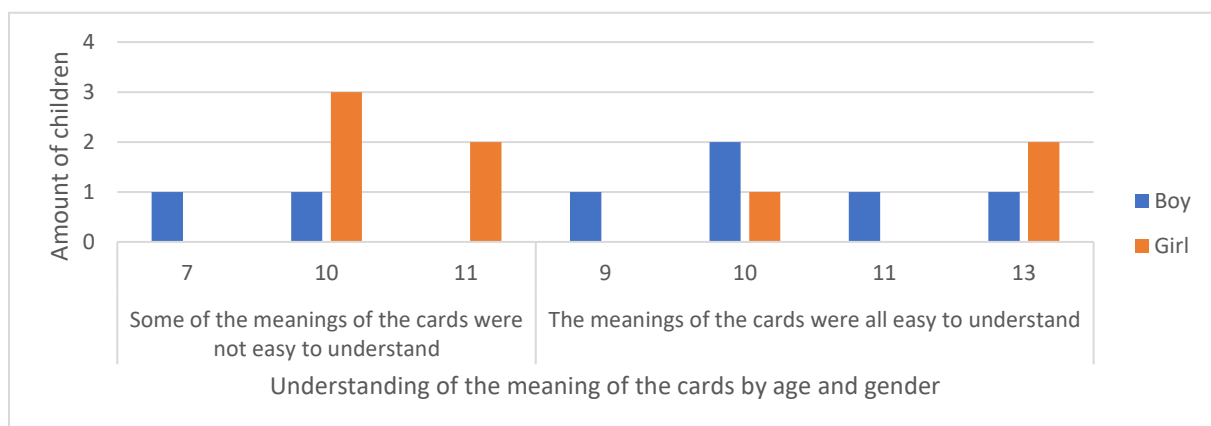


Figure 6 Understanding of the meanings of the cards by age and gender

Furthermore, based on observations during gameplay, children frequently described the icons when asking a card instead of reading the words on it. Their low level of English might explain this. Their low level of English also partly explains why kids said that some of the meanings of the cards were not easy to understand. As the games are meant to reinforce WASH behaviours besides being fun, a question about the lessons learned was asked. Figure 7 shows that 40% of the children indicated they had learned something new. The following issues were indicated to be new for them:

- Washing hands at critical times (4 participants)
- English words (4 participants)
- Use the toilet (1 participant)
- Keep the toilet clean (1 participant)
- Use clean cups (1 participant)



Figure 7 Lessons learned by the participants in percentages

Interestingly, new English words were mentioned multiple times. Although this was not the purpose of the game, it is something that needs to be considered. Multiple words were not known and thus they were learned during the gameplay. This was seen during the testing. Multiple questions about the words – meaning as well as pronunciation – were asked. This might have to do with the fact that most of the surveys were conducted during English classes. As learning new English words is one of the purposes of the English classes, this might be the reason for kids giving English words as an answer.

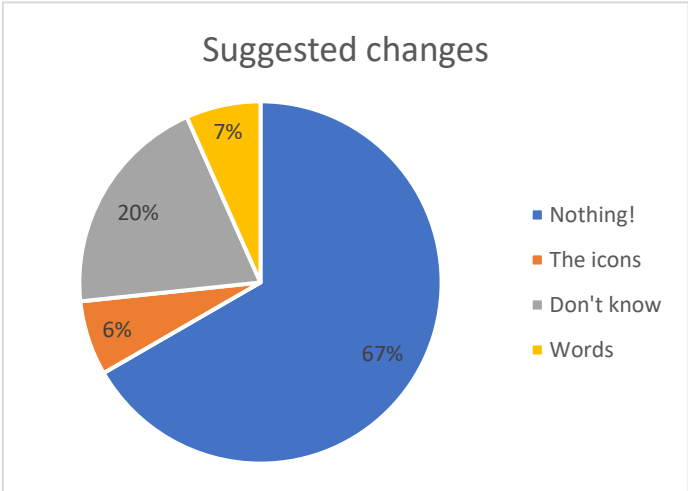


Figure 8 Changes suggested by the participants in percentages

The fifth question focused on the changes or adaptations that the children wanted to see reflected in the game. Figure 8 shows that children were quite satisfied with the game. Apart from some difficult English words (Appendix V) and the poo-icon in the practice 'No poo on streets', which the respondent might find dirty, the game didn't need major changes according to the children. Interestingly, some children still liked the icon.

However, during the gameplay there were questions about several other icons. One of them is the water pond that appears in

the 'Protect water source' practice under the *Safe Drinking Water* category which was asked multiple times. The kids did not seem to understand what exactly the icon meant. There were also questions about the icon of the 'Safe food' category as children couldn't relate the type of food (pancakes) eaten by the boy to the way he was eating them (with a fork). There also has been confusion about the same icons used for different words, which was the case with category 'Clean hands' and the category 'Clean hands when caregiving'. Although the latter is not included in the games after all it might be good to keep in mind when designing games for caregivers. The children also got confused by the same words and corresponding icons used in a category as well as the specific components on the playing cards. This is for example the case with the categories *Unhappy Flies* and *Safe Sanitation* which both have the 'No poo on streets' practice. Another example is the category *Health* where the practices 'Safe drinking water', 'Safe sanitation', 'Safe food' and 'Disease prevention' are included. However, all these practices

are also on other categories. Lastly, according to the teacher, the fly icon of the *Unhappy Flies* category didn't necessarily look unhappy.

WASH Code Cards

The WASH Code Cards game is a newly developed game tested for the first time in Lesvos. In the first version, the game contained 64 cards. This turned out to be too many cards as the game took a long time to be played making kids lose their concentration during the gameplay. A first adaption was made containing 48 cards with sets of 3 cards instead of 4. Later, one more adaption was made for the game to contain 42 cards. The last adaption implied a key improvement when it comes to time management and keeping children interested.

In total, the WASH Code Cards survey (Appendix II) was responded by 13 children (6 girls and 7 boys) between the age of 8 and 13. The same five questions asked in the WASH Quartet survey were answered by the participants.

The game was found very enjoyable as 92% of the respondents reported that they liked the game and would play it again (figure 9). The age range, however, seems to be an important factor. The youngest participant was least enthusiastic about the game.

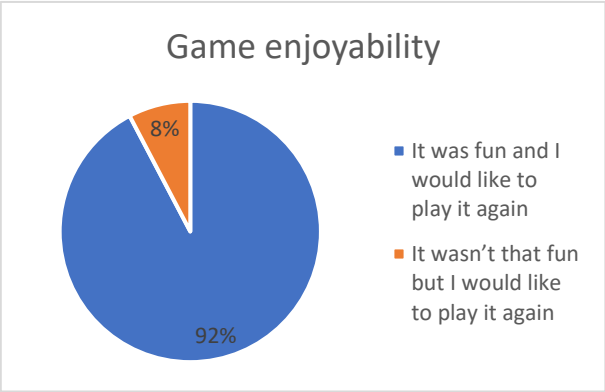


Figure 9 The enjoyability of the game in percentages

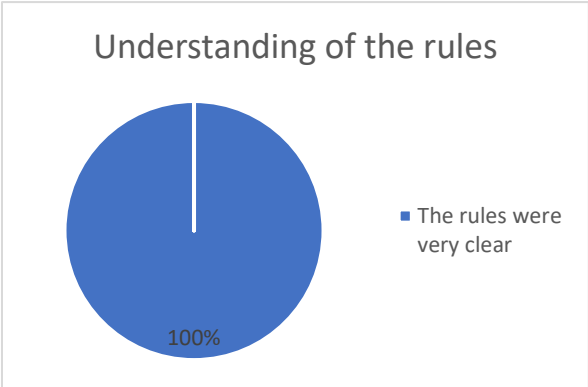


Figure 10 The understanding of the rules in percentages

The rules of the game were understood by all the participants (figure 10) whereas the meaning of the cards was not understood equally by all the respondents (figure 11). From observations it was made clear that most of the children do not read the words on the cards as the cards are put face up on the surface. Furthermore, as with the WASH Quartet, younger children faced more challenges understanding the meanings of the cards than their older counterparts (figure 11). When trying to explain the game it became clear that it was not possible to play with children aged 5 to 7.

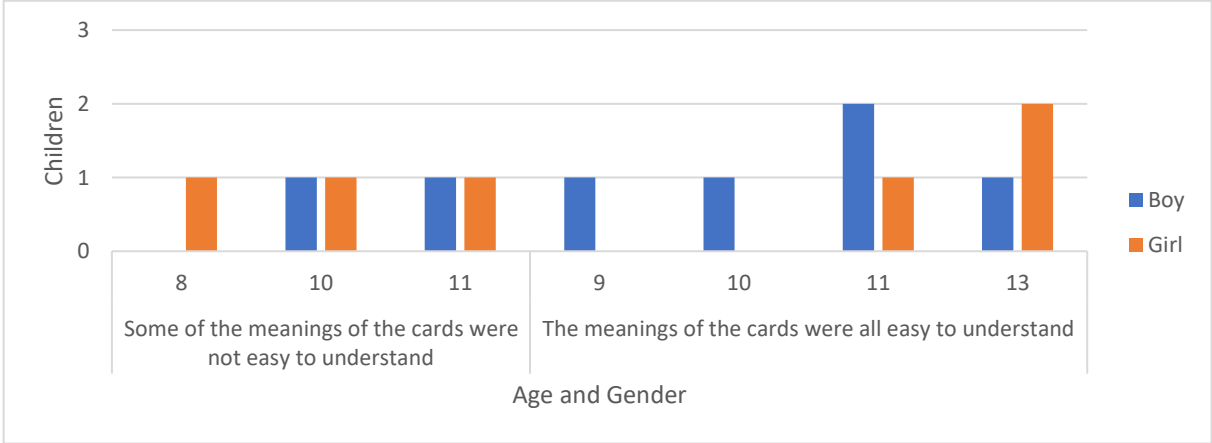


Figure 11 Understanding of the meaning of the cards by age and gender

Therefore, based on the data it can be stated that the minimum age for playing this game in a refugee context like Lesvos is about 8 years old. Three interviewees indicated that they did learn something new from the game (figure 12). The rest of the respondents either did not know or did not learn anything new. The following 'Other' lessons learned were mentioned:

- To practice safe food hygiene (2 participants)
- To keep the toilet clean (1 participant)
- English Words (1 participant)

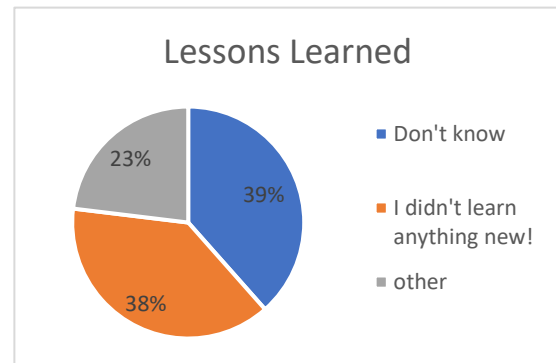


Figure 12 Lessons learned by the participants in percentages

Although most of the respondents were satisfied with the WASH Code Card game, some of them suggested a few changes (figure 10). The most mentioned change was to the icons. Specifically, the girl icon from the category and practice 'Safe drinking water' and the disease prevention icon (2 participants) from the category and practice 'Disease prevention'. Moreover, one of the interviewees suggested changing the colours of the cards, however, the reason for this and the colour to which the participant wanted it to be changed is unknown.

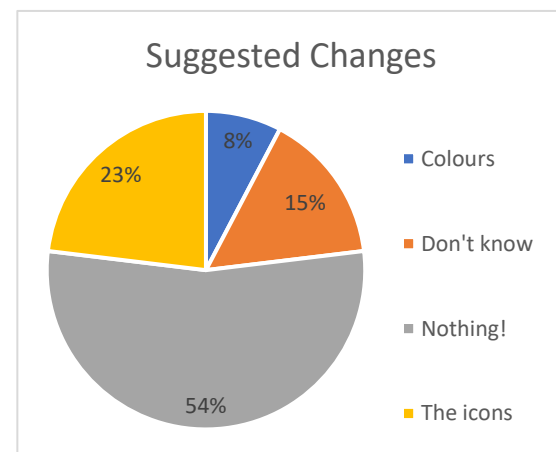


Figure 13 Suggested changes

From the testing it was made clear that children engaged more when playing the WASH Code Cards than the WASH Quartet game. This observation corresponds to the enjoyability of both games as it was higher for the first (92%) than for the second one (80%).

Fly Over

In total 39 children participated in the survey (see Appendix III), of which 61,5% were girls and 38,5% boys. As most of the children attending the EuroRelief school were from Afghanistan, this can also be seen in the high percentage of 87,2% of participants being Afghans. The questions included in this research did not have answers from all the respondents. Some of the children were very young (5-7 years old) and did not fully understand the concept of all the questions so some of them were skipped. In addition it also occurred that the children were not interested in answering the questions and preferred playing outside or other games.

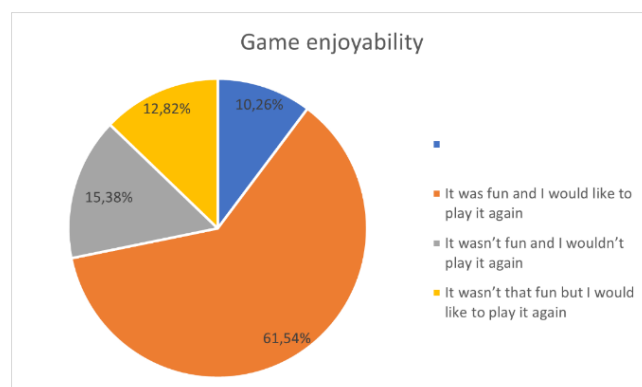


Figure 14 Game enjoyability

Overall, the large majority of the children surveyed really enjoyed the game and were willing to play it again (figure 14). There are some remarks on this finding. First of all, it states that 12,8% of children answered that the game was not that fun but they would like to play it again. Three of these children

actually responded that the game was fun but they would not play it again. To avoid having biased answers, a question on children wanting to play the game again was added. Secondly, 10,3% didn't

respond to the enjoyability question. This was because the question on whether or not they liked the game got added after it was played with them. However, it seemed as if they really liked the game. Most of the respondents responded with positive answers to the question on what they liked about the game.

When asked about what they liked about the game, fifteen children answered mentioning having to choose the right path, having to race against the fly, that the girl can win if they are aware of the key WASH practices and that the game taught them how to keep themselves and their environment clean. The competitive, but still cooperative character of the game helped the players to fully engage in the game which corresponds with the answers given to this question.

Ten children answered the question “What did you not like about playing the Fly Over game”. 20% of these respondents indicated they did not like the fly, but this was mainly focussed on the concept of flies. 10% said that “it was all good”, indicating that this child liked the game. 30% answered with “nothing”. According to these children there was nothing not to like about the game, again indicating that they had no problems. The other 40% answered with “I don’t know”. This can be a result of, for example, them not fully understanding the question, what seemed to happen quite often, or the interviewees not being able to express themselves well enough.

According to the figure about the rules of the game, the children that answered this question often understood the rules very well (see figure 15). The three children that answered with “the rules were a little bit clear” clearly understood the working of the game. As can be seen in the figure, these children were only boys. In general, according to this figure, girls seemed to understand the rules better. For some of the younger children it was more difficult to understand when it was their turn to roll the dice and which stone they had to move.

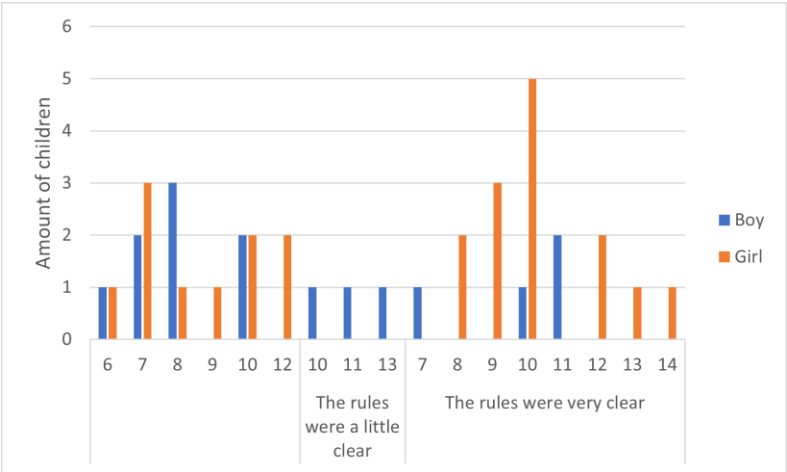


Figure 15 Understanding of the rules

When asked how the participants experienced finding the correct paths in the mazes, they indicated that it was easy. Some of the children said it was a little difficult, and only one child made clear that it was difficult. The interesting thing with this graph (figure 16) is that the children that indicated that it was a little bit more difficult, were not younger than the children that said finding the paths were easy. This could be a result of the game being approachable for children of all age groups. English proficiency is not a necessity for playing this game and finding the paths. When this question was asked, some children pointed out that they could already see the paths. It was noticed that a lot of the children first look at all the paths in the maze, before they pointed out the right icon. They thus first solved the puzzle, without thinking about it and thereby maybe also learning less from it. Therefore, the game was played again with two groups that had already played the game before, but this time some paper covered the mazes. This made children have to had a look at the icons and think on it, before they

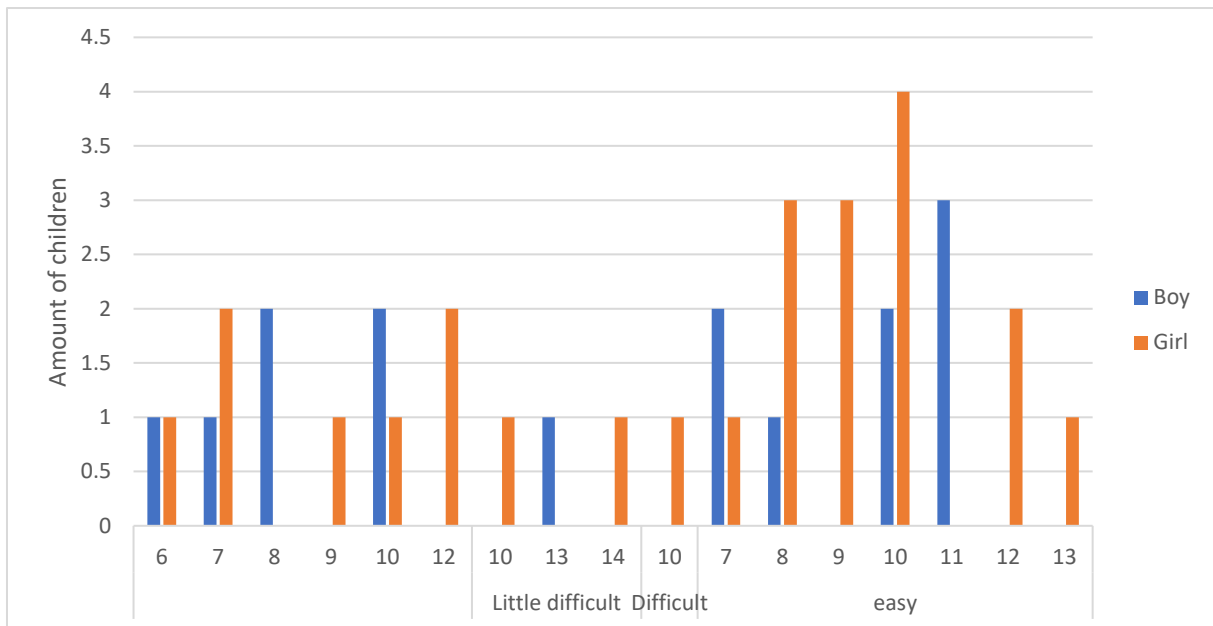


Figure 16 Difficulty finding the right path

could see the paths. This led to a little bit more discussion and doubt before settling with their best choice. One small challenge that arose with this, was that children sometimes forgot which icon they had chosen or got confused with which path belonged to the chosen icon.

Figure 17 shows children's understanding of the meaning of the icons that appear in the board. Most of the children understood what the icons meant. After some discussion about the icons with teachers and students, the following came forward. The 'wash hands' icon, can also be applicable for safe food and safe sanitation, instead of only being used for 'clean hands'. This sometimes led to a little bit of confusion among children. Also, with the icon 'cover food' there sometimes it was confusing for children to understand what this was as inside the camp a different kind of pan is used. The other two icons, toilet and clean cups, appeared to be very clear to them.

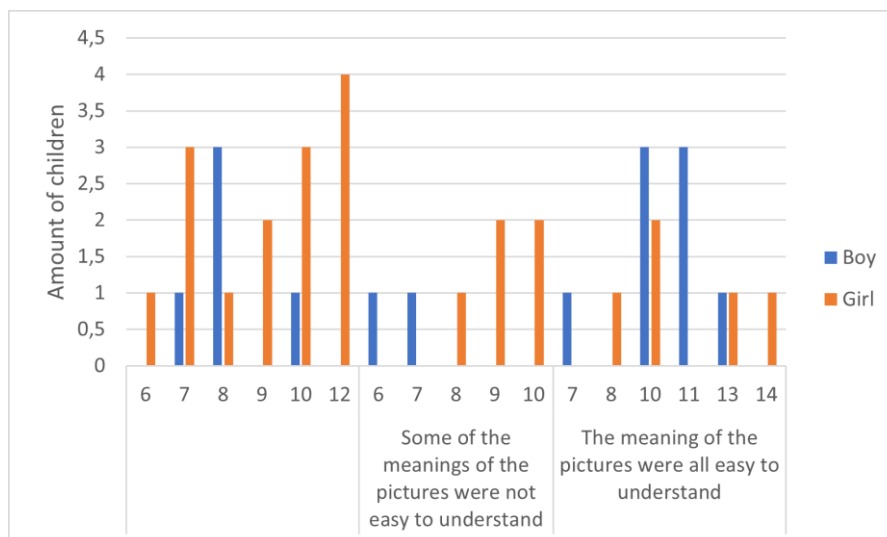


Figure 17 Understanding of the pictures

When the children were asked what lessons they learned from playing the game, only a few answered. One child mentioned washing hands and another child avoiding flies. Two children mentioned a lot of different practices such as safe food, safe drinking water, use of the toilet and washing their hands with soap.

Two of the children suggested changing the icons, which was already discussed previously, and one child suggested changing the toilet into a shower. He preferred having both in the game. Three of the children answered that nothing should be changed.

In general, it seemed as if the children really enjoyed the Fly Over game. They started making buzzing and sad noises when the fly moved forward and very happy noises when the girl moved forward. However, there were two occasions where the game was played with a boy who got more excited when the fly moved forward than when the girl did. This could either be related to the fact that the human was only a girl, or it could be that they just wanted to go against the rules a little bit. Another thing that stood out was that the children often hardly rolled the fly with the dice. During some rounds of the game, the fly was only rolled two times. As a result, the game got less exciting as it became apparent to them that they would win the game.

WASH Mazes

The survey for the WASH Mazes (appendix IV) was carried out with 34 children, both in classrooms and on outreach activities. All three of the mazes have the same concept but the safe food maze appeared to be the easiest to understand as it consisted of clear and recognizable practices. The children knew about COVID-19, which was related to the disease prevention maze, making this one also understandable for them. The safe drinking water maze was the most difficult, as not all concepts were relevant for their situation.

64,7% of the children were girls, 35,3% were boys. Again, the majority of the children were from Afghanistan (88,2%), with a low participation of other nationalities.

The enjoyability of the participants were quite mixed (see figure 18). A large part did like the game. Only a small percentage did not like the game. For the group that did not answer the question, some of the children

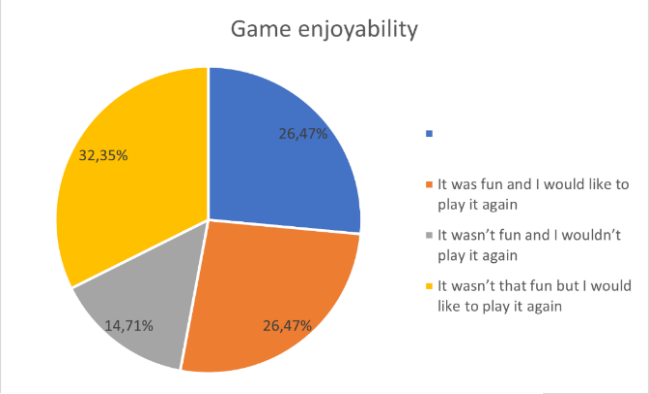


Figure 18 Game enjoyability

liked the game, while others liked it less. There was only one girl who clearly stated that she did not like the game. What is interesting to see for this maze is the enjoyability over age and gender (figure 19). The older children seemed to enjoy the game more than the younger children. This could be related to the level of difficulty of this game. In addition, it seems that there are more girls that do not



Figure 19 Game enjoyability explained

not like the game, the reason for this is unclear. It could be that this again is the result of boys already being more used to going to school. What was observed is that for a lot of children the mazes were not really a game, but more a school assignment. This could be a reason that the enjoyability is lower than for the other games. It can also be seen in figure 20 how clear the rules were. Not many children responded to this question, as this appeared to be a little vague. When being asked if they understood the rules or what they had to do in this game, they either did not understand it or thought they were being asked about the difficulty of finding the practices. However, the older children seemed to better understand the rules. Through observations it was noticed that almost all children understood what they had to do at least partly. The difficulty, however, was the understanding of the cards and concepts.

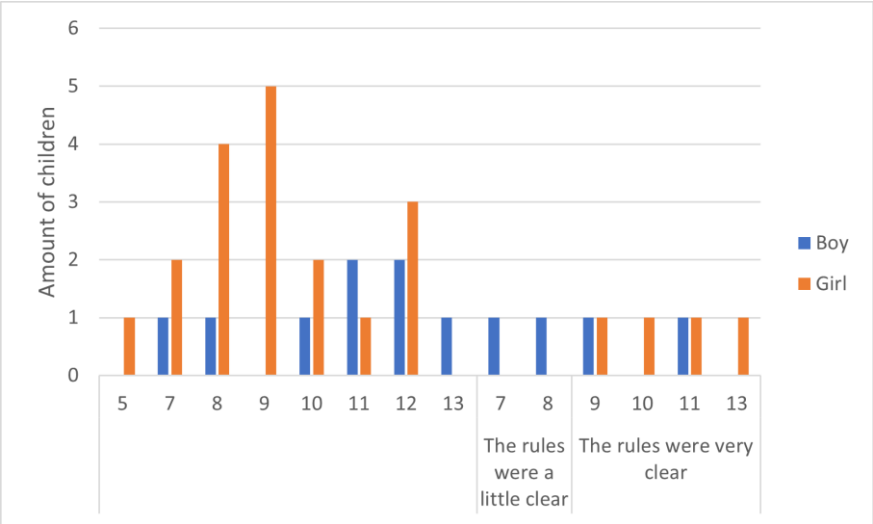


Figure 20 Understanding of the rules

Figure 21 explains the difficulty of finding the right cards. It seems as if this becomes easier when the children get older. The youngest children age 5-7 indicated that it was either difficult or a little bit difficult. From the age of 8 and higher they seemed to find it a little easier. From this figure it can also be seen that mostly girls had trouble in finding the cards, perhaps for the same reasons as discussed before.

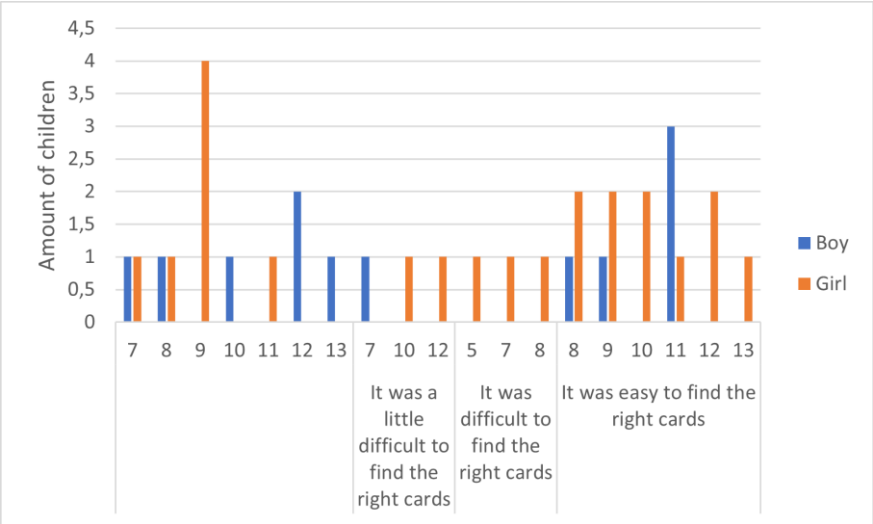


Figure 21 Difficulty of finding the right cards

The level of difficulty of the meanings of the cards can be found in figure 22. Children of all ages and gender have different opinions on the level of difficulty of the cards. This could be related to the English proficiency of the children and whether or not they had incorporated some of the practices already.

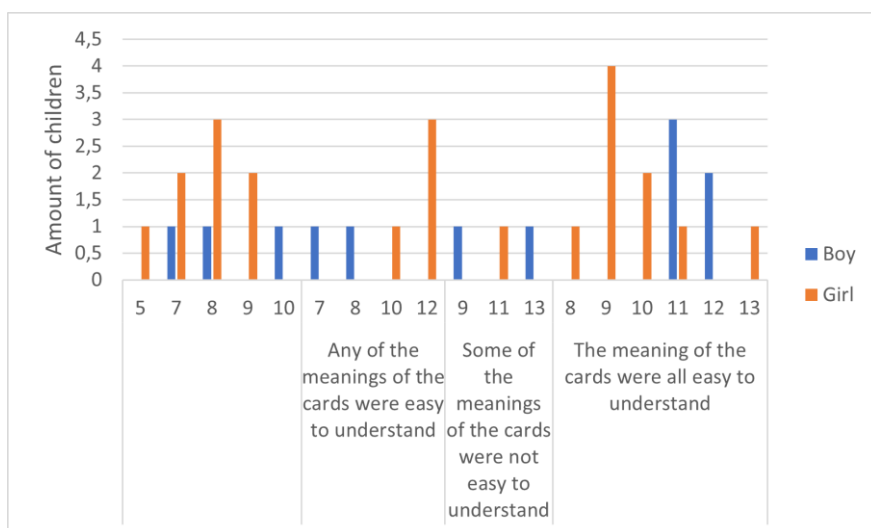


Figure 22 Understanding of the cards

When being asked about the lessons they had learned from this game, most children answered washing their hands at critical times and practicing safe food hygiene. These were both involved in the maze about safe food, which was played by the most children. This one also seemed to be the one they understood the most and washing your hands is a very common and understandable concept. A few children also answered with avoiding spreading diseases and drinking safe water.

The children indicated that nothing needed to be changed from the game. With observations and conversations with teachers, however, it turned out that some things could be adapted. For example, the WASH maze about safe drinking water was the most difficult and not very suitable to the situation inside the camp as the water challenges tend to be different to the ones happening in other place with diverse services. Another key issue is is that sometimes it was considered very difficult to see which practices were the right ones as they are all right actions in one way or another.

Some general observations were that the children got really excited about the card saying “no poo on the streets”. This spoke to their imagination and they understood why they should not do that. It really got their attention, one child even mentioned it when answering the question what was learned from the game. Another good thing was that the children often understood the concept of the game much better when they started the second maze. When looking at the cards they pointed to cards they considered as right sooner than with the first one. The concept of bacteria and viruses, what they are and why they make them sick, was sometimes very difficult to understand for the children. Especially if they were really young. However, when talking about COVID-19 they often understood it better. Finally, if the English of the children is very proficient, which often also means that the children already are a little bit older, the game can get very easy.

From the testing it seemed as if the children were more engaged in the Fly Over game than in the WASH Mazes. This can also be seen in the percentages of the enjoyability, with 61,5% indicating they liked the Fly Over game and 26,5% for the WASH Mazes. However, it is difficult to say that these percentages are fully correct, due to the blank answers that are not involved in this.

Recommendations

Opportunities

In general, the games can be a contribution to each other. The WASH Mazes and Fly Over games can form the basis in knowledge for the Quartet and Code Cards. As the first two games are more descriptive in what the practices entail, they can make a good start in getting the children acquainted with the topic of WASH and the practices that belong to it. With the latter two games using the same icons and language, it can be a nice follow-up on the knowledge previously gained. It provides an approach in which they have to take more initiative and put their thoughts into practice. This is also very helpful to deal with different levels in English and age groups. There are multiple games that should be suitable for all the children present in the school system. As the games build on the same topics, some of the recommendations are combined.

The humanitarian context, based on the experience from the Mavrovouni refugee camp, brings some good opportunities for educational games to be played in this setting.

The first one is the opportunity to learn. In every refugee camp multiple educational activities are carried out. As mentioned, there are various organisations offering all kinds of school programs where children learn various topics. Furthermore, WASH is a relevant topic which has been incorporated into the new school curriculum and there are several educational programs giving specific attention to WASH education.

Something that was noted for the games is that children in general had a hard time understanding the purpose of the game. Although the games have only been played two times with most of the respondents, an option would be to incorporate these games into a lesson plan, something that was also suggested by EuroRelief teachers. Lesson plans can introduce different WASH subjects and the games can function as a method for practice and reinforcement.

Furthermore, WASH games can not only be incorporated in school programs but also in outreach activities aimed at raising awareness about hygiene matters. During the interviews conducted, it became clear that multiple activities around hygiene promotion were taking place not only in schools but also in outreach activities. These are mostly door-to-door activities where the people listen to a lesson on hygiene or receive a flyer with related information. During these activities, games can foster conversation and a more effective transmission of key messages. This can also be combined with the outreach program of the schools, for example the one from EuroRelief. When they visit the houses for educational purposes, this could be combined with a lesson or games about hygiene practices.

An important factor of the opportunity to learn is inclusivity. Discrimination still occurs inside the camp, with the presence of many different nationalities, cultures and skin colours. This discrimination is most obvious with adults, who can get into fights or intense discussions. However, this behaviour was also noticed in some of the children. Two Afghan girls refused to join a game in a classroom because next to some Afghan children, two Syrian boys were also playing the game. This is something that is important to keep in mind. The games should be as inclusive as possible, especially since it is very easy for children to speak with others in their own language, leaving children with other backgrounds behind. A simple way in making sure the games are inclusive is by ensuring the icons include people from all genders and with all skin colours.

And, the second opportunity is the chance to play. Playing tends to build a fun, comfortable and relaxed space for learning as it allows players to interact with each other; it tends to be less tedious than listening to a lesson, especially for children who are dealing with trauma and whose concentration and focus levels tend to be low or diminish considerably during the day. It seemed as if the children

especially, but also adults, preferred playing games over listening to a lesson. This is something that could be observed in the classrooms, where the teachers used a lot of games or interactive methods, like flashcards or memory, to keep the attention of the students. During the outreach it could also be noticed that adults sometimes wanted to join the games that teachers played with the children. This provides a lot of opportunities for the parents as well. They can participate, which increases their knowledge in English and the topics covered. However, it can also improve the bond between the children and their parents, when parents are encouraged to join educating their own children. This is something the teachers of EuroRelief are trying to incorporate during outreach activities, especially since due to traumatic events the bond between parents and their children can be a little troubled. Furthermore, games are especially welcome in an environment such as a refugee camp where distraction and entertainment tend to be very limited. Playing games can help children to forget at least for some time of the difficult situations that they are living.

Games improvement

Rules and Gameplay

Based on the surveys and observations for the WASH Code Cards, it is only suggested to change the minimum age to 8 years old. No other changes to the rules should be made as the rules were found clear by most of the respondents. For the WASH Quartet, however, this was different. To solve this, there are a few possibilities to think of explained below.

The first possibility is to change the rules of the game by removing the name of the practices so the name of the main categories would only remain. Therefore, the players would only have to ask for the different categories and not for any specific card. It is suggested for this option to add at least one or two more categories to make the game more entertaining. Another option is to follow the concept of the Go Fish card game where players make sets of two cards instead of four. With this option, players would just have pairs of practices or behaviours. It is also possible to play the game 'memory', something suitable for young kids who do not read.

The second possibility for adaptation of the WASH Quartet is to simplify the words. This adaptation is based on the observation that children described the icons instead of reading the words that appear on the cards. Although describing the practices found in the icons can have a positive impact on the understanding, it is recommended that children read the words aloud to prevent miscommunication.

Lastly, as also suggested for the WASH Code Cards, it is suggested to change the minimum age to play the WASH Quartet from 7 years old to 8 years old.

The data from the WASH Mazes and the Fly Over game suggested that no modifications should be done. It seems that most of the children understand the rules of the games. The challenge lies in the age and the understanding of the concept of the game in general. Some children were too young to fully understand and enjoy the games, or their English was not proficient making communication about this quite difficult. For the Fly Over it is suggested to keep the age at 7+. For the WASH Mazes the age suggested would be 9-12. It could also become 6-8 when some suggestion mentioned below are incorporated.

The WASH Mazes appeared to be experienced more as a school assignment than a game. It is therefore suggested to use this game more within the school curriculum and the other games also as games to play outside of the classrooms.

Categories and Activities/Practices

Not all categories are as relevant as other categories when looking at the situation inside the Mavrovouni camp. Observations and conversations made clear that many children, especially those

from an Islamic culture, know already quite a lot about the WASH topics covered by the games. Although sometimes actions did not live up to the goal of the awareness that was attempted to be raised, for example, in some occasions children would not cover their coughs and sneezes or would use their hands instead of their elbows, while they reported that they were carrying out the practice as stated in the games.

For the WASH Quartet as well as for the WASH Code Cards, it is not suggested to remove categories because they are unrelated, but rather look if they are a good match for the purpose of reinforcement. It is important to see whether all categories contribute to strengthening the knowledge that kids already have. The category that does not really fit to this criterion is the category 'Health' as it is more a summary of all the other categories. It is recommended to remove this category from the game, which would solve the problem of having overlapping practices that confused children when asking for a specific card.

For the WASH Code Cards, for each category one action was taken out when the game was designed. This was decided at first hand just to test the game with three practices instead of four. It appeared that having three practices worked better for the game. The actions that were taken out were considered the least important in that moment. Because it was a quick decision without good reasoning the game needs a thorough revision with a better substantiation. Appendix VI shows which practices have been removed for the first adaption.

With these two games some confusion can arise as a result of double practices. For different categories it happens that the same practices with the same icons are used. This makes it difficult to see the differences between the cards.

The Fly Over game focusses on four hygiene practices, with one matching icon. The categories appear to be well chosen. They are relevant for the situation inside the camp and apply for the actions carried out by the children. However, the categories can sometimes be related to each other, leading to some confusion when choosing the right icon. This, for example, happens with the 'wash hands' icon, which is suitable for 'clean hands' and 'safe food'. Still it is suggested not to change these, as they are both very important and the children will have to choose the most relevant icon for the practice.

The WASH Mazes consists of the three different sheets. As is mentioned in the key findings, the maze about food safety and disease prevention are very accurate. However, the topic of safe drinking water is important, but less relevant. It could be used inside the camp, but then it is recommended to make some changes to the icons. For some children, especially the younger ones, it was quite difficult to understand which exact cards were the right one for the topic of that maze, as all practices are correct in one way or another. An example of this would be the card 'throw waste in bin' in the food maze, as this is about food as well – or at least it is in the picture – and can be done after the cooking, but this is not one of the correct cards. One suggestion would therefore be to make more distinctions between right and wrong cards. This could either be done by choosing other cards with very different topics, so not as with the example just mentioned. Another way would be to have cards with the opposite practices. An example of this could be 'leave waste on streets'. The latter example would be more suitable for the younger children with a less proficient level of English (age 6-8). It will get too easy for the older children with a higher proficiency. For the older children (age 9-12) it is suggested to either leave the game as it is, or to use the first suggestion.

Language

The difficulty to understand English was one of the main barriers to play and enjoy the WaSH Quartet. Considering the international background of the refugee camp, English is the most convenient

language to play games, especially when the games would be incorporated in a lesson plan. In the case of not changing the language to another one, it is best to simplify the English words based on the difficulties that children may have to pronounce them. Appendix V shows messages that can be considered for revision. Important to note that these changes are partly based on the feedback of a teacher with nine months of experience in teaching children in the refugee camp. Simplifying some of the words should not mean that the hygiene messages are completely gone, but just be made easier to understand by children whose native language is not English. Changing the English words to easier ones, may make the game more accessible for younger children to play it. Learning English and playing games go hand in hand in the refugee camp. Learning these words in English enhances the understanding of the topic because it makes children think further about it and can also encourage deeper conversations.

Another argument in favour of simplifying the English words relates to time management, especially relevant in the case of the WaSH Quartet. The game should not take too long as many children lose their concentration easily; this has been in part related to trauma. If the words used to describe the practices are simplified, children might struggle less while reading and pronouncing them. Therefore, if the gameplay takes less time, it can keep the game going and prevent children from losing focus.

For the Code Cards, it is possible to think about removing the words as they are often not used by the children. However, the words do not hinder the gameplay. It might be a good option to add the simplified words on the cards together with the images as some kids can read the words.

For the WASH Mazes, the same problems arose as were mentioned above. Some messages were a little too long or complicated. Especially in the maze about disease prevention, where longer messages and difficult words were used. For the maze about food, an improvement should be made for the message 'Cover the food to protect it from the flies'. It could be shortened to 'Cover the food', but then it leaves out the important part of the flies.

With regard to the Fly Over game, only little changes in the messages are needed as they already are concise and, for the most part, easy to understand. The only adaptations that could be suggested would be 'treat water', as the concept of treating water can be vague and unfamiliar. It could either be changed in "make water clean" or "clean water", or the icon could be replaced which will be discussed in a little bit. Also, the word sanitation is too difficult. This could be changed to toilets.

When the games are translated to Farsi, French or Somali, simplification of the words would probably not be necessary as they will understand better in their own language. It is suggested that translated versions are used if children speaking the same language play the game together and have a facilitator of that same nationality. As the games will most of the time be played in a school setting where teachers and students are from different nationalities, it is suggested to prioritise the simplification of the words rather than translating the games into other languages.

Icons

The icons of the four games mostly overlap. Therefore the evaluation is combined. In general, the icons got positive responses about the looks and comprehensibility. However, some need to fit the local context better. A few icons were selected for modification:

Protect water source: On the cards and maze of the category *Safe Drinking Water*, the icon of the practice 'Protect water source' needs to be modified. The card shows a pond with a fence surrounding it, but in the camp there are no open water bodies. The proposed icon is one of a WASHpad (figure 23). This is the place where water can be tapped for washing hands, washing dishes, or doing laundry, a common water source in the camp.

Treat water: In the maze about *Safe Drinking Water*, the icon of ‘treat water’ is not relevant for the situation inside the camp. The people drink from water bottles that are either distributed, or purchased from the supermarket. This water is already clean and does not need to be treated. It could therefore be removed from this WASH maze. For the Fly Over game, it is suggested to replace this icon with another one. The most suitable would be the icon ‘use clean cups’, which depicts a clean cup filled with clean water.



Figure 23 WASHpads in camp Mavrovouni (Watershed, 2022)

Wash hands before eating: On the cards of the category *Health* and *Safe Food*, in the maze about *safe food* and in the Fly Over game, the icons of ‘Safe food’ need

adaptions, also the icon of the practice ‘Wash hands before eating’ on the cards of the category *Clean Hands* The cards currently display a boy eating pancakes with a fork.

1. The cultures that are present in the camp rarely eat with a fork. They mostly eat with their hands or using a spoon. The proposed change is having a boy or a girl with a spoon or just using his/her hand instead as in the icon used in the WASH Quartet game version played in Ethiopia.
2. Regarding the food showed, people in the camp do not usually eat pancakes but mostly consume flatbread, rice, chicken, or potatoes with some sauce. The pancakes should be replaced with another staple food they can relate better to.

Clean hands: The icon ‘clean hands’ in the Fly Over game was not very clear. It is difficult to see what the crosses on the hands are, whether they are dirty or depict the cleanness. As the sentence saying “clean hands” indicate that the hands should be clean, it is suggested to replace the crosses with white diamonds that often represent cleanness of things.

Cover the food to protect it from the flies: In the maze about food safety and in the Fly Over game, the icon “cover the food to protect it from the flies” raised confusion, as the icon seemed to be unfamiliar to the children. In the camp they often use a black electrical pan, as in the figure on the right, which comes with a lid. It is suggested to change the tajine in such a pan. The lid on it still suggests that players should cover the food.



Figure 24 Electrical pan (Bol.com, 2022)

Disease prevention: the virus icon was often considered scary and evil by the children interviewed, so the image might not be appropriate for a game for a refugee context. Therefore, it is proposed to choose a different picture which is less scary. A proposed modification to the image is to change the angry faces of the viruses to neutral faces.

Girl: On several cards appears the icon of a girl. One boy pointed out that he did not like the icon of the girl in the category *Safe Drinking Water*. Considering his nationality (Congolese), it would be good to take the multicultural environment of the refugee camp into account and show girls and boys with different skin colours. This can encourage children to see others with a different skin colour in the camp as equals.

Visualisation

First, for the WaSH quartet not much needs to change. The cards are a bit large to hold for the children. However, changing the size might have an influence on the visibility of the words and the icons. Therefore it is suggested to make the cards smaller only if it doesn't affect the readability of the words and visibility of the icons.

However, for the WASH Code Cards it is something different. For this game it would be better to change the shape to a square instead of staying with the rectangle. It is not necessary to hold the cards in your hands as the cards are all on the table. Changing the shape is purely for the space the cards take up. Also it looks better to have a square when the cards are on the table.

As for the Fly Over game, some adaptations could be made. As discussed in the key findings, the game got less exciting due to the ratio of person and fly (4:2) being out of balance. A suggestion to improve this would be to make the amounts of flies equal to the number of humans displayed. However, if this is done, the number of steps for the fly to reach the finish line should also be increased to make the chances equal. It might also be good to make the number of steps for the fly slightly higher than for the person, as there is the possibility that the participants do not find the right icons in one guess, delaying the journey. For the children it works motivating if the game is exciting, but they still have a good chance for winning the game.

Another finding that stood out was some boys cheered for the fly instead of the girl. This didn't encourage the negative connotation that wanted to be given to the fly as a vector transmitting diseases. If this was indeed caused by the fact that there were only girls on the dice, a solution would be to make the number of boys and girls on the dice equal. As there would only be three characters on the dice, then humans and flies would be balanced, but it is difficult to make the number of boys and girls equal. It is therefore suggested to make icons that include two humans, one boy and one girl. It would then be preferable to use a slightly bigger dice, making the icons bigger and more visible. If this was not caused by a only girl being depicted on the dice, it is suggested to make the connotation about the fly stronger. This can for example be done by giving the flies depicted on the board more angry faces.

Furthermore, one more suggestion for the Fly Over is to enlarge the icons in the board, making them easier to be read. While testing, the small size of the icons caused some confusion, especially with the 'safe food' and 'clean hands' icon. In those icons there is a lot depicted on a small icon, making it difficult to see what is in the icon.

In addition, a word like "flies!" could be added in all languages (incl. Afghan, Somali, Arabic and French), to make sure everyone feels included.

Regarding the WASH Mazes, it is suggested to change the size of the sheets. The cards are very small, but if the entire paper could be a little bigger, the words on the cards are easier to read and some of the icons would be a little clearer. This might also support the teachers to keep the mazes on the walls of the classrooms to promote the messages about good hygiene practices, as they are now a little bit easier to read and see from a small distance.

Work plan

In order to use the games in the Mavrovouni camp, the recommendations mentioned above might be helpful. The first step to continue from where the games are now, would therefore be to incorporate the recommendations and make them suitable for the local situation. When this is done, contact could be made with organisations inside the camp. There are various organisations offering all kinds of school programs. As the game testing process was done with EuroRelief, they already know about the working of this game, what could make it easier to use them in their school curriculum. However, this also means that a lot of their students already played these games. It is therefore suggested to also get in touch with other NGOs, like Metadrasi and UNICEF. As some of these organisations are also active in the camps on the islands of Chios and Samos, it might also be possible to get it to those places. For the children to better understand the games, it is important that they are incorporated in the curriculum of the school. It is therefore suggested to discuss the possibilities for a lesson plan about the topic of WASH. For the EuroRelief school, the focus is to learn English and they have new topics every week. It would therefore be possible to design a one-week program in which the words that belong to the game are discussed or to see if they already have such a lesson plan. After they have finished this lesson plan, they can still keep the games to play them more often with the children. If the organisations agree to use the games and a lesson plan, everything can be printed and send to them. By asking the teachers for curriculum feedback, which they often already do for their regular curriculums, further improvements can be made and it can be checked if the given recommendations were indeed helpful.

Conclusion

This case study aimed to investigate whether the four games were suitable for the situation of the Mavrovouni refugee camp on Lesbos. With the camp being an emergency setting and constructed as a temporary environment, a lot of WASH related problems have occurred over time. In order to raise awareness with the children about these WASH practices, the games included in this research can be used. Based on the studies performed it can be said that in general all the games got a lot of positive responses after being tested during school classes and outreach. A large percentage of the children enjoyed the games and the teachers agreed with the purposes of the games, as they were educational and helpful for the children. The WASH Quartet and Code Cards games got the highest percentage of enjoyability of 80% and 92%, with no one indicating they did not like the game at all. For the Fly Over this was a little bit lower with 61,5% and for the WASH Mazes it was 26,5%, leaving out the blank answers for both. Still, for the last two games high percentages indicated that the participants liked it at least a little bit. For all the games the rules of the games were clear, although this was the most difficult for the WASH Quartet. The level of difficulty differed a for each game, which is also caused by the suggested age groups for which the games are suitable and the English proficiency which is often related to this. The WASH Quartet and Code Cards are for older children, from 8 years and older. When played with children of those ages, the games were a little difficult, but this got less when children were older. With both games it could be observed that boys understood the games better than girls, which can be a result of multiple factors as, for example, that boys are already more used to going to school. However, these causes are still guesses. For the Fly Over and WASH Mazes, the level of difficulty differed a lot as they were played with a broad range of ages (5-14 years). Again, it was noticeable that the younger children had more struggles with the game than the older ones. Especially the mazes were more difficult for the younger children. Therefore the suggestion was made in two different ways, to make it suitable for two different age groups.

The results of the surveys, observations and interviews with the teachers led to recommendations for the games. The icons and language used were almost the same for all of the games. The recommendations were mainly about how to make the icons more suitable to the situation inside the camp. For the language it was mostly about shortening the messages to make them easier to understand for the children.

As the games enhance each other through the way they work and the different levels of using the WASH practices, it can be a useful way to make sure all the children with all the levels and ages can be included in the learning process. In addition, the games can be played as follow-ups from each other, demanding more knowledge and initiative from the players as their knowledge about WASH and English increases.

Some struggles appeared while testing the games, making the process more difficult. These were mainly related to language, trauma and culture. These are important factors to keep in mind when going to a setting like this. In order to make everyone feel included, the games should be approachable for everyone from the given age group. Inclusivity of nationality should also be kept in mind to prevent discrimination from happening.

As this research is about how to adapt the games to make them suitable for the setting of the Mavrovouni camp, the games can now be adapted to the local situation based on the recommendations. By working together with local NGOs, possibilities might arise to incorporate the WASH games in the school curriculum, which could also be combined with designing a lesson plan on these topics. After this is done, more research could be helpful to measure to what extent the education through the games has contributed to changes in practices.

With the help of these games more awareness can be created for the children. Through the children also adults can be reached, as they sometimes participate during outreach and when children start using the practices in their daily life, their parents also get acquainted with them. Even though they may experience problems related to WASH, the children will have a better understanding on how to protect themselves and to prevent becoming sick.

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Appendix

Appendix I

Children Consent Form

We are asking that your child/student takes part in a research study carried out by Ms. _____ at MetaMeta Research, Netherlands.

If you choose to allow your child/student to be in the study, the child will complete the survey. The survey will contain questions about how the child found playing the _____ game and about his/her water, sanitation and hygiene practices.

This research study is voluntary. The child can skip questions that he/she does not want to answer or stop the survey at any time. The survey is also anonymous and confidential.

By signing this form, you agree that your child/student may participate in this research study.

Full Name:

Date:

Child's Name:

Typing his or her name and the date below represents your child's signature affirming that this research has been explained to him or her and that he or she agrees to participate.

Minor's name:

Date:

Please contact Ms. Florencia Rieiro at frieiro@metameta.nl for questions related to the research.

Appendix II

Questionnaire WASH Code Cards and Quartet

Answering this form is voluntary! Answers are anonymous and confidential.

Age:

Gender:

Nationality:

Language in which the WASH Code cards/Quartet game was played:

If played in more than one language: Which language did you find the most suitable to play the game?

- 1. How was playing the game for you?**
 - a) It was fun and I would like to play it again
 - b) It wasn't that fun but I would like to play it again
 - c) It wasn't fun and I wouldn't play it again
- 2. Were the rules of the game clear?**
 - a) The rules were very clear
 - b) The rules were somewhat clear
 - c) The rules were not clear at all
- 3. Overall, would you say that...?**
 - a) The cards were all easy to understand
 - b) Some of the cards were easy to understand
 - c) The cards were not easy to understand
- 4) What water, sanitation and hygiene lessons did you learn mostly from the game? (Don't show the answers to the respondent, let him/her tell you. More than one answer can be chosen)**
 - a) To drink safe water
 - b) To practice safe food hygiene
 - c) To avoid spreading diseases
 - d) To use the toilet
 - e) To avoid flies
 - f) To keep myself healthy
 - g) To keep my baby healthy
 - h) To wash hands
 - i) Other (please specify)
 - j) I didn't learn anything
 - k) I don't know
- 5. Is there something you would want to change about the game?**
 - a) The rules
 - b) The cards
 - c) The icons
 - d) Make the game more difficult
 - e) Make the game easier
 - f) Add topics/categories (please specify)
 - g) Remove topics/categories (please specify)
 - h) Other (please specify)
 - i) Nothing!
 - j) I don't know

Appendix III

Questionnaire Fly Over game

Answers will be kept anonymous and confidential.

Age:

Gender:

Nationality:

Language in which the Fly Over game was played:

If played in more than one language: Which language did you find the most suitable to play the game?

- 1. How was playing the game for you?**
 - a. It was fun and I would like to play it again
 - b. It wasn't that fun but I would like to play it again
 - c. It wasn't fun and I wouldn't play it again
- 2. What did you like about playing the Fly Over game?**
- 3. What didn't you like about playing the game?**
- 4. Were the rules of the game clear?**
 - a. The rules were very clear
 - b. The rules were a little clear
 - c. The rules were not clear
- 5. How did you find searching for the correct paths that approached you to the finish line?**
 - a. It was easy to find the correct path
 - b. It was a little difficult to find the correct path
 - c. It was difficult to find the correct path
- 6. Overall, would you say that...?**
 - a. The meaning of the pictures were all easy to understand
 - b. Some of the meanings of the pictures were not easy to understand
 - c. Any of the meanings of the pictures were easy to understand
- 7. What WASH practices did you learn mostly from the game? Hint: *Don't read the options aloud. Let the respondent tell you. More than one answer can be chosen.**
 - a. To drink safe water
 - b. To use the toilet
 - c. To wash hands at critical times
 - d. To wash hands when caregiving
 - e. To practice safe food hygiene
 - f. To avoid flies
 - g. Other (please specify)
 - h. I didn't learn anything new!
 - i. Don't know
- 8. Is there something you would want to change about the game?**
 - a. The rules
 - b. The icons
 - c. Make the game more difficult
 - d. Make the game easier
 - e. Add topics/categories (please specify)
 - f. Remove some topics/categories (please specify)
 - g. Other (please specify)
 - h. Nothing!
 - i. Don't know

Appendix IV

Questionnaire WASH Maze

Answers will be kept anonymous and confidential.

Age:

Gender:

Nationality:

Language in which the Fly Over game was played:

If played in more than one language: Which language did you find the most suitable to play the game?

- 1. How was playing the game for you?**
 - a. It was fun and I would like to play it again
 - b. It wasn't that fun but I would like to play it again
 - c. It wasn't fun and I wouldn't play it again
- 2. What did you like about playing the WASH Maze game?**
- 3. What didn't you like about playing the game?**
- 4. Were the rules of the game clear?**
 - a. The rules were very clear
 - b. The rules were a little clear
 - c. The rules were not clear
- 5. How did you find having to choose the right cards?**
 - a. It was easy to find the right cards
 - b. It was a little difficult to find the right cards
 - c. It was difficult to find the right cards
- 6. Overall, would you say that...?**
 - a. The meaning of the cards were all easy to understand
 - b. Some of the meanings of the cards were not easy to understand
 - c. Any of the meanings of the cards were easy to understand
- 7. What WASH practices did you learn mostly from the game? Hint: *Don't read the options aloud. Let the respondent tell you. More than one answer can be chosen.**
 - a. To drink safe water
 - b. To use the toilet
 - c. To wash hands at critical times
 - d. To wash hands when caregiving
 - e. To practice safe food hygiene
 - f. To avoid flies
 - g. Other (please specify)
 - h. I didn't learn anything new!
 - i. Don't know
- 8. Is there something you would want to change about the game?**
 - a. The rules
 - b. The icons
 - c. Make the game more difficult
 - d. Make the game easier
 - e. Add topics/categories (please specify)
 - f. Remove some topics/categories (please specify)
 - g. Other (please specify)
 - h. Nothing!
 - i. Don't know

Appendix V

There are some words that are hard to pronounce and words the children are not familiar with. The next list contains all words used in the game. For some words a suggested change is written in the table. In general it is better to make the words as short as possible. A maximum of three words would be good. If it cannot be prevented, four words are also possible.

Current version	Adapted version	Difficult words	Notes
Unhappy flies	Angry fly/Sad fly	Unhappy	
Clean toilets	Clean toilet		
Waste in bins	Waste in bin		
Cover the food	Cover the food		
No poo on streets	No poo on street		
Health	?		Think about adaption Remove and replace
Safe drinking water	Drink safe water		Remove
Safe sanitation	?		Think about adaption Remove
Disease prevention	No illness		Remove
Safe food	Safe food		Remove
Safe sanitation	?	Sanitation	Think about adaption
Tell: sanitation is important	?	Sanitation	Think about adaption
Use toilets properly	Pee and poo in toilet	Properly	
Clean toilets	Clean toilet		
No poo on streets	No poo on streets		Remove(double practice) and replace
Safe food	Safe food		
Wash vegetables	Wash vegetables		
Cook the food	Cook the food		
Cover the food	Cover the food		
Wash hands before cooking	Wash hands before cooking		
Safe drinking water	Safe water	Drinking	
Store water safely	Close water bottle	Safely	
Protect water source	Clean WASHpad		
Treat water	Treat water		
Use clean cups	Use clean cups		
Disease prevention	No illness		
Wash hands with soap	Wash hands with soap		
Avoid crowded places	Avoid busy places	Avoid, crowded	
Cover your coughs and sneezes	Cough in elbow	Cover, coughs, sneezes	
Do not touch mouth and eyes	?		Think about adaption
Clean hands	Clean hands		
Wash hands before eating	Wash hands before food	Eating	
Use water and soap	Wash hands with soap		
Tell friends: wash hands	Tell: wash hands		
Wash hands after toilet	Wash hands after toilet		

Appendix VI

Category	Removed action
Unhappy flies	No poo on streets
Health	<i>Removed entirely</i>
Safe sanitation	Tell: sanitation is important
Safe food	Cook the food
Safe drinking water	Treat water
Disease prevention	Avoid crowded places
Clean hands	Tell friends wash hands